

DESIGN DATA			
Traffic	Average Daily		
Current	Pass: 4,575	Trucks: 1,365	Total: 5,940
Preventative Maintenance			

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SIM-8-029(137)100	18990	1	1

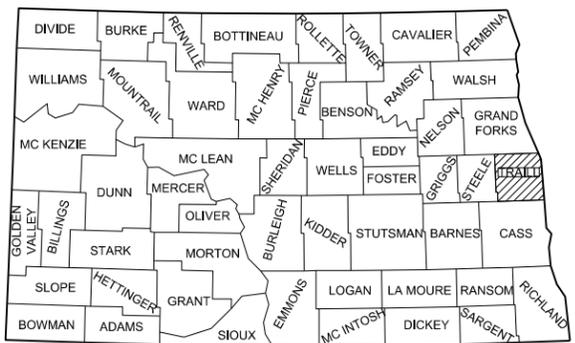
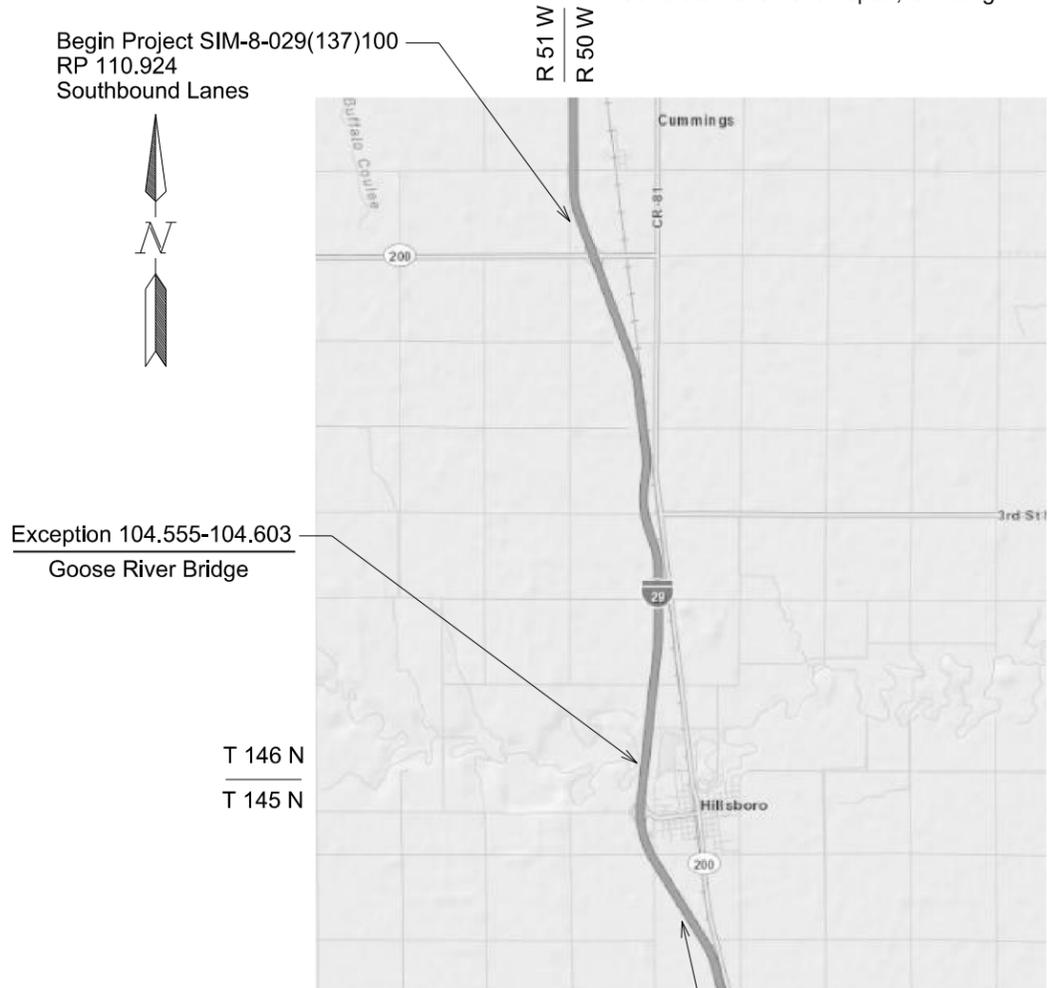
JOB # 26 NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

SIM-8-029(137)100
Traill County
Interstate 29 Southbound from
Highway 200 to Hillsboro
Concrete Pavement Repair, Grinding

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota Department of Transportation October 2008; Standard Drawings currently in effect; and other Contract Provisions submitted herein.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SIM-8-029(137)100	10.502	10.550



End Project SIM-8-029(137)100
RP 100.243
Southbound Lanes

DESIGNERS
Justin Oss

APPROVED DATE 11/25/13
Kevin Gorder
FARGO DISTRICT
ND DEPARTMENT OF TRANSPORTATION

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 11/25/2013
Justin Oss
Fargo District

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-8-029(137)100	2	1

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11	1-25	Data Tables (Concrete Pavement Repair Locations)
20	1-7	General Details
30	1	Typical Sections
100	1-2	Work Zone Traffic Control

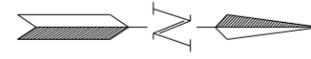
LIST OF STANDARD DRAWINGS

<u>Standard No.</u>	<u>Description</u>
D-20-01	NDDOT Abbreviations
D-20-02	NDDOT Abbreviations
D-20-03	NDDOT Abbreviations
D-20-10	NDDOT Utility Company Abbreviations
D-20-20	Linestyles
D-20-21	Linestyles
D-20-30	Symbols
D-20-31	Symbols
D-20-32	Symbols
D-550-2	Longitudinal Joint Details
D-550-3	Transverse Contraction Joint Details
D-550-4	Transverse Expansion Joint Detail
D-704-5	Contractor Sign Detail
D-704-7	Breakaway System for Construction Zone Signs
D-704-8	Breakaway System for Construction Zone Signs
D-704-9, 10, 11, 12	Construction Sign Details
D-704-13	Barricade Details
D-704-14	Construction Sign and Barricade Assembly Details
D-704-15	Construction Sign and Barricade Location Details
D-704-35	Sign Layout for One Lane Closure – Interstate System
D-762-02	Interstate Pavement Marking 4 Lane Divided Highway

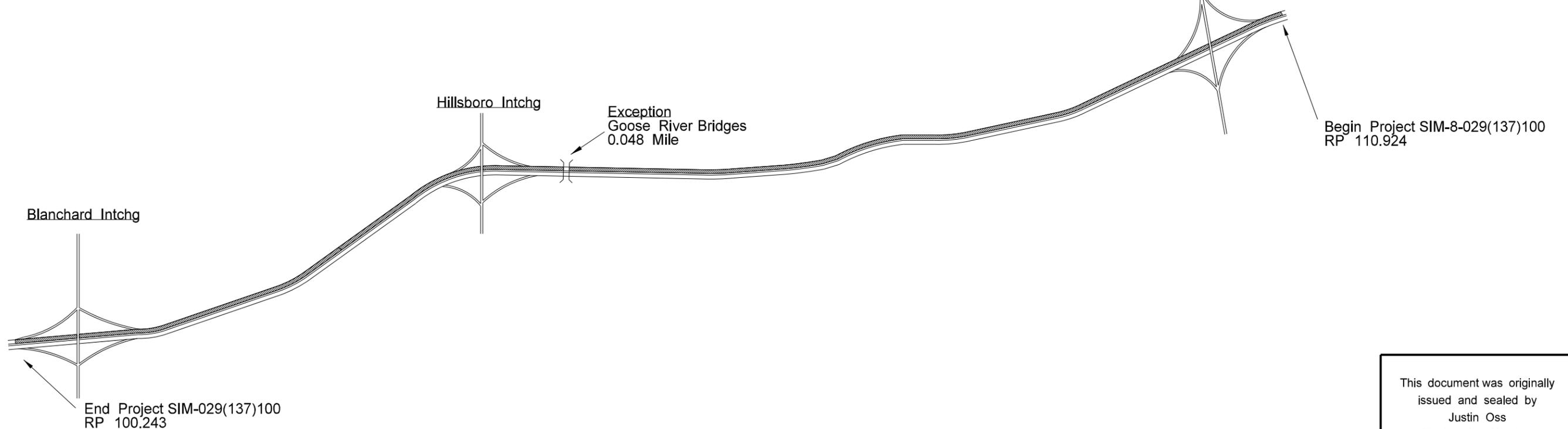
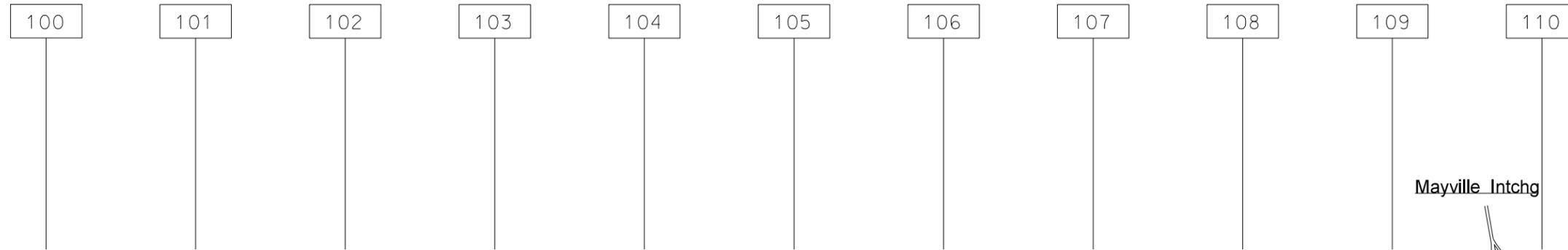
SPECIAL PROVISIONS

559(08) Permanent Pavement Monitoring System

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Project Number / Description
SIM-8-029(137)100



 Concrete Pavement Repair

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Scope of Work
Concrete Pavement Repair
Near Blanchard to ND 200 - Southbound

NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-8-029(137)100	6	1

GENERAL NOTES

100-P01 COORDINATION OF PROJECTS: Another project under contract during the 2014 construction season in the vicinity of this project is S-BRI-8-029(150)094. This project consists of structure painting. The contractor shall coordinate work such that one does not interfere with the other.

107-P01 HAUL ROAD RESTRICTIONS: No roads will be used as haul roads unless the contractor obtains written approval from the government agency or agencies and the engineer prior to prejob. The engineer will determine what government agency or agencies approvals are appropriate.

570-P01 TRANSVERSE AND LONGITUDINAL JOINTS CLEANING AND SEALING: All concrete repairs that are to be sawed, cleaned and sealed as indicated in the detail plan sheets shall be incorporated into other 570 bid items. This includes all costs for labor, materials, and equipment to form, saw, clean, and seal these described joints.

570-P02 CONCRETE PAVEMENT REPAIR: An additional 20% has been added to the quantities for CONCRETE PAVEMENT REPAIR – FULL DEPTH – DOWELED, SAW CONCRETE, DOWEL BARS, SPALL REPAIR – PARTIAL DEPTH, RANDOM PCC CRACK CLEANING AND SEALING, and 9” CONC PVMT REPAIR-SPOT FULL DEPTH to be used as directed by the engineer.

Any aggregate needed for leveling or obtaining the proper cross-slope will not be paid for separately, but will be included in other 570 bid items.

570-P03 PAVEMENT REINFORCING: Reinforcing steel shall be provided and placed at the full depth locations that are immediately over centerline pipe. All costs to provide, place, and support the reinforcing steel as shown shall be included in the price bid for concrete pavement repair items.

570-P04 CONC PVMT REPAIR-SPOT FULL DEPTH: During removal of pavement for spall repair, if the engineer determines the pavement distress goes beyond a spall repair, the repair shall be measured and paid as per 570.04 A.1 in the standard specifications. Full payment will coincide with the bid item “9 IN CONC PVMT REPAIR-SPOT FULL DEPTH” and half payment for “SPALL REPAIR – PARTIAL DEPTH.”

During removal, longitudinal spall repairs that fall along the longitudinal joints that are determined to go beyond a spall repair shall be paid under the bid item “CONC PVMT REPAIR-SPOT FULL DEPTH. All No. 5, 22” tie bars are not to be paid for separately, but shall be incorporated into other 570 bid items. All No. 9, 18” dowel bars shall be paid for at the unit bid price for “DOWEL BARS.”

All costs for labor, materials, and equipment to complete this work shall be incorporated into the unit bid price for “CONC PVMT REPAIR-SPOT FULL DEPTH.”

570-P05 EPOXY COATED DEFORMED BARS (STITCHING): The tie bars shall be Grade 60 and epoxy-coated according to AASHTO M-284. The epoxy resin adhesive shall be of the type

intended for horizontal application and shall meet requirements of AASHTO M-235, Type 1, Grade 3. The contractor shall mix the epoxy resin as recommended by the manufacturer.

The method of measurement for "Epoxy Coated Deformed Bars" shall be by actual count of the number of bars installed and accepted by the engineer. Any bars not functioning or damaged shall be replaced at the expense of the contractor.

All costs, including materials, equipment, and labor to complete the work as specified shall be included in the price bid for "Epoxy Coated Deformed Bars".

570-P06 WORK SEQUENCE: The contractor shall follow the work sequence for Portland Cement Concrete Pavement Repair as described in Section 570.04 B.2 of the Standard Specifications for Road and Bridge Construction with the addition of performing the cross-stitching along longitudinal joints before the PCC pavement grinding.

704-016 TRAFFIC CONTROL SUPERVISOR: Traffic control supervisor shall be provided on this project. The traffic control supervisor along with a phone number shall be identified at the Pre-construction meeting.

704-P01 TRAFFIC CONTROL DEVICES: The traffic control devices list has been developed using the following layouts on the Standard Drawing for traffic control: D-704-35,

704-P02 MAINTENANCE & PROTECTION OF TRAFFIC FOR CONCRETE PAVEMENT REPAIRS: The layouts for construction signing for various lane closures show the required devices for each situation. In full depth removal areas vertical panels shall be spaced at 10 feet on centerline roadway until the concrete has been replaced. A minimum of two vertical panels shall be used at each full depth removal area.

Type I Barricades shall be placed in front of each open area or as directed by the Engineer. The barricades shall not encroach onto the traffic lane.

The concrete pavement repairs must be completed for the entire length of one lane closure before starting any work in the adjacent lane or new phase. Traffic control devices are based off of a 5.5 mile closure with additional devices for ramp repairs. Lane closures shall not be longer than 5.5 miles

If the contractor is going to operate in a manner other than as herein provided, a complete traffic control layout and program will be provided to the engineer for review, and approval will have to be given before any additional work is performed.

704-P04 CONSTRUCTION TRAFFIC: The contractor’s construction traffic required for concrete pavement repair shall be limited to access at interchanges only. Construction traffic will not be permitted to operate in the median nor will access from one roadway to the other roadway, through the median, be permitted.

The contractor shall provide one lane for traffic at all times. The contractor’s traffic shall be in the same direction as public traffic.

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Ramp traffic shall be maintained at all times during the pavement removal and replacement.

706-P01 FIELD LABORATORY – TYPE B: Project SIM-8-029(105)100 is tied to this project. One field lab has been provided for the two projects and will be paid under project SIM-8-029(105)100.

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ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-8-029(137)100	8	1

SPEC CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
-----	-----	-----	-----	-----
103	0100 CONTRACT BOND	L SUM	0.439	0.439
570	0095 SAW CONCRETE	LF	4,583	4,583
570	0210 PCC PAVEMENT GRINDING	SY	111,406	111,406
570	0240 DOWELED CONTRACTION JOINT ASSEMBLY	LF	778	778
570	0424 DOWEL BARS	EA	1,168	1,168
570	0650 CONCRETE PAVEMENT REPAIR-FULL DEPTH-DOWELED	SY	2,010	2,010
570	0703 9IN CONC PVMT REPAIR-SPOT FULL DEPTH	SF	438	438
570	0966 RANDOM PCC CRACK CLEANING & SEALING	LF	7,424	7,424
570	1512 SPALL REPAIR-PARTIAL DEPTH	SF	4,750	4,750
570	1600 EPOXY COATED DEFORMED BARS	EA	10,460	10,460
702	0100 MOBILIZATION	L SUM	0.367	0.367
704	0100 FLAGGING	MHR	500	500
704	1000 TRAFFIC CONTROL SIGNS	UNIT	1,258	1,258
704	1050 TYPE I BARRICADE	EA	40	40
704	1052 TYPE III BARRICADE	EA	10	10
704	1060 DELINEATOR DRUMS	EA	49	49
704	1067 TUBULAR MARKERS	EA	370	370
704	1081 VERTICAL PANELS-BACK TO BACK	EA	107	107
704	1087 SEQUENCING ARROW PANEL-TYPE C	EA	1	1
762	0113 EPOXY PVMT MK 4IN LINE	LF	128,791	128,791

BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-8-029(137)100	10	1

Permanent Pavement Marking

Southbound 2 Lanes		
Location - Type	Basis	Quantity
Centerline – Epoxy Pvmt MK 4 IN Line	Centerline Skips 1,320 LF/mile 10.681 Miles	14,099 LF
Edge Lines – Epoxy Pvmt MK 4 IN Line	10,560 LF/mile	114,692 LF

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	1

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
110.924	4879	DL		X					2	X	2	4			
110.795	4198	SHLDR		X						X			30	RT SHLDR	
110.775	4092	SHLDR		X					2	X	2	4	10	RT SHLDR	
110.772	4076	PL	7	X	12	9	38	20		X					
110.757	3997	SHLDR		X									15	RT SHLDR	
110.749	3955	SHLDR		X						X			30	RT SHLDR	
110.703	3712	DL		X					2	X	2	4			
110.679	3585	DL		X					2	X	2	4			
110.633	3342	DL	3.5	X	3.5	1	14	4		X				SPOT FULL DEPTH/CORNER	
110.615	3247	DL		X					2	X	2	4			
110.605	3194	GORE		X						X			30	GORE AREA	
110.582	3073	DL	20	X	12	27	64	20	12					OVER PIPE(reinf mat)	
110.579	3057	DL		X					2	X	2	4			
110.579	3057	DL		X					2	X	2	4			
110.571	3015	DL		X					2	X	2	4			
110.549	2899	DL		X					2	X	2	4			
110.525	2772	DL		X					2	X	2	4			
110.491	2592	PL	3.5	X	3.5	1	14	4							
110.453	2392	DL		X					2	X	2	4			
110.432	2281	DL		X					2	X	2	4			
110.401	2117	SHLDR		X					2	X	2	4		RT SHLDR	
110.363	1917	DL		X					2	X	2	4			
110.309	1632	PL		X					2	X	2	4			
110.278	1468	DL		X					2	X	2	4			
110.270	1426	DL		X					2	X	2	4			
110.263	1389	DL		X					2	X	2	4			
110.227	1199	DL		X					2	X	2	4			
110.227	1199	DL		X					2	X	2	4			
110.209	1104	DL		X					2	X	2	4			
110.191	1008	DL		X					2	X	2	4			
110.168	887	DL		X					2	X	2	4			
110.158	834	DL		X					2	X	2	4			
110.158	834	DL		X					2	X	2	4			
110.132	697	DL		X					2	X	2	4			
110.117	618	DL		X					2	X	2	4			
110.112	591	DL		X					2	X	2	4			
110.086	454	DL		X					2	X	2	4			

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Southbound
Data Table
RP 110.086 to RP 110.924

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	2

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
110.076	401	DL		X					2	X	2	4			
110.071	375	DL		X					2	X	2	4			
110.068	359	DL		X					2		2	4			
110.061	322	DL		X					2	X	2	4			
110.061	322	DL		X					4	X	2	8		ON RETROFIT	
110.058	306	DL		X					4	X	2	8		ON RETROFIT	
110.058	306	DL		X					4	X	2	8		ON RETROFIT	
110.055	290	DL		X					4	X	2	8		ON RETROFIT	
110.055	290	DL		X					4	X	2	8		ON RETROFIT	
110.053	280	DL		X					4	X	2	8		ON RETROFIT	
110.053	280	DL		X					4	X	2	8		ON RETROFIT	
110.051	269	DL		X					4	X	2	8		ON RETROFIT	
110.051	269	DL		X					4	X	2	8		ON RETROFIT	
110.048	253	DL		X					4	X	2	8		ON RETROFIT	
110.048	253	DL		X					4	X	2	8		ON RETROFIT	
110.045	238	DL		X					4	X	2	8		ON RETROFIT	
110.014	74	DL		X					2	X	2	4			
110.014	74	DL		X					2	X	2	4			
110.007	37	PL		X					2	X	2	4			
110.000	0	DL		X					4	X	2	8		ON RETROFIT	
SUBTOTAL						10	130	48				12	248	115	
109.983	5190	DL		X					2	X	2	4			
109.973	5137	DL		X					2	X	2	4			
109.997	5264	DL		X					2	X	2	4			
109.980	5174	DL		X					2	X	2	4			
109.980	5174	DL		X					2	X	2	4			
109.959	5064	DL		X					2	X	2	4			
109.957	5053	DL		X					2	X	2	4			
109.938	4953	DL		X					2	X	2	4			
109.919	4852	SHLDR											112		
109.918	4847	DL		X					2	X	2	4			
109.898	4741	DL		X					2	X	2	4			
109.898	4741	DL		X					2	X	2	4			
109.890	4699	DL		X					2	X	2	4			
109.862	4551	DL		X					4	X	2	8		ON RETROFIT	
109.857	4525	DL		X					2	X	2	4			
109.854	4509	DL		X					4	X	2	8		ON RETROFIT	
109.852	4499	DL		X					2	X	2	4			

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Southbound
Data Table
RP 109.852 to RP 110.076

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	3

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
109.852	4499	DL		X						2	X	2	4		
109.844	4456	DL		X						2	X	2	4		
109.837	4419	SHLDR												84	
109.836	4414	DL		X						2	X	2	4		
109.816	4308	PL		X						2	X	2	4		
109.798	4213	DL		X						2	X	2	4		
109.780	4118	DL		X						2	X	2	4		
109.773	4081	DL		X						2	X	2	4		
109.731	3860	DL		X						2	X	3	6		ON RETROFIT
109.729	3849	DL	6	X	12	8	36	20			X				TRANS JOINT ON RETROFIT
109.724	3823	DL	21	X	12	28	66	20	12		X				OVER PIPE(reinf mat)
109.693	3659	DL		X						2	X	2	4		
109.638	3369	DL		X						2	X	2	4		
109.638	3369	DL		X						2	X	2	4		
109.622	3284	PL		X						2	X	2	4		
109.619	3268	DL		X						2	X	2	4		
109.609	3216	PL		X						2	X	2	4		
109.586	3094	DL		X						2	X	5	10		ON RETROFIT
109.581	3068	DL		X						2	X	2	4		
109.578	3052	PL		X						2	X	2	4	10	RT SHLDR
109.571	3015	DL		X						2	X	2	4		
109.566	2988	DL		X						2	X	2	4		
109.564	2978	DL		X						2	X	2	4		
109.556	2936	DL		X						2	X	2	4		
109.546	2883	DL		X						2	X	2	4		
109.525	2772	PL		X						2	X	3	6		
109.512	2703	DL		X						2	X	2	4		
109.505	2666	DL		X						4	X	2	8		ON RETROFIT
109.500	2640	SHLDR		X							X			30	RIGHT SHOULDER
109.482	2545	PL		X						2	X	2	4		
109.479	2529	DL		X						4	X	2	8		ON RETROFIT
109.474	2503	DL		X						2	X	2	4		
109.463	2445	DL		X						2	X	2	4		
109.452	2387	PL/SHDR	21	X	16	37	74	20	12		X				OVER PIPE(reinf mat)
109.448	2365	PL/SHDR	21	X	16	37	74	20	12		X				OVER PIPE(reinf mat)
109.438	2313	DL/SHDR	111	X	22	271	266	20	84		X				OVER PIPE(reinf mat)
109.436	2302	PL		X						2	X	2	4		

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Southbound
Data Table
RP 109.436 to RP 109.852

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	4

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
109.435	2297	DL		X					2	X	2	4			
109.426	2249	SHLDR		X						X			15	RT SHLDR	
109.420	2218	PL		X					2	X	2	4			
109.410	2165	DL		X					2	X	2	4			
109.407	2149	PL		X					2	X	2	4			
109.400	2112	PL		X					2	X	2	4			
109.392	2070	DL		X					2	X	2	4			
109.390	2059	SHLDR											15		
109.387	2043	PL		X					2	X	2	4			
109.372	1964	PL		X					2	X	2	4			
109.369	1948	DL		X					2	X	2	4			
109.353	1864	DL		X					2	X	2	4			
109.341	1800	DL		X					2	X	2	4			
109.336	1774	DL		X					2	X	2	4			
109.333	1758	DL		X					2	X	2	4			
109.328	1732	DL		X					2	X	2	4			
109.321	1695	DL		X					2	X	2	4			
109.316	1668	DL		X					6	X	2	12			
109.297	1568	DL		X					2	X	2	4			
109.295	1558	DL		X					2	X	2	4			
109.292	1542	DL		X					2	X	2	4			
109.285	1505	DL		X					2	X	2	4			
109.259	1368	SHLDR		X						X			45	RT SHLDR	
109.246	1299	PL		X					2	X	2	4			
109.243	1283	DL		X					2	X	2	4			
109.231	1220	SHLDR		X					4	X	2	8	30	RT SHLDR	
109.228	1204	DL		X					2	X	2	4			
109.226	1193	DL		X					2	X	2	4			
109.221	1167	DL		X					2	X	2	4			
109.215	1135	DL		X					2	X	2	4			
109.208	1098	DL		X					2	X	2	4			
109.175	924	DL		X					2	X	2	4			
109.168	887	DL		X					2	X	2	4			
109.161	850	DL		X					2	X	2	4			
109.141	744	SHLDR		X						X			30	RT SHLDR	
109.120	634	DL		X					2	X	2	4			
109.105	554	DL		X					2	X	2	4			

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Southbound
Data Table
RP 109.105 to RP 109.435

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	5

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
109.095	502	DL		X					2	X	2	4			
109.051	269	DL		X					2	X	2	4			
109.038	201	PL		X					2	X	2	4			
109.031	164	DL		X					2	X	2	4			
SUBTOTAL						382	516	100	120			370	371		
108.942	4974	DL		X					2	X	2	4			
108.916	4836	DL		X					2	X	2	4			
108.905	4778	SHLDR		X						X			15	RT SHLDR	
108.895	4726	DL		X					2	X	2	4			
108.890	4699	DL		X					2	X	2	4			
108.880	4646	SHLDR		X						X			45	RT SHLDR	
108.867	4578	SHLDR		X						X			15	RT SHLDR	
108.857	4525	DL		X					2	X	2	4			
108.857	4525	DL		X					2	X	2	4			
108.831	4388	DL		X					2	X	2	4			
108.816	4308	DL		X					2	X	2	4	45	RT SHLDR	
108.813	4293	DL		X					2	X	2	4			
108.808	4266	PL		X					2	X	3	6			
108.798	4213	DL		X					2	X	2	4			
108.790	4171	DL		X						X			15	RT SHLDR	
108.764	4034	DL		X					2	X	2	4			
108.718	3791	DL		X					2	X	2	4			
108.713	3765	DL		X					2	X	2	4			
108.702	3707	SHLDR		X						X			412	RT SHLDR	
108.699	3691	DL	21	X	12	28	66	20	12		X			OVER PIPE(reinf mat)	
108.699	3691	PL	21	X	12	28	66	20	12		X			OVER PIPE(reinf mat)	
108.696	3675	PL	21	X	16	37	74	20	12		X			OVER PIPE(reinf mat)	
108.695	3670	PL	21	X	16	37	74	20	12		X			OVER PIPE(reinf mat)	
108.693	3659	DL		X						2	X	2	4		
108.690	3643	SHLDR		X							X		164	RT SHLDR	
108.655	3458	SHLDR		X						2	X	2	4	10	RT SHLDR
108.651	3437	SHLDR		X							X		30	RT SHLDR	
108.641	3384	DL		X						2	X	2	4		
108.603	3184	DL		X						2	X	2	4		
108.603	3184	DL		X						2	X	2	4		
108.595	3142	DL		X						2	X	2	4		
108.595	3142	DL		X						2	X	2	4		

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Southbound
Data Table
RP 108.595 to RP 109.095

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	6

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
108.558	2946	DL		X					2	X	3	6		ON RETROFIT	
108.539	2846	SHLDR		X						X			512	RT SHLDR	
108.539	2846	DL		X					2	X	8	16		RT SHLDR	
108.507	2677	SHLDR		X						X			15	RT SHLDR	
108.489	2582	DL		X						X			10		
108.476	2513	SHLDR											158		
108.444	2344	DL		X					2	X	2	4			
108.474	2503	PL		X					4	X	4	16			
108.434	2292	DL		X									15		
108.423	2233	DL		X					2	X	2	4			
108.408	2154	DL		X					2	X	2	4			
108.401	2117	SHLDR		X						X			10	RT SHLDR	
108.400	2112	DL		X					2	X	2	4			
108.400	2112	DL		X					2	X	2	4			
108.393	2075	DL		X					2	X	2	4	30	RT SHLDR	
108.362	1911	DL		X					2	X	2	4			
108.347	1832	SHLDR		X						X			15	RT SHLDR	
108.324	1711	DL		X					2	X	2	4			
108.316	1668	DL		X					2	X	2	4			
108.314	1658	SHLDR											70		
108.311	1642	DL		X					2	X	2	4	15	RT SHLDR	
108.290	1531	DL		X					2	X	2	4			
108.290	1531	DL		X					2	X	2	4			
108.252	1331	DL		X					2	X	2	4			
108.252	1331	DL		X					2	X	2	4			
108.249	1315	DL		X					2	X	2	4			
108.249	1315	DL		X					2	X	2	4			
108.241	1272	SHLDR		X						X			10	RT SHLDR	
108.232	1225	DL		X					2	X	2	4			
108.211	1114	DL		X					2	X	2	4			
108.207	1093	SHLDR		X						X			10	RT SHLDR	
108.183	966	SHLDR		X						X			10	RT SHLDR	
108.178	940	DL		X					2	X	2	4			
108.178	940	DL		X					2	X	2	4			
108.175	924	DL		X					2	X	2	4			
108.175	924	DL		X					2	X	2	4			
108.134	708	DL		X					2	X	3	6		ON RETROFIT	
108.084	444	DL		X					2	X	2	4			

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Southbound
Data Table
RP 108.084 to RP 108.558

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	7

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
108.049	259	DL		X					2	X	2	4			
108.012	63	DL	20	X	12	27	64	20	12					OVER PIPE(reinf mat)	
108.004	21	SHLDR		X						X			10	RT SHLDR	
108.000	0	SHLDR		X						X			10	RT SHLDR	
SUBTOTAL						157	344	100	60			226	1,651		
107.978	5164	DL		X						2	X	2			
107.968	5111	DL		X						2	X	2	4		
107.968	5111	DL		X						2	X	2	4		
107.955	5042	DL		X						2	X	2	4		
107.834	4404	SHLDR		X							X		10	RT SHLDR	
107.824	4351	DL		X						2	X	2	4		
107.822	4340	DL		X						2	X	2	4		
107.788	4161	DL		X						4	X	2	8	ON RETROFIT	
107.700	3696	DL		X						2	X	2	4		
107.756	3992	DL		X						2	X	2	4		
107.747	3944	DL		X						2	X	2	4		
107.729	3849	DL		X						2	X	2	4		
107.710	3749	DL		X						2	X	2	4		
107.710	3749	DL		X						2	X	2	4		
107.702	3707	DL		X						3	X	2	6	ON RETROFIT	
107.688	3633	DL		X						2	X	2	4		
107.654	3453	DL		X						2	X	2	4		
107.644	3400	DL		X						2	X	2	4		
107.631	3332	DL		X						2	X	2	4		
107.628	3316	DL		X						2	X	2	4		
107.610	3221	DL		X						2	X	2	4		
107.607	3205	DL		X						2	X	2	4		
107.594	3136	SHLDR		X							X		15	RT SHLDR	
107.544	2872	DL		X						2	X	2	4		
107.533	2814	DL		X						2	X	2	4		
107.528	2788	DL		X						2	X	2	4		
107.521	2751	DL		X						2	X	2	4		
107.508	2682	DL		X						2	X	2	4		
107.499	2635	SHLDR		X									135	RT SHLDR	
107.495	2614	DL		X						2	X	2	4		
107.487	2571	DL		X						2	X	2	4		
107.474	2503	DL		X						2	X	2	4		

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Southbound
Data Table
RP 107.474 to RP 108.049

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	8

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
107.459	2424	DL		X						2	X	2	4		
107.459	2424	DL		X						2	X	2	4		
107.449	2371	DL		X						2	X	2	4		
107.447	2360	SHLDR		X							X			215	RT SHLDR
107.428	2260	DL		X						2	X	2	4		
107.420	2218	DL		X						2	X	2	4		
107.407	2149	DL		X						2	X	2	4		
107.392	2070	DL		X						2	X	2	4		
107.385	2033	DL		X						2	X	2	4		
107.382	2017	DL		X						2	X	2	4		
107.373	1969	DL	21	X	12	28	66	20	12		X				
107.356	1880	DL	21	X	12	28	66	20	12		X				
107.358	1890	SHLDR		X							X			90	RT SHLDR
107.347	1832	DL	21	X	12	28	66	20	12		X				
107.321	1695	DL		X						4	X	2	8		ON RETROFIT
107.305	1610	DL		X						2	X	2	4		ON RETROFIT
107.294	1552	DL		X						4	X	2	8		ON RETROFIT
107.291	1536	SHLDR		X							X			95	RT SHLDR
107.265	1399	SHLDR		X							X			10	RT SHLDR
107.261	1378	DL		X						2	X	2	4		
107.258	1362	SHLDR		X							X			60	RT SHLDR
107.259	1368	DL		X						2	X	2	4		
107.249	1315	DL		X						2	X	2	4		
107.238	1257	DL		X						4	X	2	8		ON RETROFIT
107.225	1188	DL		X						2	X	2	4		
107.189	998	DL		X						2	X	2	4		
107.167	882	SHLDR		X							X			10	RT SHLDR
107.121	639	DL		X						2	X	2	4		
107.092	486	DL		X						4	X	3	12		ON REFROFIT
107.066	348	DL		X						2	X	2	4		
107.025	132	PL	3.5	X	3.5	1	14	4			X				SPOT REPAIR/CORNER
107.015	79	DL		X						2	X	2	4		
107.003	16	DL		X						2	X	2	4		
SUBTOTAL						85	212	64	36				230	640	
106.986	5206	DL		X						2	X	2	4		
106.983	5190	DL		X						4	X	2	8		ON RETROFIT
106.976	5153	DL		X						2	X	2	4		

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Southbound
Data Table
RP 106.976 to RP 107.459

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	9

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
106.973	5137	DL		X					2	X	2	4			
106.914	4826	DL	21	X	12	28	66	20	12					OVER PIPE (reinf mat)	
106.914	4826	PL	21	X	12	28	66	20	12					OVER PIPE (reinf mat)	
106.901	4757	DL		X					2	X	2	4			
106.896	4731	DL		X					2	X	2	4			
106.896	4731	DL		X					2	X	2	4			
106.888	4689	DL		X					2	X	2	4			
106.881	4652	PL		X					2	X	2	4			
106.879	4641	SHLDR		X						X			10	RT SHLDR	
106.879	4641	SHLDR		X						X			10	RT SHLDR	
106.791	4176	DL		X					2	X	2	4			
106.788	4161	DL		X					2	X	2	4			
106.773	4081	DL		X					4	X	2	8		ON RETROFIT	
106.863	4557	SHLDR		X						X			10	RT SHLDR	
106.783	4134	SHLDR		X						X			60	RT SHLDR	
106.761	4018	DL		X					2	X	2	4			
106.760	4013	DL		X					2	X	2	4			
106.759	4008	DL		X					2	X	2	4			
106.756	3992	DL		X					2	X	2	4			
106.753	3976	DL		X					2	X	2	4			
106.747	3944	SHLDR		X						X			10	RT SHLDR	
106.743	3923	SHLDR		X						X			10	RT SHLDR	
106.737	3891	DL		X					2	X	2	4			
106.737	3891	DL		X					2	X	2	4			
106.723	3817	SHLDR		X						X			5	RT SHLDR	
106.711	3754	SHLDR		X						X			60	RT SHLDR	
106.701	3701	DL		X					2	X	2	4			
106.699	3691	DL		X					2	X	2	4			
106.696	3675	SHLDR		X						X			45	RT SHLDR	
106.688	3633	DL		X					2	X	2	4			
106.686	3622	DL		X					2	X	2	4			
106.662	3495	PL	21	X	16	37	74	20	12					OVER PIPE(reinf mat)	
106.655	3458	DL		X					2	X	2	4			
106.647	3416	SHLDR		X						X			60	RT SHLDR	
106.647	3416	DL		X					2	X	2	4			
106.634	3348	DL		X					2	X	2	4			

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Southbound
Data Table
RP 106.634 to RP 106.973

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	10

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
106.632	3337	SHLDR		X						X				15	RT SHLDR
106.563	2973	SHLDR		X						X				105	
106.519	2740	SHLDR		X						X				340	RT SHLDR
106.436	2302	DL		X						2	X	2	4		
106.429	2265	SHLDR		X						X				190	RT SHLDR
106.426	2249	DL		X						2	X	2	4		
106.426	2249	DL		X						2	X	2	4		
106.408	2154	DL		X						2	X	3	6		ON RETROFIT
106.394	2080	DL		X						2	X	2	4		
106.380	2006	SHLDR		X						X				30	RT SHLDR
106.359	1896	SHLDR		X						X				15	RT SHLDR
106.349	1843	SHLDR		X						X				190	RT SHLDR
106.322	1700	SHLDR		X						X				320	RT SHLDR
106.316	1668	SHLDR		X						2	X	2	4		RT SHLDR
106.306	1616	DL	4	X	4	2	16	4		X					SPOT FULL DEPTH
106.281	1484	DL		X						2	X	2	4		
106.276	1457	PL	4	X	4	2	16	4		X					SPOT FULL DEPTH
106.247	1304	SHLDR		X						X				95	RT SHLDR
106.240	1267	PL		X						2	X	2	4		
106.224	1183	DL		X						2	X	2	4		
106.217	1146	DL		X						2	X	2	4		
106.171	903	SHLDR		X						X				125	RT SHLDR
106.159	840	DL	21	X	12	28	66	20	12	X					
106.137	723	SHLDR		X						X				90	RT SHLDR
106.113	597	SHLDR		X						X				200	RT SHLDR
106.102	539	DL	7	X	12	9	38	20		X					
106.068	359	DL	7	X	12	9	38	20		X					
106.063	333	SHLDR		X						X				70	RT SHLDR
106.044	232	DL	21	X	12	28	66	20	12	X					
106.037	195	DL		X						2	X	2	4		
106.032	169	DL		X						2	X	2	4		
106.024	127	SHLDR		X						X				75	RT SHLDR
106.020	106	DL	21	X	12	28	66	20	12	X					
106.004	21	SHLDR		X						X				100	RT SHLDR
SUBTOTAL						200	512	168	72			162	2240		
105.991	5232	SHLDR		X						2	X	2	4		RT SHLDR
105.982	5185	SHLDR		X						X				30	RT SHLDR

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Southbound
Data Table
RP 105.982 to RP 106.632

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-8-029(137)100	11	11

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments	
			Length	X	Width					Length	X	Width				
105.969	5116	SHLDR		X						X				75	RT SHLDR	
105.966	5100	DL	21	X	12	28	66	20	12		X					
105.945	4990	SHLDR		X							X			40	RT SHLDR	
105.937	4947	SHLDR	61	X	10	68	81				X				RT SHLDR	
105.933	4926	DL	21	X	12	28	66	20	12		X					
105.926	4889	SHLDR		X							X			80	RT SHLDR	
105.924	4879	DL		X						2	X	2	4			
105.911	4810	SHLDR	21	X	10	23	41				X				RT SHLDR	
105.909	4800	SHLDR		X							X			30	RT SHLDR	
105.901	4757	DL		X						2	X	2	4			
105.886	4678	DL		X						2	X	2	4			
105.883	4662	SHLDR		X							X			15	RT SHLDR	
105.875	4620	DL		X						2	X	2	4			
105.874	4615	SHLDR		X							X			105	RT SHLDR	
105.859	4536	DL	21	X	12	28	66	20	12		X					
105.851	4493	DL	21	X	12	28	66	20	12		X					
105.849	4483	SHLDR		X						2	X	8	16		RT SHLDR	
105.832	4393	DL		X						2	X	2	4			
105.815	4303	SHLDR		X							X			15	RT SHLDR	
105.802	4235	DL	21	X	12	28	66	20	12		X				OVER PIPE(reinf mat)	
105.792	4182	SHLDR		X							X			15	RT SHLDR	
105.789	4166	SHLDR		X							X			10	RT SHLDR	
105.768	4055	SHLDR		X							X			15	RT SHLDR	
105.767	4050	DL		X						2	X	2	4			
105.732	3865	DL		X						2	X	2	4			
105.726	3833	DL		X						2	X	2	4			
105.703	3712	PL		X						2	X	2	4			
105.698	3685	DL		X						2	X	2	4			
105.696	3675	SHLDR		X							X			90	RT SHLDR	
105.679	3585	SHLDR		X						8	X	15	120		RT SHLDR	
105.679	3585	DL	6	X	12	8	36	20			X					
105.673	3553	DL		X						2	X	2	4			
105.662	3495	SHLDR		X						2	X	6	12		RT SHLDR	
105.657	3469	SHLDR		X						4	X	2	8		RT SHLDR	
105.654	3453	SHLDR		X						2	X	2	4		RT SHLDR	
105.651	3437	DL	21	X	12	28	66	20	12		X					
SUBTOTAL						267	636	120	144				204	490		

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Southbound
Data Table
RP 105.651 to RP 105.969

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	12

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
105.641	3384	SHLDR		X						2	X	8	16		RT SHLDR
105.634	3348	SHLDR		X						2	X	2	4		RT SHLDR
105.634	3348	DL		X						2	X	2	4		
105.618	3263	DL	6	X	12	8	36	20			X				
105.594	3136	DL	21	X	24	56	90	40	12		X				
105.588	3105	DL		X						2	X	2	4		
105.584	3084	SHLDR		X							X		30		RT SHLDR
105.583	3078	DL		X						2	X	2	4		
105.567	2994	SHLDR		X							X		70		RT SHLDR
105.562	2967	SHLDR		X						3	X	2	6		RT SHLDR
105.560	2957	DL		X						2	X	2	4		
105.547	2888	DL		X						2	X	2	4		
105.540	2851	SHLDR	15	X	10	17	35				X				RT SHLDR
105.526	2777	DL		X						2	X	2	4		
105.486	2566	SHLDR		X						2	X	2	4		RT SHLDR
105.486	2566	SHLDR		X						2	X	2	4		RT SHLDR
105.486	2566	DL		X						2	X	2	4		
105.465	2455	SHLDR		X							X		45		RT SHLDR
105.461	2434	SHLDR		X						2	X	10	20		RT SHLDR
105.460	2429	SHLDR		X						2	X	2	4		RT SHLDR
105.438	2313	SHLDR	15	X	10	17	35				X				RT SHLDR
105.435	2297	SHLDR		X							X		20		RT SHLDR
105.385	2033	SHLDR		X							X		10		RT SHLDR
105.343	1811	DL		X						2	X	2	4		
105.315	1663	DL		X						2	X	2	4		
105.307	1621	DL		X						2	X	3	6		ON RETROFIT
105.302	1595	DL		X						2	X	2	4		
105.279	1473	DL		X						2	X	2	4		
105.251	1325	DL		X						2	X	2	4		
105.210	1109	DL		X						2	X	2	4		
105.186	982	PL		X						3	X	2	6		
105.177	935	DL		X						2	X	2	4		
105.175	924	DL		X						2	X	2	4		
105.169	892	DL		X						2	X	2	4		
105.167	882	PL		X						2	X	2	4		

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Southbound
Data Table
RP 105.167 to RP 105.641

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	13

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
105.167	882	DL		X						2	X	2	4		
105.156	824	DL		X						2	X	2	4		
105.128	676	DL		X						2	X	3	6		ON RETROFIT
105.087	459	PL	21	X	4	9	50	14			X				SPOT FULL DEPTH
105.016	84	DL		X						2	X	2	4		
105.006	32	SHLDR		X						2	X	2	4		RT SHLDR
SUBTOTAL						107	246	74	12				160	175	
104.999	5275	DL		X						2	X	2	4		
104.973	5137	DL	6	X	12	8	36	20			X				
104.944	4984	DL		X						2	X	2	4		
104.944	4984	DL		X						2	X	2	4		
104.848	4477	DL		X						2	X	2	4		
104.841	4440	SHLDR		X							X			10	RT SHLDR
104.818	4319	PL		X						2	X	2	4		
104.797	4208	PL	21	X	4	9	50	14			X				SPOT FULL DEPTH
104.792	4182	DL		X						2	X	3	6		
104.787	4155	DL		X						2	X	2	4		
104.780	4118	DL		X						2	X	4	8		ON RETROFIT
104.770	4066	DL		X						2	X	2	4		
104.749	3955	DL		X						2	X	2	4		
104.746	3939	SHLDR	15	X	10	17	35				X				RT SHLDR
104.692	3654	DL		X						2	X	2	4		
104.672	3548	DL		X						2	X	4	8		
104.662	3495	DL		X						2	X	3	6		
104.640	3379	SHLDR		X						2	X	2	4		RT SHLDR
104.616	3252	DL		X						2	X	2	4		
104.613	3237	DL		X						2	X	2	4		
104.611	3226	DL		X						4	X	4	16		ON RETROFIT
104.611	3226	DL		X						2	X	2	4		
104.607	3205	DL		X						2	X	2	4		
104.607	3205	DL		X						2	X	2	4		
104.560	2957	SHLDR		X						2	X	8	16		RT SHLDR
104.555	2930	SHLDR		X						2	X	2	4		RT SHLDR
104.549	2899	DL/PL		X						4	X	24	96		FULL WIDTH INCLUDING RETROFIT
104.545	2878	DL	21	X	12	28	66	20	12		X				
104.535	2825	PL		X						2	X	2	4		
104.520	2746	DL	36	X	12	48	96	8	24		X				

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Southbound
Data Table
RP 104.520 to RP 105.167

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	14

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
104.471	2487	SHLDR		X						X				10	RT SHLDR
104.464	2450	SHLDR		X						2	X	2	4		RT SHLDR
104.459	2424	SHLDR		X						2	X	2	4		RT SHLDR
104.448	2365	DL		X						6	X	2	12		
104.448	2365	SHLDR		X						2	X	2	4		RT SHLDR
104.444	2344	PL		X						2	X	2	4		
104.425	2244	SHLDR		X						2	X	10	20		RT SHLDR
104.393	2075	DL		X						4	X	2	8		ON RETROFIT
104.393	2075	PL		X						4	X	2	8		
104.376	1985	DL		X						2	X	2	4		
104.354	1869	PL		X						2	X	2	4		
104.330	1742	SHLDR		X						2	X	5	10		RT SHLDR
104.313	1653	GORE		X						2	X	2	4		GORE
104.287	1515	SHLDR		X						2	X	2	4		RT SHLDR
104.279	1473	DL		X						2	X	2	4		
104.262	1383	DL		X						4	X	2	8		ON RETROFIT
104.160	845	DL		X						4	X	2	8		ON RETROFIT
104.149	787	PL		X						4	X	2	8		
104.139	734	PL		X						4	X	2	8		
104.103	544	DL		X						2	X	2	4		
104.065	343	PL		X						3	X	2	6		
104.050	264	DL		X						2	X	2	4		
104.011	58	DL/PL		X						4	X	2	8		
SUBTOTAL						110	283	62	36				372	20	
103.992	5238	DL	3.5	X	3.5	1	14	4			X				SPOT FULL DEPTH/CORNER
103.956	5048	DL		X						2	X	2	4		
103.860	4541	SHLDR		X							X			15	RT SHLDR
103.817	4314	DL		X						2	X	2	4		
103.789	4166	PL		X						2	X	2	4		
103.789	4166	DL		X						2	X	2	4		
103.777	4103	PL		X						6	X	2	12		
103.768	4055	DL		X						2	X	2	4		
103.764	4034	DL	21	X	12	28	66	20	12		X		-		
103.742	3918	PL		X						2	X	2	4		
103.737	3891	DL		X						2	X	3	6		ON RETROFIT
103.737	3891	DL		X						2	X	2	4		
103.704	3717	PL		X						2	X	2	4		

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Southbound
Data Table
RP 103.704 to RP 104.471

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	15

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
103.684	3612	DL		X					2	X	2	4			
103.656	3464	PL		X					2	X	2	4			
103.643	3395	DL		X					2	X	2	4			
103.640	3379	PL		X					2	X	2	4			
103.640	3379	DL		X					2	X	2	4			
103.627	3311	DL		X					4	X	2	8		ON RETROFIT	
103.581	3068	DL		X					2	X	2	4			
103.578	3052	DL		X					2	X	2	4			
103.576	3041	DL		X					2	X	2	4			
103.574	3031	DL		X					2	X	2	4			
103.565	2983	DL/PL		X					2	X	4	8			
103.560	2957	DL		X					2	X	2	4			
103.558	2946	DL/PL		X					2	X	4	8			
103.558	2946	PL		X					7	X	2	14			
103.558	2946	PL		X					2	X	2	4			
103.545	2878	DL		X					2	X	2	4			
103.533	2814	DL		X					2	X	2	4			
103.529	2793	DL		X					2	X	2	4			
103.515	2719	DL		X					2	X	2	4			
103.499	2635	DL		X					2	X	2	4			
103.473	2497	DL		X					2	X	2	4			
103.473	2497	DL		X					2	X	2	4			
103.471	2487	DL		X					2	X	2	4			
103.450	2376	DL		X					2	X	2	4			
103.450	2376	DL		X					2	X	2	4			
103.442	2334	DL		X					2	X	2	4			
103.440	2323	DL		X					2	X	2	4			
103.437	2307	DL		X					4	X	2	8		ON RETROFIT	
103.427	2255	DL		X					4	X	2	8		ON RETROFIT	
103.424	2239	DL		X					2	X	2	4			
103.419	2212	DL		X					2	X	12	24		ON RETROFIT	
103.416	2196	DL		X					2	X	6	12		ON RETROFIT	
103.414	2186	DL		X					2	X	2	4			
103.399	2107	DL		X					2	X	2	4			
103.399	2107	DL		X					2	X	2	4			
103.391	2064	PL		X					4	X	2	8			

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Southbound
Data Table
RP 103.391 to RP 103.684

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	16

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
103.379	2001	DL		X					2	X	2	4			
103.368	1943	PL		X					2	X	2	4			
103.368	1943	DL		X					2	X	2	4			
103.363	1917	DL		X					4	X	2	8		ON RETROFIT	
103.360	1901	PL		X					2	X	2	4			
103.358	1890	DL		X					4	X	2	8		ON RETROFIT	
103.352	1859	DL		X					2	X	2	4			
103.345	1822	DL		X					2	X	2	4			
103.342	1806	DL		X					2	X	2	4			
103.334	1764	DL		X					2	X	2	4			
103.329	1737	DL		X					2	X	2	4			
103.327	1727	DL		X					2	X	2	4			
103.324	1711	DL		X					2	X	2	4			
103.319	1684	PL		X					2	X	2	4			
103.317	1674	PL		X					2	X	2	4			
103.317	1674	DL		X					2	X	2	4			
103.311	1642	DL		X					2	X	2	4			
103.309	1632	DL		X					2	X	2	4			
103.307	1621	DL		X					2	X	2	4			
103.307	1621	DL		X					2	X	2	4			
103.304	1605	DL		X					2	X	2	4			
103.293	1547	PL		X					2	X	2	4			
103.293	1547	DL		X					2	X	2	4			
103.293	1547	DL		X					2	X	2	4			
103.283	1494	PL		X					2	X	2	4			
103.273	1441	DL		X					4	X	2	8		ON RETROFIT	
103.273	1441	DL		X					2	X	2	4			
103.268	1415	CL		X					4	X	4	16		TRANS/LONGITUDINAL	
103.255	1346	DL		X					2	X	6	12		ON RETROFIT	
103.252	1331	DL		X					2	X	12	24		ON RETROFIT	
103.229	1209	DL		X					2	X	2	4			
103.221	1167	PL		X					4	X	2	8			
103.216	1140	DL		X					2	X	2	4			
103.211	1114	DL		X					2	X	2	4			
103.211	1114	DL		X					2	X	2	4			
103.201	1061	DL		X					2	X	2	4			

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Southbound
Data Table
RP 103.201 to RP 103.379

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	17

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
103.199	1051	DL		X					2	X	2	4			
103.194	1024	DL		X					2	X	2	4			
103.184	972	DL		X					2	X	2	4			
103.181	956	DL		X					2	X	2	4			
103.173	913	DL		X					2	X	2	4			
103.171	903	DL		X					2	X	2	4			
103.171	903	DL		X					2	X	2	4			
103.159	840	DL		X					2	X	2	4			
103.155	818	DL		X					2	X	2	4			
103.135	713	DL		X					2	X	2	4			
103.117	618	DL		X					2	X	2	4			
103.115	607	DL		X					2	X	2	4			
103.103	544	PL	21	X	12	28	66	20	12		X				
103.081	428	DL		X					2	X	2	4			
103.076	401	DL		X					2	X	2	4			
103.073	385	DL		X					2	X	2	4			
103.055	290	DL		X					2	X	2	4			
103.050	264	DL		X					2	X	2	4			
103.043	227	DL		X					2	X	2	4			
103.040	211	DL		X					2	X	2	4			
103.035	185	DL		X					2	X	2	4			
103.004	21	DL		X					2	X	2	4			
SUBTOTAL						57	146	44	24			540	15		
102.984	5196	DL		X					2	X	2	4			
102.974	5143	PL		X					2	X	2	4			
102.971	5127	DL		X					4	X	2	8		ON RETROFIT	
102.971	5127	DL		X					2	X	2	4			
102.959	5064	DL		X					2	X	2	4			
102.946	4995	DL		X					2	X	2	4			
102.946	4995	DL		X					2	X	2	4			
102.938	4953	DL		X					2	X	2	4			
102.938	4953	DL		X					2	X	2	4			
102.935	4937	DL		X					2	X	2	4			
102.894	4720	DL		X					2	X	2	4			
102.887	4683	PL		X					2	X	2	4			
102.882	4657	DL		X					2	X	2	4			
102.864	4562	DL		X					2	X	2	4			

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Southbound
Data Table
RP 102.864 to RP 103.199

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	18

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
102.864	4562	DL		X					2	X	2	4			
102.856	4520	DL		X					2	X	2	4			
102.851	4493	PL		X					2	X	4	8			
102.851	4493	DL		X					2	X	2	4			
102.849	4483	DL		X					2	X	2	4			
102.843	4451	DL		X					2	X	12	24		TRANS JOINT ON RETROFIT	
102.826	4361	DL		X					2	X	2	4			
102.820	4330	DL		X					2	X	2	4			
102.802	4235	PL		X					2	X	2	4			
102.799	4219	DL	21	X	4	9	50	4		X				SHLDR JOINT/SPOT FULL DEPTH	
102.782	4129	DL		X					4	X	2	8			
102.765	4039	SHLDR		X					2	X	2	4		RT SHLDR	
102.759	4008	DL		X					2	X	2	4			
102.756	3992	DL		X					2	X	2	4			
102.751	3965	PL		X					2	X	2	4			
102.751	3965	DL		X					2	X	2	4			
102.748	3949	DL		X					2	X	2	4			
102.748	3949	PL		X					2	X	2	4			
102.744	3928	DL		X					2	X	2	4			
102.738	3897	DL	66	X	12	88	156	20	48	X					
102.734	3876	DL		X					2	X	2	4			
102.734	3876	DL		X					2	X	2	4			
102.710	3749	DL		X					2	X	2	4			
102.687	3627	DL		X					2	X	2	4			
102.680	3590	SHLDR		X						X			10	RT SHLDR	
102.669	3532	DL		X					2	X	2	4			
102.664	3506	DL		X					2	X	2	4			
102.662	3495	DL		X					2	X	2	4			
102.652	3443	PL		X					2	X	2	4			
102.628	3316	DL		X					2	X	2	4			
102.617	3258	DL		X					2	X	2	4			
102.612	3231	DL		X					2	X	2	4			
102.606	3200	SHLDR		X						X			45	RT SHLDR	
102.604	3189	DL		X					2	X	2	4			
102.597	3152	DL		X					2	X	2	4			
102.597	3152	DL		X					2	X	2	4			

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Southbound
Data Table
RP 102.597 to RP 102.864

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	19

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
102.594	3136	DL		X						2	X	2	4		
102.579	3057	DL		X						2	X	2	4		
102.556	2936	DL		X						2	X	2	4		
102.553	2920	DL		X						2	X	2	4		
102.543	2867	DL		X						2	X	2	4		
102.535	2825	DL		X						2	X	2	4		
102.527	2783	DL		X						2	X	2	4		
102.527	2783	DL		X						2	X	2	4		
102.525	2772	DL		X						2	X	2	4		
102.488	2577	PL	7	X	12	9	38	20			X				
102.469	2476	DL		X						2	X	2	4		
102.469	2476	DL		X						2	X	2	4		
102.466	2460	DL		X						2	X	2	4		
102.464	2450	PL	34	X	12	45	92	20	12		X				OVER PIPE(Reinf Mat)
102.464	2450	DL	34	X	12	45	92	20	12		X		-		OVER PIPE(Reinf Mat)
102.463	2445	DL		X						2	X	2	4		
102.463	2445	PL		X						2	X	2	4		
102.463	2445	PL/SHLD		X							X		16		LT SHLDR
102.460	2429	PL	21	X	12	28	66	20	12		X		4		LT SHLDR
102.450	2376	DL		X						2	X	2	4		
102.446	2355	DL		X						2	X	2	4		
102.435	2297	DL		X						2	X	2	4		
102.435	2297	DL		X						2	X	2	4		
102.433	2286	DL		X						2	X	12	24		TRANS JOINT ON RETROFIT
102.411	2170	DL		X						15	X	2	30		ALONG SHLDR JOINT
102.409	2160	DL		X						4	X	2	8		
102.397	2096	PL		X						2	X	2	4		
102.394	2080	DL		X						2	X	2	4		
102.376	1985	DL		X						2	X	2	4		
102.358	1890	DL		X						4	X	2	8		ON RETROFIT
102.346	1827	DL		X						2	X	2	4		
102.346	1827	DL		X						2	X	2	4		
102.328	1732	DL		X						2	X	2	4		
102.323	1705	DL		X						2	X	2	4		
102.320	1690	DL		X						2	X	2	4		
102.317	1674	DL		X						2	X	2	4		

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Southbound
Data Table
RP 102.317 to RP 102.594

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	20

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
102.305	1610	DL		X					2	X	2	4			
102.300	1584	DL		X					2	X	2	4			
102.286	1510	DL		X					2	X	2	4			
102.271	1431	DL		X					3	X	2	6		ON RETROFIT	
102.271	1431	PL		X					2	X	2	4			
102.267	1410	DL		X					2	X	2	4			
102.254	1341	DL		X					2	X	2	4			
102.244	1288	DL		X					2	X	2	4			
102.236	1246	DL		X					2	X	2	4			
102.235	1241	SHLDR		X						X			75	RT SHLDR	
102.233	1230	PL		X					2	X	2	4			
102.231	1220	DL		X					2	X	2	4			
102.223	1177	DL		X					2	X	2	4			
102.223	1177	DL		X					2	X	2	4			
102.208	1098	DL		X					2	X	2	4			
102.208	1098	DL		X					2	X	2	4			
102.205	1082	DL		X					2	X	2	4			
102.198	1045	DL		X					2	X	2	4			
102.196	1035	DL		X					15	X	2	30			
102.181	956	SHLDR		X						X			75	RT SHLDR	
102.172	908	DL		X					2	X	2	4			
102.165	871	SHLDR		X						X			10	RT SHLDR	
102.161	850	DL		X					2	X	2	4			
102.141	744	DL		X					2	X	2	4			
102.123	649	DL		X					2	X	2	4			
102.122	644	SHLDR		X						X			105	RT SHLDR	
102.120	634	DL		X					2	X	2	4			
102.100	528	DL		X					2	X	2	4			
102.095	502	DL		X					2	X	2	4			
102.082	433	DL		X					2	X	2	4			
102.066	348	DL		X					2	X	2	4			
102.064	338	DL		X					2	X	2	4			
102.058	306	DL	21	X	12	28	66	20		X					
102.036	190	DL		X					2	X	2	4			
102.008	42	DL		X					2	X	2	4			
102.000	0	DL		X					2	X	2	4			
SUBTOTAL MILE 102						253	560	124	96			546	340		

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Southbound
Data Table
RP 102.000 to RP 102.305

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	21

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
101.997	5264	DL		X						2	X	2	4		
101.994	5248	DL		X						2	X	2	4		
101.994	5248	DL		X						2	X	2	4		
101.984	5196	DL		X						2	X	2	4		
101.984	5196	DL		X						2	X	2	4		
101.977	5159	DL		X						2	X	2	4		
101.972	5132	DL		X						2	X	2	4		
101.969	5116	DL		X						2	X	2	4		
101.946	4995	DL		X						2	X	2	4		
101.943	4979	DL		X						2	X	4	8		ON RETROFIT
101.933	4926	DL		X						2	X	2	4		
101.926	4889	DL		X						2	X	2	4		
101.915	4831	DL		X						4	X	2	8		ON RETROFIT
101.910	4805	DL		X						2	X	2	4		
101.905	4778	PL		X						2	X	2	4		
101.879	4641	DL	21	X	12	28	66	20	12		X				
101.867	4578	DL		X						2	X	2	4		
101.861	4546	DL		X						2	X	2	4		
101.851	4493	DL		X						2	X	2	4		
101.846	4467	DL		X						2	X	2	4		
101.843	4451	DL		X						2	X	2	4		
101.833	4398	DL		X						2	X	2	4		
101.830	4382	DL		X						2	X	2	4		
101.823	4345	DL		X						2	X	2	4		
101.823	4345	DL		X						2	X	2	4		
101.818	4319	DL		X						2	X	2	4		
101.799	4219	PL		X						2	X	2	4		
101.795	4198	DL		X						2	X	2	4		
101.779	4113	DL		X						2	X	2	4		
101.771	4071	DL		X						2	X	2	4		
101.761	4018	DL		X						2	X	2	4		
101.758	4002	DL		X						2	X	2	4		
101.754	3981	PL		X						2	X	2	4		
101.737	3891	DL		X						2	X	2	4		
101.733	3870	DL		X						2	X	2	4		
101.730	3854	DL		X						2	X	2	4		

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Southbound
Data Table
RP 101.730 to RP 101.997

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	22

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
101.717	3786	PL		X						2	X	2	4		
101.717	3786	DL		X						2	X	2	4		
101.682	3601	DL		X						4	X	2	8		ON RETROFIT
101.679	3585	PL		X						2	X	2	4		
101.672	3548	DL		X						2	X	2	4		
101.668	3527	DL		X						2	X	2	4		
101.666	3516	DL		X						2	X	2	4		
101.659	3480	DL		X						2	X	2	4		
101.648	3421	DL		X						2	X	2	4		
101.646	3411	DL		X						2	X	2	4		
101.639	3374	PL	21	X	12	28	66	20	12		X				
101.615	3247	DL		X						2	X	2	4		
101.615	3247	DL		X						2	X	2	4		
101.613	3237	DL		X						2	X	2	4		
101.610	3221	DL		X						4	X	2	8		ON RETROFIT
101.600	3168	DL		X						2	X	2	4		
101.600	3168	DL		X						2	X	2	4		
101.589	3110	DL		X						2	X	2	4		
101.575	3036	PL		X						2	X	2	4		
101.570	3010	PL		X						2	X	2	4		
101.563	2973	DL		X						2	X	2	4		
101.559	2952	DL		X						2	X	2	4		
101.538	2841	DL		X						2	X	2	4		
101.528	2788	DL		X						4	X	2	8		ON RETROFIT
101.523	2761	DL		X						4	X	2	8		ON RETROFIT
101.518	2735	DL		X						2	X	2	4		
101.487	2571	DL		X						2	X	2	4		
101.487	2571	DL		X						2	X	2	4		
101.477	2519	DL		X						2	X	2	4		
101.467	2466	SHLDR		X							X			45	RT SHLDR
101.461	2434	DL		X						2	X	2	4		
101.451	2381	DL		X						2	X	2	4		
101.441	2328	DL		X						2	X	3	6		ON RETROFIT
101.436	2302	DL		X						4	X	2	8		ON RETROFIT
101.420	2218	DL		X						4	X	2	8		ON RETROFIT
101.394	2080	DL		X						7	X	2	14		

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Southbound
Data Table
RP 101.394 to RP 101.717

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	23

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
101.390	2059	SHLDR		X						X			15	RT SHLDR	
101.359	1896	DL		X						2	X	2	4		
101.348	1837	DL		X						2	X	2	4		
101.283	1494	DL		X						2	X	2	4		
101.246	1299	DL	4	X	4	2	16	1			X			ON RETROFIT	
101.235	1241	PL	21	X	12	28	66	20	12		X				
101.228	1204	DL		X						4	X	2	8	ON RETROFIT	
101.220	1162	DL		X						4	X	2	8	ON RETROFIT	
101.211	1114	DL		X						2	X	2	4		
101.202	1067	DL		X						2	X	2	4		
101.194	1024	DL		X						2	X	2	4		
101.192	1014	DL		X						4	X	2	8	ON RETROFIT	
101.187	987	DL		X						2	X	2	4		
101.182	961	DL		X						4	X	2	8	ON RETROFIT	
101.174	919	DL		X						2	X	2	4		
101.171	903	DL		X						2	X	2	4		
101.161	850	DL		X						4	X	2	8	ON RETROFIT	
101.149	787	DL		X						2	X	2	4		
101.138	729	DL		X						2	X	2	4		
101.138	729	DL		X						2	X	2	4		
101.133	702	DL		X						2	X	2	4		
101.128	676	SHLDR		X							X		60	RT SHLDR	
101.123	649	DL		X						2	X	2	4		
101.120	634	DL		X						2	X	2	4		
101.118	623	DL		X						2	X	2	4		
101.110	581	DL		X						2	X	2	4		
101.108	570	DL		X						2	X	2	4		
101.105	554	DL		X						4	X	2	8	ON RETROFIT	
101.082	433	DL		X						2	X	2	4		
101.082	433	DL		X						2	X	2	4		
101.079	417	DL		X						2	X	2	4		
101.074	391	DL		X						2	X	2	4		
101.059	312	DL		X						2	X	2	4		
101.054	285	PL		X						2	X	2	4		
101.054	285	DL		X						2	X	2	4		
101.051	269	PL		X						2	X	2	4		

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Southbound
Data Table
RP 101.051 to RP 101.390

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SIM-8-029(137)100	11	24

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
101.038	201	DL		X						4	X	2	8		ON RETROFIT
101.036	190	DL		X						2	X	2	4		
101.028	148	DL		X						4	X	2	8		ON RETROFIT
101.026	137	DL		X						4	X	2	8		ON RETROFIT
101.020	106	DL		X						2	X	2	4		
101.002	11	DL		X						4	X	2	8		ON RETROFIT
SUBTOTAL						86	214	61	36				512	120	
100.971	5127	DL		X						2	X	2	4		
100.966	5100	DL		X						2	X	2	4		
100.961	5074	DL		X						2	X	2	4		
100.959	5064	DL		X						2	X	2	4		
100.949	5011	DL		X						4	X	2	8		ON RETROFIT
100.946	4995	DL		X						2	X	2	4		
100.933	4926	DL		X						2	X	2	4		
100.933	4926	DL		X						2	X	2	4		
100.925	4884	DL		X						2	X	2	4		
100.925	4884	DL		X						2	X	2	4		
100.922	4868	DL		X						2	X	2	4		
100.915	4831	DL		X						2	X	2	4		
100.899	4747	DL		X						2	X	2	4		
100.897	4736	PL		X						2	X	2	4		
100.894	4720	SHLDR		X							X			10	RT SHLDR
100.892	4710	DL		X						2	X	12	24		TRANS JOINT ON RETROFIT
100.881	4652	DL		X						2	X	3	6		ON RETROFIT
100.838	4425	DL		X						2	X	2	4		
100.794	4192	DL		X						2	X	2	4		
100.794	4192	DL		X						2	X	2	4		
100.763	4029	SHLDR		X						2	X	2	4		RT SHLDR
100.753	3976	DL		X						2	X	2	4		
100.750	3960	DL		X						4	X	2	8		ON RETROFIT
100.748	3949	DL		X						2	X	4	8		ON RETROFIT
100.728	3844	DL		X						2	X	2	4		
100.710	3749	PL		X						2	X	2	4		
100.707	3733	DL		X						2	X	2	4		
100.676	3569	DL		X						2	X	4	8		ON RETROFIT
100.666	3516	DL		X						4	X	2	8		ON RETROFIT
100.658	3474	PL		X						2	X	2	4		

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Southbound
Data Table
RP 100.658 to RP 100.971

Reference Point	Dist. From RP FT	Lane	Full Depth Repair (ft)			SY	Sawcut	Dowel Bars	Doweled Contr. Joint Assembly (LF)	Spall Repair (ft)			SF	Random Cracks (LF)	Comments
			Length	X	Width					Length	X	Width			
100.577	3047	GORE	2	X	8	2	20	8			X				GORE
100.545	2878	DL		X						2	X	2	4		
100.538	2841	DL		X						2	X	2	4		
100.535	2825	DL		X						2	X	2	4		
100.525	2772	DL		X						2	X	6	12		ALONG CL JOINT
100.510	2693	DL		X						2	X	2	4		
100.507	2677	DL		X						2	X	2	4		
100.502	2651	DL		X						2	X	3	6		
100.479	2529	DL		X						2	X	2	4		
100.469	2476	DL		X						2	X	2	4		
100.456	2408	DL		X						2	X	12	24		TRANS JOINT ON RETROFIT
100.431	2276	DL		X						2	X	2	4		
100.428	2260	DL		X						2	X	2	4		
100.413	2181	PL		X						2	X	2	4		
100.408	2154	DL		X						2	X	2	4		
100.402	2123	DL		X						2	X	2	4		
100.402	2123	DL		X						2	X	2	4		
100.384	2028	DL/PL		X						2	X	24	48		TRANS JOINT ON RETROFIT
100.382	2017	DL		X						2	X	2	4		
100.382	2017	DL		X						2	X	2	4		
100.351	1853	DL		X						2	X	2	4		
100.343	1811	DL		X						2	X	2	4		
100.330	1742	DL		X						2	X	2	4		
100.325	1716	DL		X						4	X	2	8		ON RETROFIT
100.312	1647	DL		X						2	X	2	4		
100.305	1610	DL		X						2	X	2	4		
100.302	1595	DL		X						2	X	2	4		
100.297	1568	DL		X						2	X	2	4		
100.289	1526	DL		X						2	X	2	4		
100.281	1484	DL		X						2	X	2	4		
100.279	1473	DL		X						2	X	2	4		
100.271	1431	DL		X						2	X	2	4		
100.221	1167	DL		X						2	X	2	4		
100.269	1420	PL		X						2	X	2	4		
100.258	1362	DL		X						2	X	2	4		
100.258	1362	DL		X						2	X	2	4		
100.255	1346	DL		X						2	X	2	4		
100.245	1294	DL		X						2	X	2	4		
100.243	1283	DL		X						2	X	2	4		
SUBTOTAL			2			2	20	8	0			388	10		

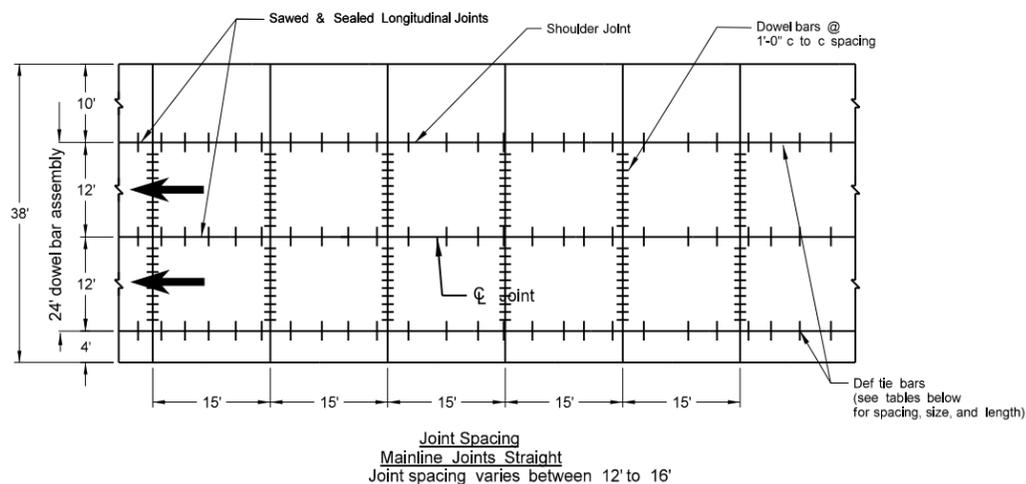
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Full Depth (SY)	Spot Full Depth	Sawcut (LF)	Dowel Bars (EA)	Doweled Contraction Joint Assembly (LF)	Spalls (SF)	Random Crack (LF)
1,675	365	3,819	973	648	3,958	6,187
2,010	438	4,583	1,168	778	4,750	7,424

W/ 20% Mark up

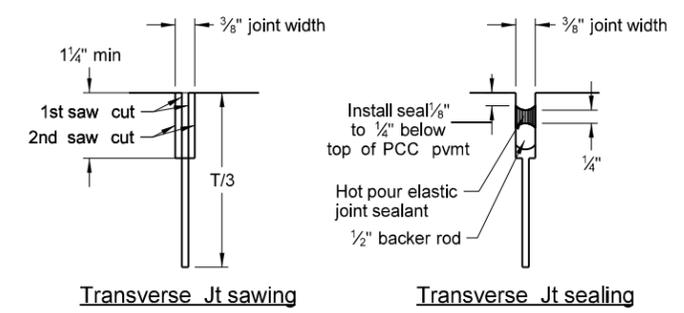
Southbound
Data Table
RP 100.243 to RP 100.577

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-8-029(137)100	20	1



- Notes:
1. T = Pavement Thickness
 2. Dowel bars shall be 1 1/4" x 18" when T = 10" or less and shall be 1 1/2" x 18" when T is greater than 10".
 3. The ramp tapers shall also be doweled
- *Width requirement for top 1" only. Bottom portion of saw cut may be narrower.

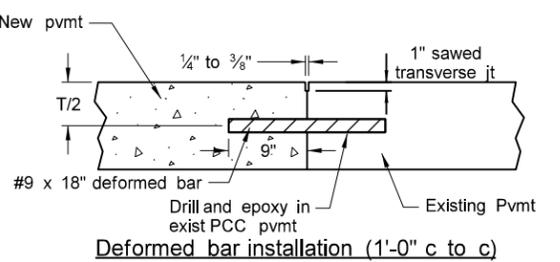
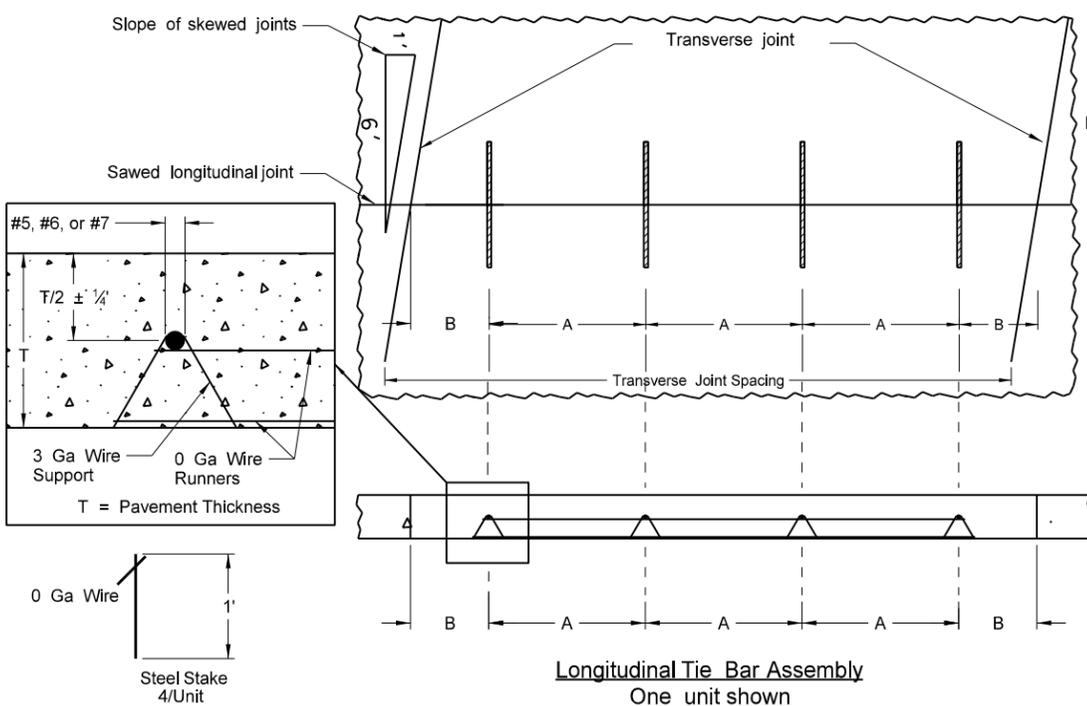
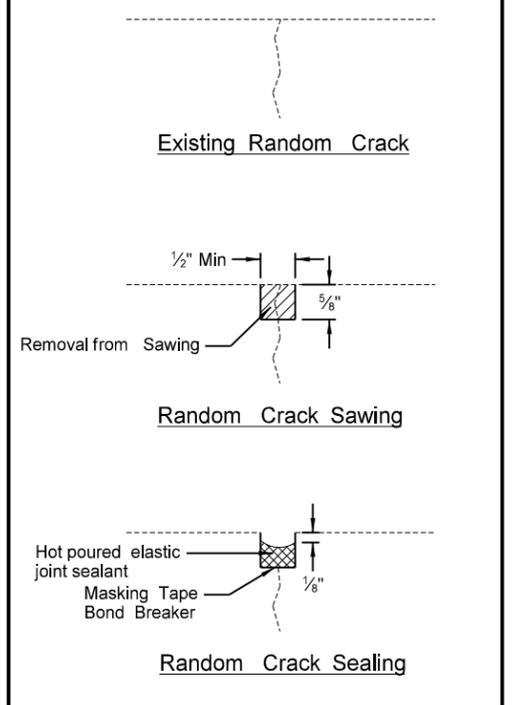
Joint Spacing
Mainline Joints Straight
Joint spacing varies between 12' to 16'



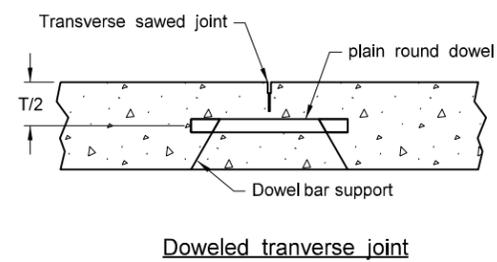
Transverse Jt sawing

Transverse Jt sealing

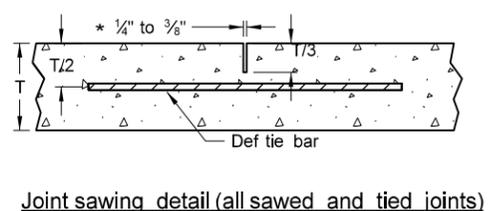
Random PCC Crack Cleaning & Sealing



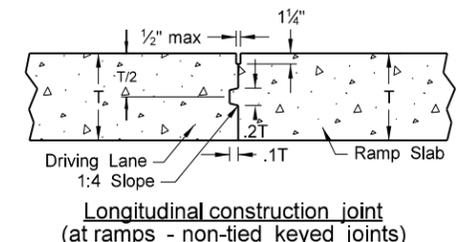
Deformed bar installation (1'-0" c to c)



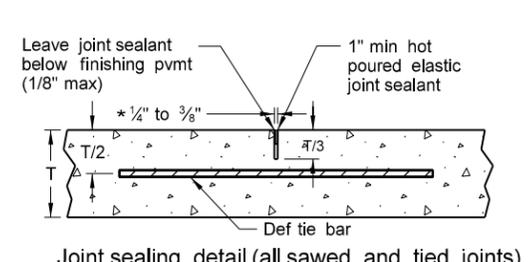
Doweled transverse joint



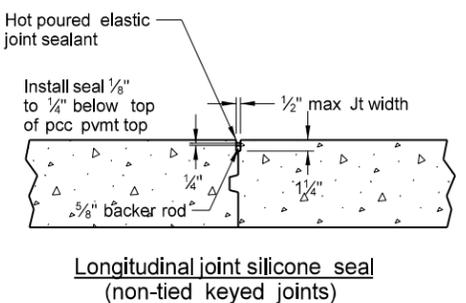
Joint sawing detail (all sawed and tied joints)



Longitudinal construction joint (at ramps - non-tied keyed joints)



Joint sealing detail (all sawed and tied joints)



Longitudinal joint silicone seal (non-tied keyed joints)

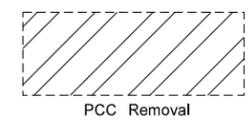
Longitudinal Joint Tie Bar Size and Length				
Pavement Depth	8"	9"	10"	11" 12"
ML & Ramps	#6 x 3' - 0"		#7 x 3' - 0"	
10' SHLDR	#5 x 2' - 6"			

Longitudinal Joint Uniform Tie Bar Spacing			
Joint Spacing	Distance A	Distance B	No. of Bars/Assembly
15'	45"	22 1/2"	4

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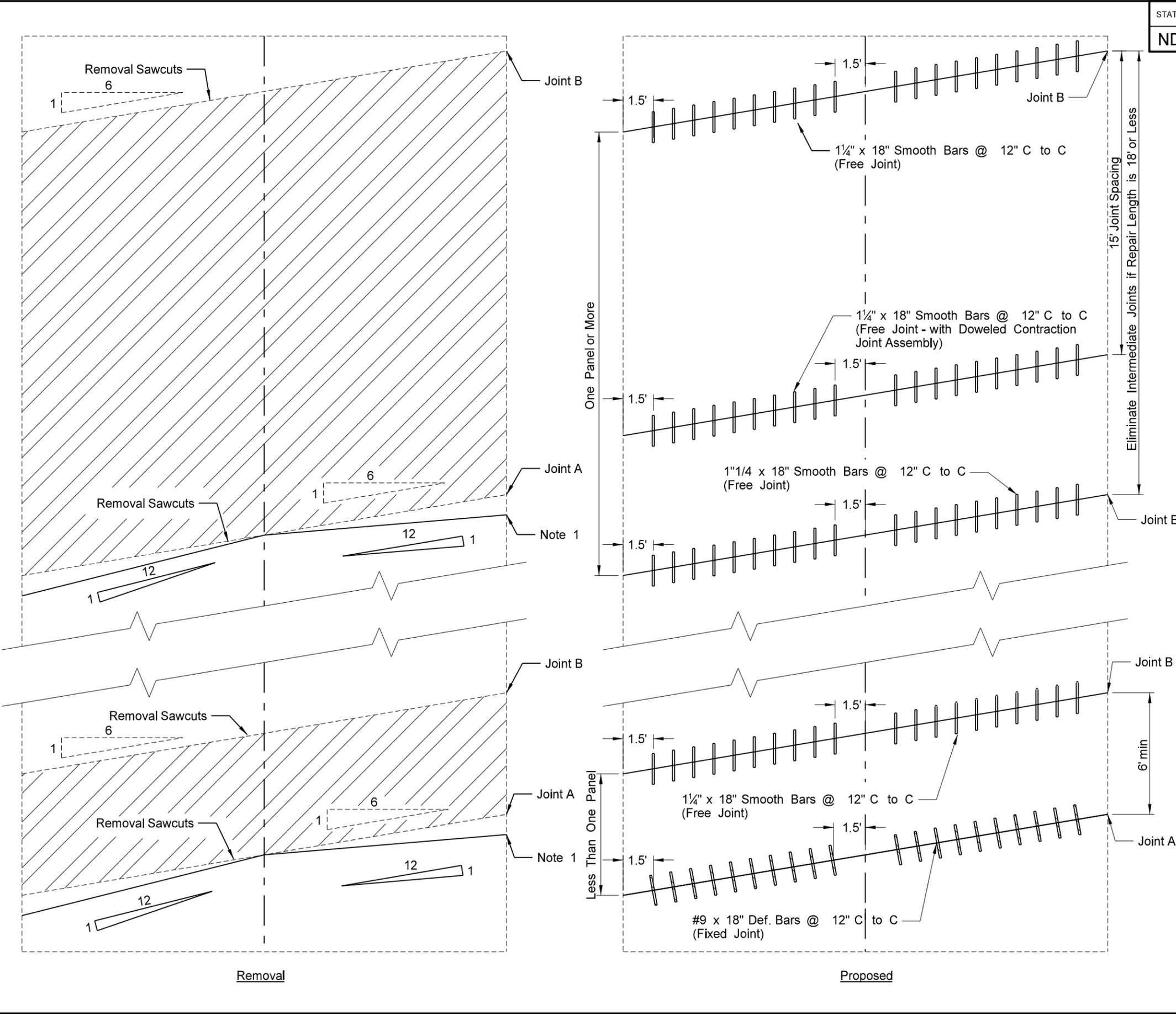
PCC Pavement Joint Details
With Uniform Spacing
Near Blanchard to ND Hwy 200

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SIM-8-029(137)100	20	2



Notes:

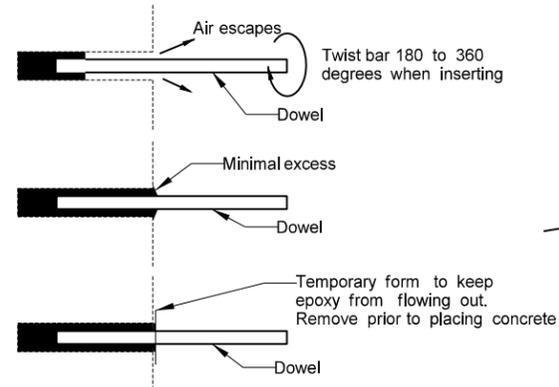
1. Joint A (Fixed Joint) shall be the new joint with the shortest distance to the next transverse joint or working random crack. The saw cut may be made at a 1:6 skew, or up to a maximum 1:12 skew referenced off the 1:6 skewed transverse joint. The deformed bars shall be placed perpendicular to the face of the saw cut.
2. Joint B (Free Joint) shall be the new joint with the greatest distance to the next transverse joint or working random crack. The smooth bars shall be installed within the tolerances shown on the "Dowel Bar Placement- Full Depth Repair" detail sheet.
3. When the distance to the next transverse joint or working random crack is equal for both new joints, the free joint (joint B) shall be placed on the approach side of the repair.
4. If greater than one panel in length, a Doweled Contraction Joint Assembly shall be installed at transverse contraction joints.
5. In repair areas which are not the entire roadway width, joints shall be placed to match the existing pavement wherever possible.
6. The joints at the beginning and end of a full depth repair section can be either a Joint B or Joint A depending on the existing joint.
7. Mainline joints are skewed except at bridge ends and old concrete repairs.



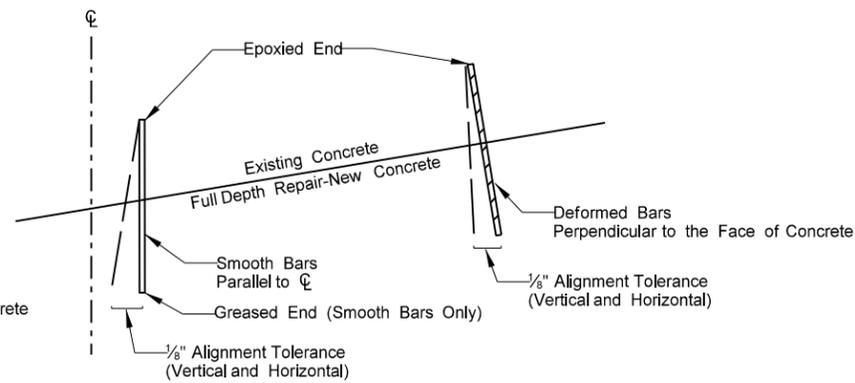
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Removal of Concrete & Dowel Bar Placement-Full Depth Repair Skewed Joint Near Blanchard to Jct 200-NB

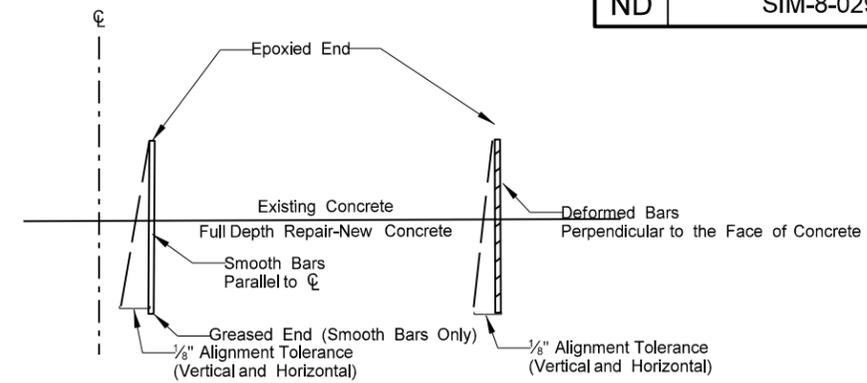
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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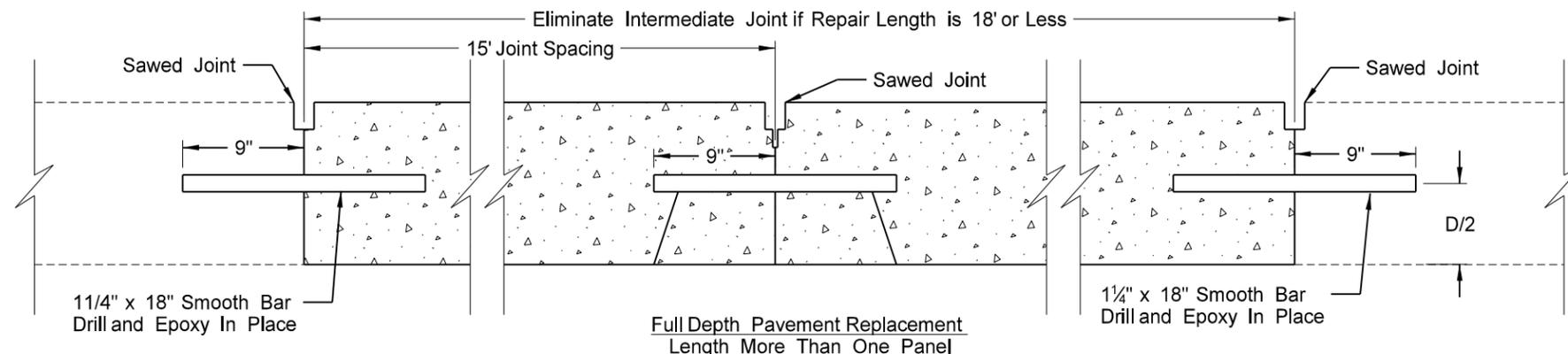
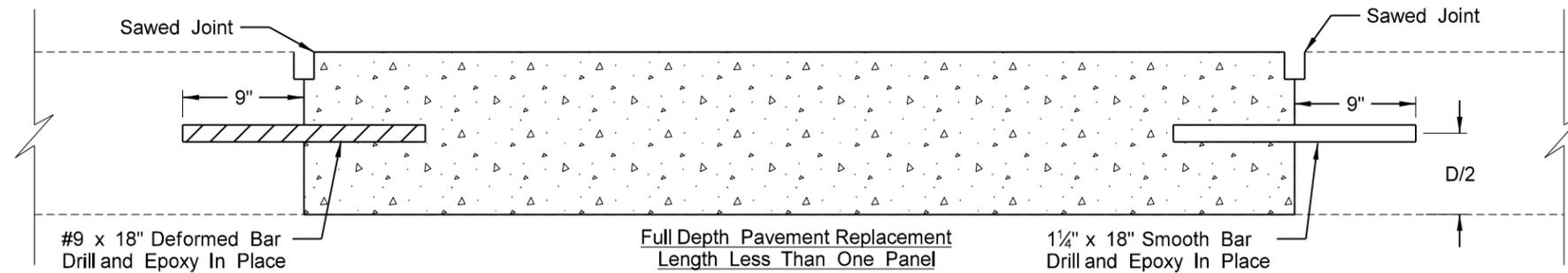
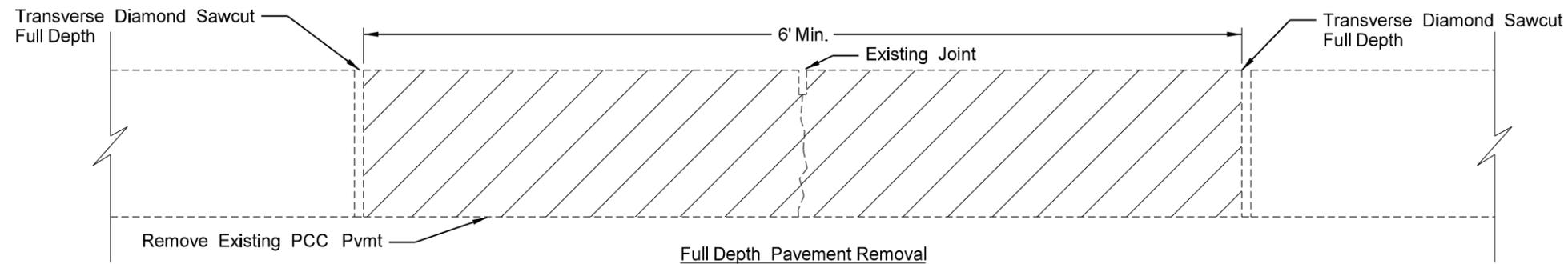
Dowel & Epoxy Installation
(Smooth or Deformed Bars)



Dowel Alignment Tolerance



Dowel Alignment Tolerance



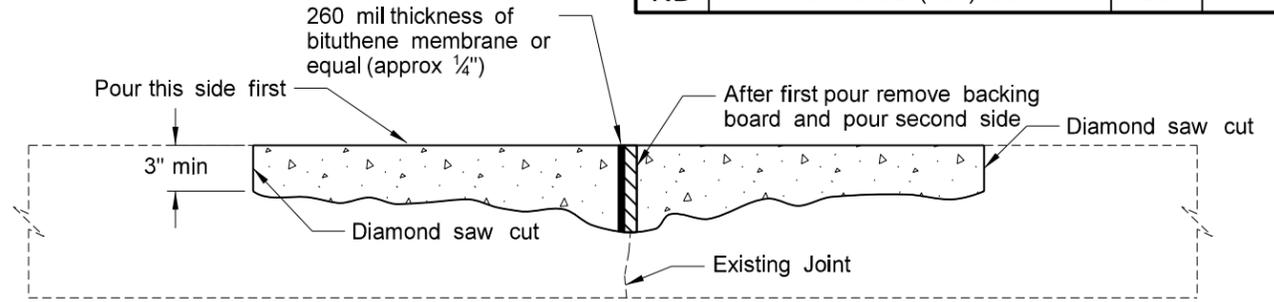
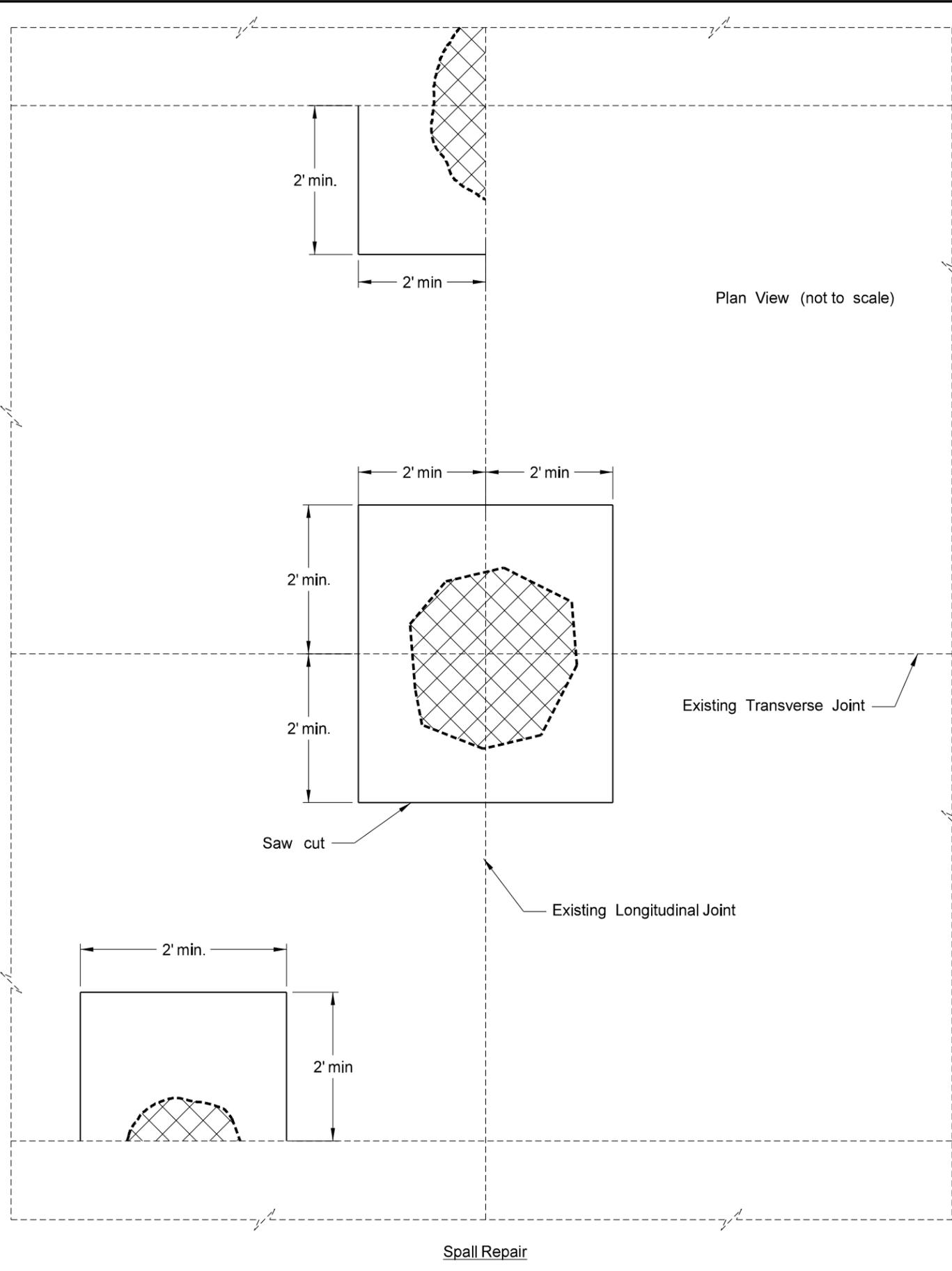
Notes:

- Variables:
D = Depth of Pavement
- Removal and replacement also applies to full depth repairs at cracks.
- Place smooth dowel bars in repair joint which is farthest away from the next transverse joint or working random crack. If distance is equal for both repair joints, place smooth dowels on approach side of patch.
- In full depth repair areas that fall within 3' of an existing joint, the repair area shall go beyond the joint by 3' to ensure all old doweled bars are removed.

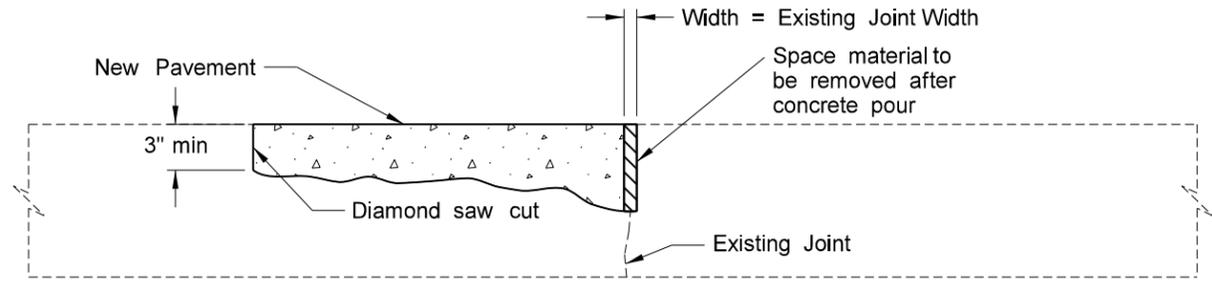
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Concrete Pavement Repair-Full Depth
Non-Reinforced PCC Pavement
Near Blanchard to Jct 200-NB

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Cross Section - Repair Area on Both Sides of the Joint



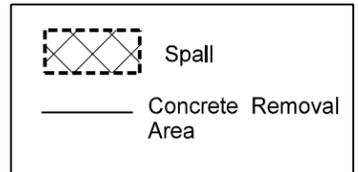
Cross Section - Repair Area on One Side of the Joint

Notes:

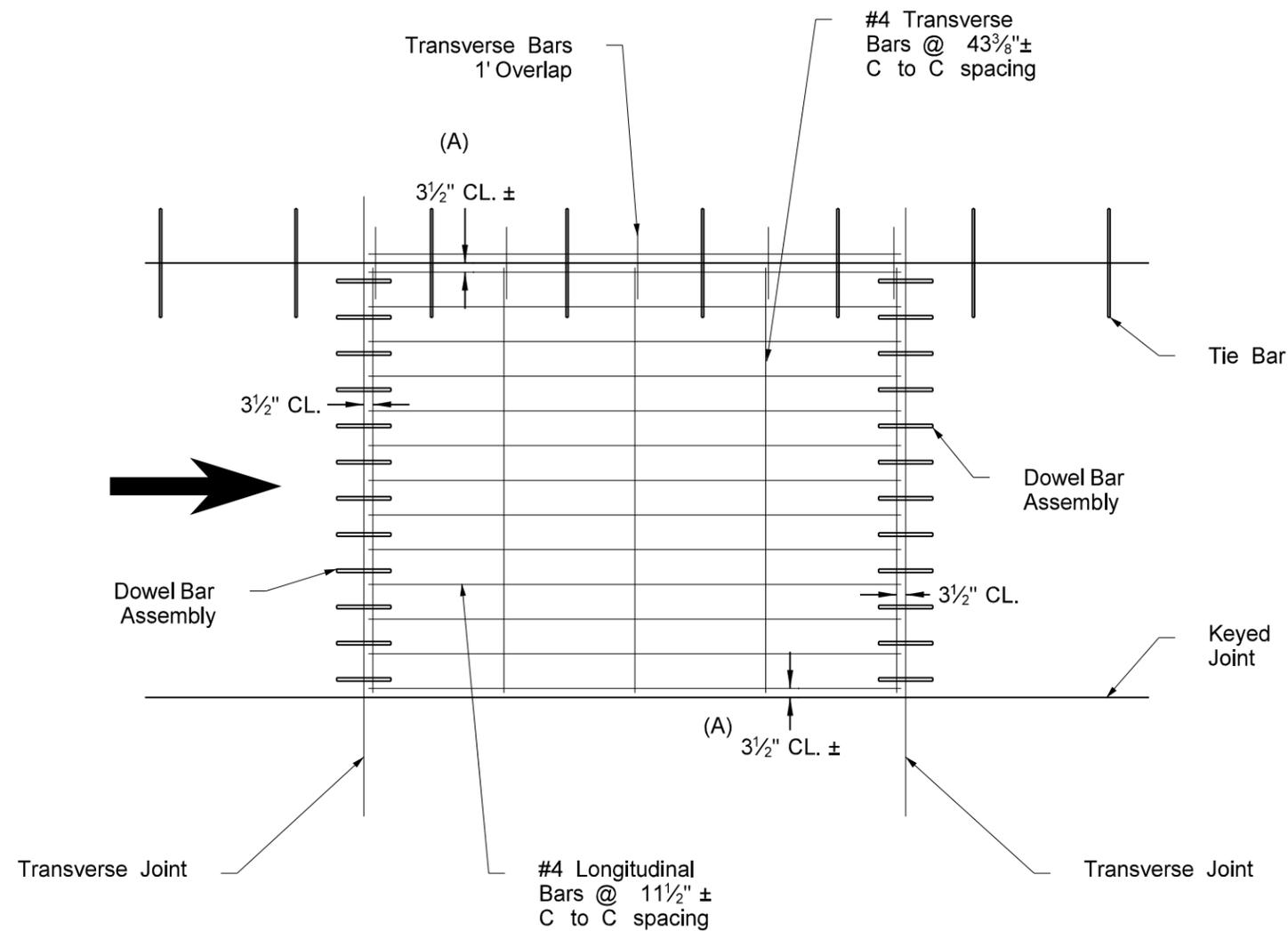
- Existing concrete shall be removed with a chipping hammer or other methods as approved by the engineer. The maximum size chipping hammer allowed shall be 15 pounds. A milling machine may be used, as approved by the engineer, but sawing and chipping will still be required to finish the removal and establish a vertical edge throughout the repair area.
- Grout shall be applied to the sides, and bottom of the repair area, excluding joint faces.
- A spacer material, as approved by the engineer, shall be placed on the joint face to maintain the joint during repair. The material shall have the capability of maintaining a width equal to that of the existing joint, and being easily removed after the pour. In the case of repair on both sides of the transverse joint each side shall be poured separately.
- In the case of repair on both sides of the joint, if deemed necessary by the engineer, a bituthene waterproofing membrane will be placed on the face of the newly poured joint in lieu of the spacer material prior to the concrete pour. The material shall be a minimum of 260 Mil (approximately 1/4") thick or equal to the width of the existing joint, whichever is larger. The material shall be cut to fit over the entire face of the existing joint. The material shall be placed to provide for expansion and to prevent water from entering the existing joint through the sides or bottom. The material shall be hand pressed into place to conform to the face of the existing joint. In the case of repair on both sides of the joint a backer board material, as approved by the engineer shall be placed over the bituthene material on the side facing the second pour prior to the 2nd pour. The backer board shall be removed after the repair is completed.

In the case of repair on one side of the joint, if deemed necessary by the engineer, a bituthene waterproofing membrane will be placed on the face of the existing joint in lieu of the spacer material and prior to the concrete pour.
- For spall repairs in areas where the joints are at 90°, the 2' min. sawcuts shall be perpendicular to the longitudinal and transverse joints.
- All joints shall be sealed according to NDDOT specifications.
- All costs for cleaning and sealing joints and any bituthene installment shall be covered under the bid item " Spall Repair - Partial Depth."

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Spall Repair Detail
Near Blanchard to ND 200 NB



(A) See Longitudinal Bar Spacings table for various panel widths.

NOTES:

1. Place reinforcing steel above dowel bars, above longitudinal centerline tie bars, and under shoulder tie bars.
2. A 1 foot minimum overlap of transverse reinforcing steel across the longitudinal tied joints shall be provided.
3. All costs to furnish and install the reinforcing steel as shown shall be included in the price bid for concrete pavement repair items.

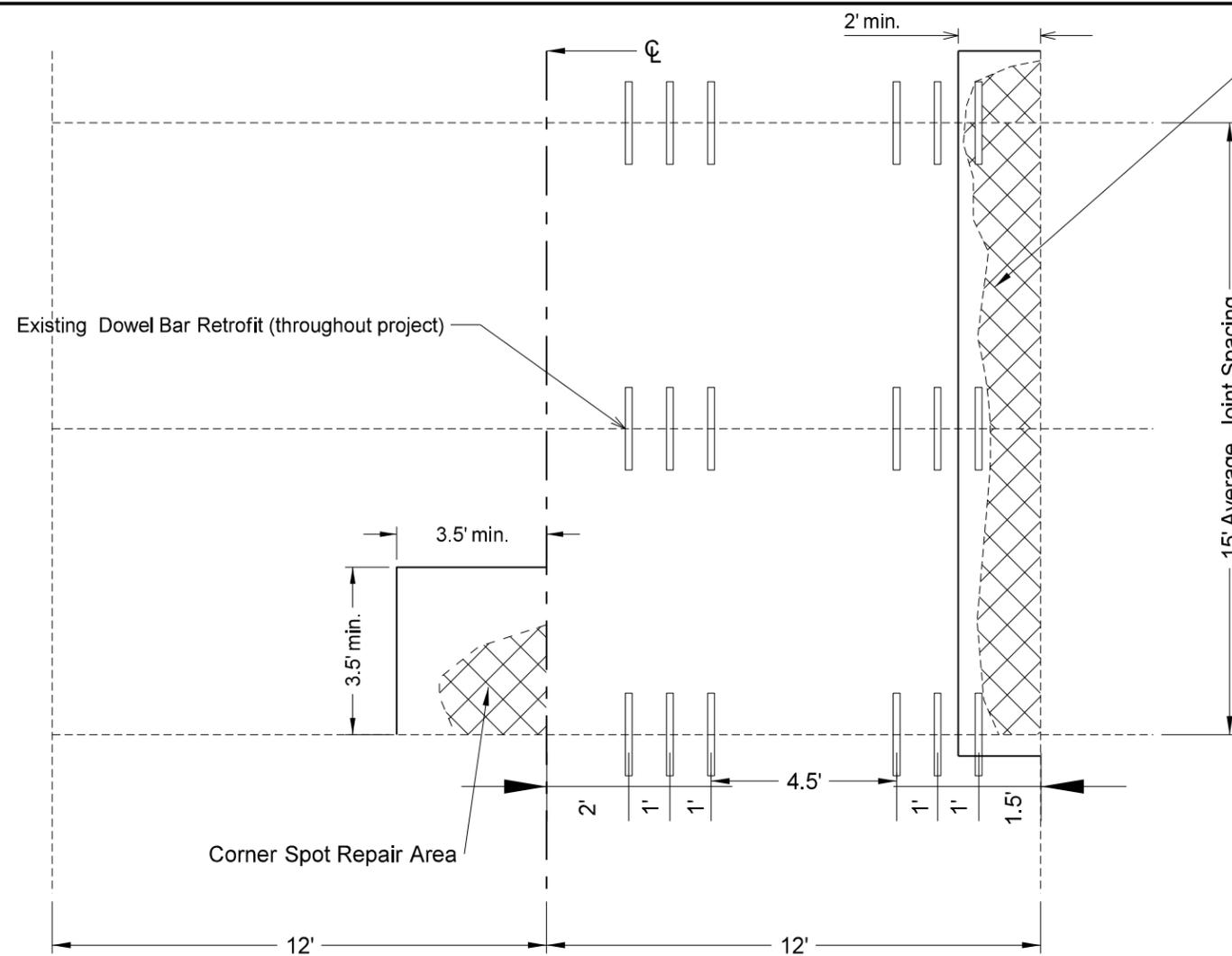
Detail A
Reinforcing Layout

Longitudinal Bar Spacings		
Panel Width	Longitudinal Bar Spacing	Bar Clearance, From Long. Joint
12'	11 ³ / ₈ "	3 ¹ / ₂ "
14'	11 ¹ / ₂ "	3 ¹ / ₄ "
16'	11 ¹ / ₂ "	3 ³ / ₄ "

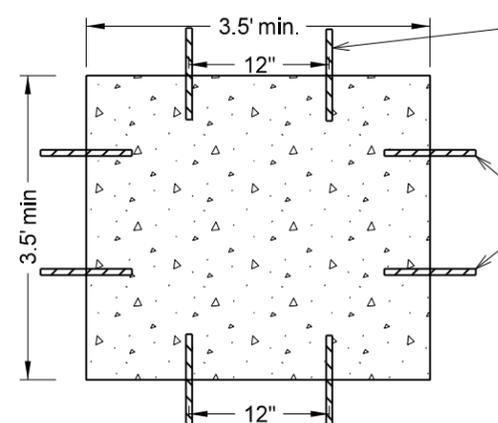
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Pavement Reinforcing Detail
At Pipe/Culvert Locations
Near Blanchard to ND Hwy 200 NB

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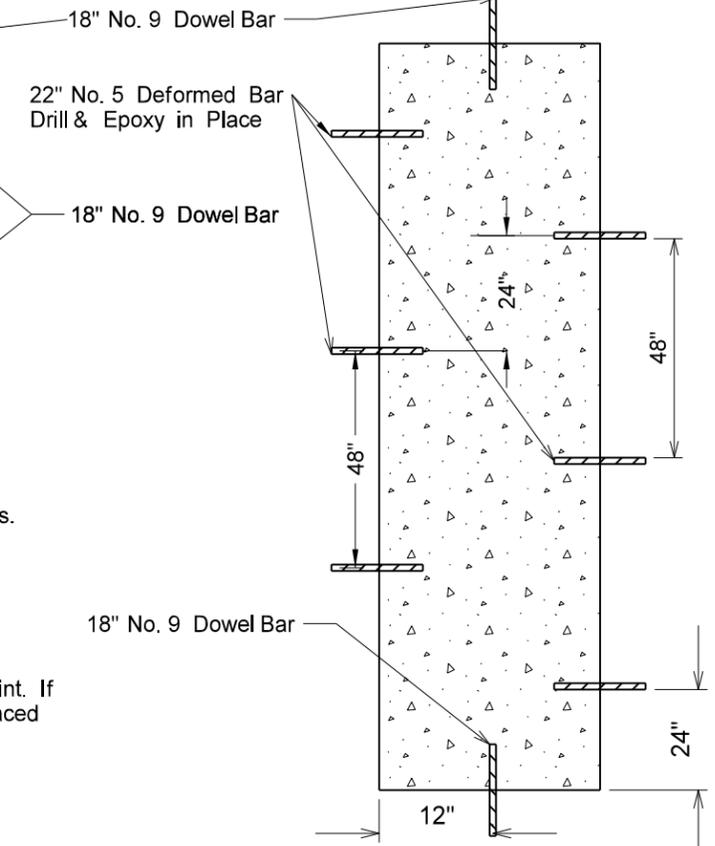


Longitudinal Spot Repair Area



Work to be Performed - Spot Repair

- Order of operations follow Longitudinal Repairs.
- Bar Placement:
 - Furnish and install 18" No. 9 deformed bars.
 - Transverse Edges: 12" c to c
 - Longitudinal Edges: Parallel to the transverse joint. If repair is less than 4' in length, use two bars spaced evenly. If longer, space at 24" c to c.
- Substitute smooth dowel bar if on existing transverse joint



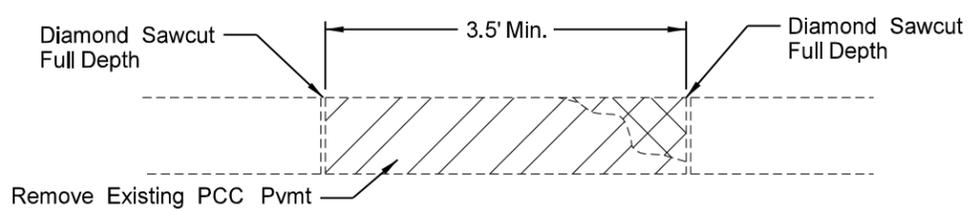
Work to be Performed - Longitudinal Repair

- Sawcut the marked removal area.
- Remove concrete full depth. Restore in place base if disturbed.
- Furnish and install 22" long No. 5 deformed bars. The spacing and layout shall be as follows:
 - Transverse Edges: 12" c to c
 - Longitudinal Edges: Parallel to the longitudinal joint. If 2' to 4' in length from a transverse joint, use two bars evenly spaced. If longer than 4' space at 48" c to c., staggered on each side of the repair as shown.
- Restore dowel bars if necessary. Use partial dowel bar assembly or drill holes as appropriate.
- Clean and wet exposed surface of in place concrete prior to placing new concrete.
- Place, consolidate, finish, and cure concrete.
- Restore transverse and longitudinal joints.
- Clean and seal restored longitudinal and transverse joints, all work stated here in to be included in the bid price for SPOT FULL DEPTH.

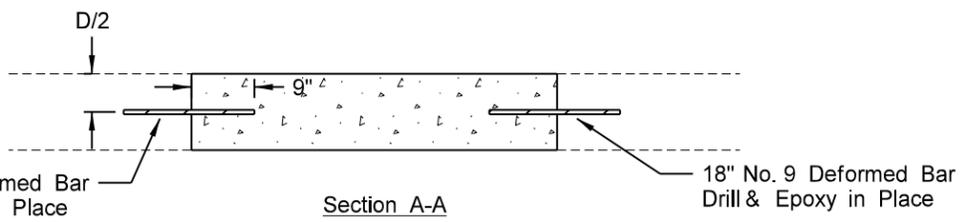
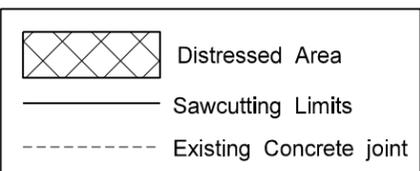
Longitudinal Spot Full Depth Repair Area
Edge of Driving Lane

Corner Spot Repair Area

Corner Spot Full Depth Repairs



Spot Full Depth Pavement Removal



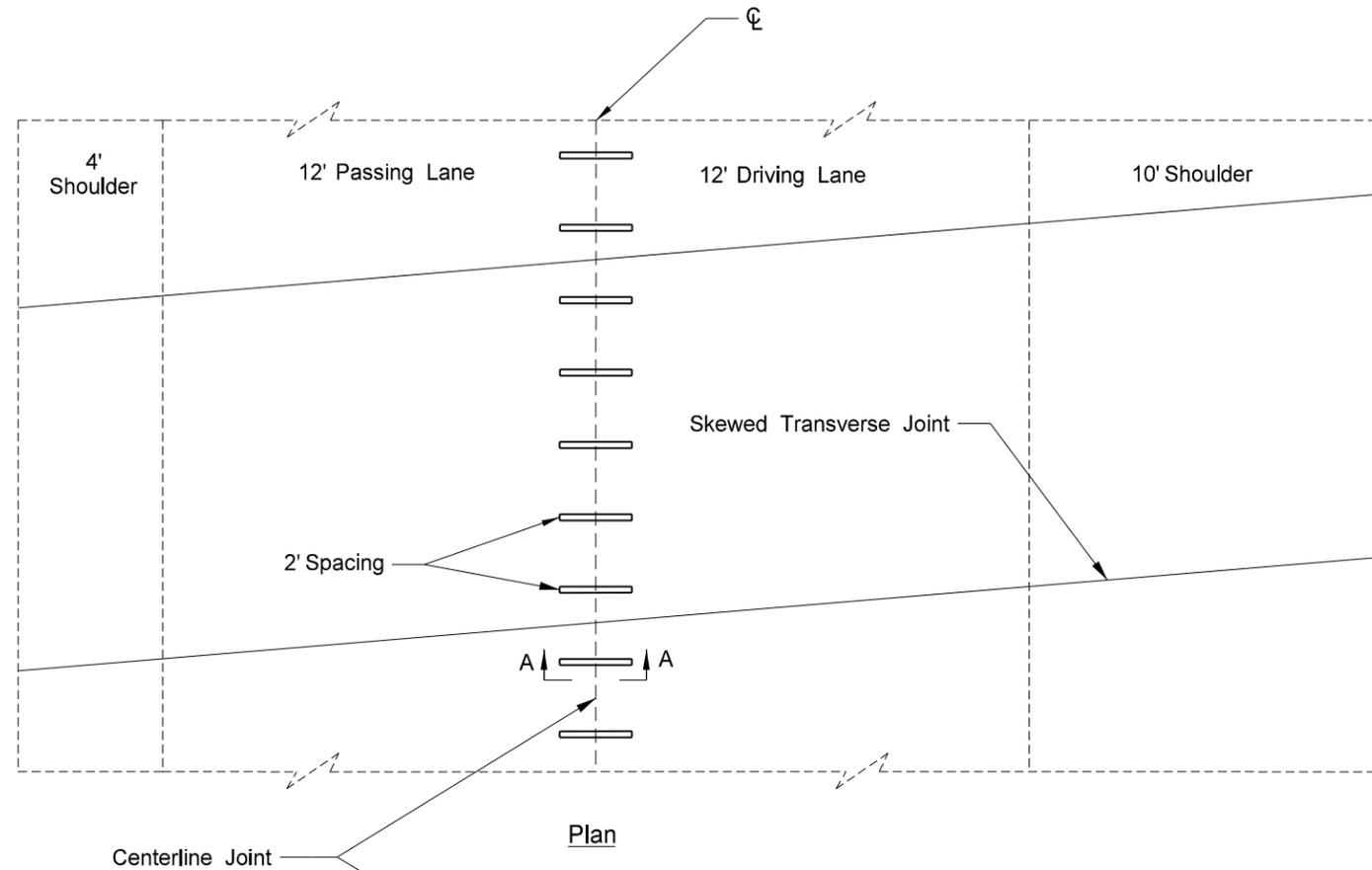
**Section A-A
Spot Full Depth Pavement Replacement**

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Spot Full Depth Pavement Replacement Detail
Near Blanchard to ND Hwy 200 NB

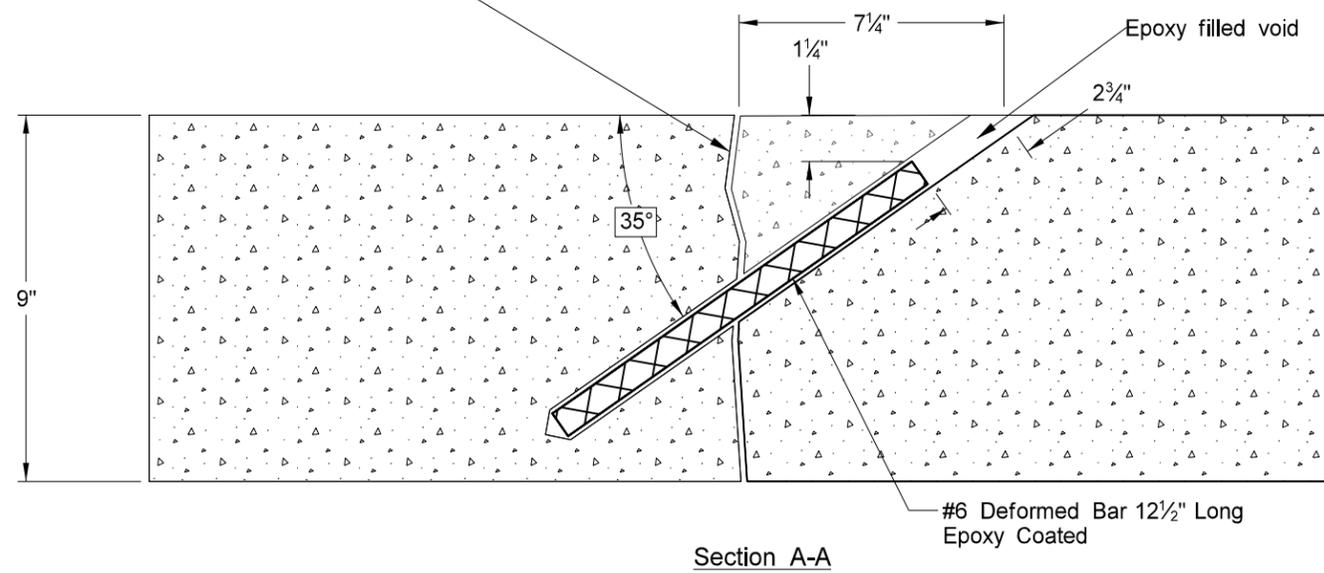
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Northbound Roadway
Stitching Locations



	DL FAULTING	Feet		CL SEPERATION	
RP	109.732-109.713	100.3	RP	107.373-107.003	1954
	109.452-109.436	84.5		105.250-104.625	3300
	108.690-108.507	966		104.546-104.261	1505
	107.499-107.473	137		104.106-103.950	824
	107.447-107.407	211		103.762-103.673	470
	107.373-107.003	1954		102.738-101.984	3981
	106.211-105.936	1452			
	102.738-101.984	3981			
	Total Length=1.683 miles	8885.8		Total Length=2.279 miles	12034

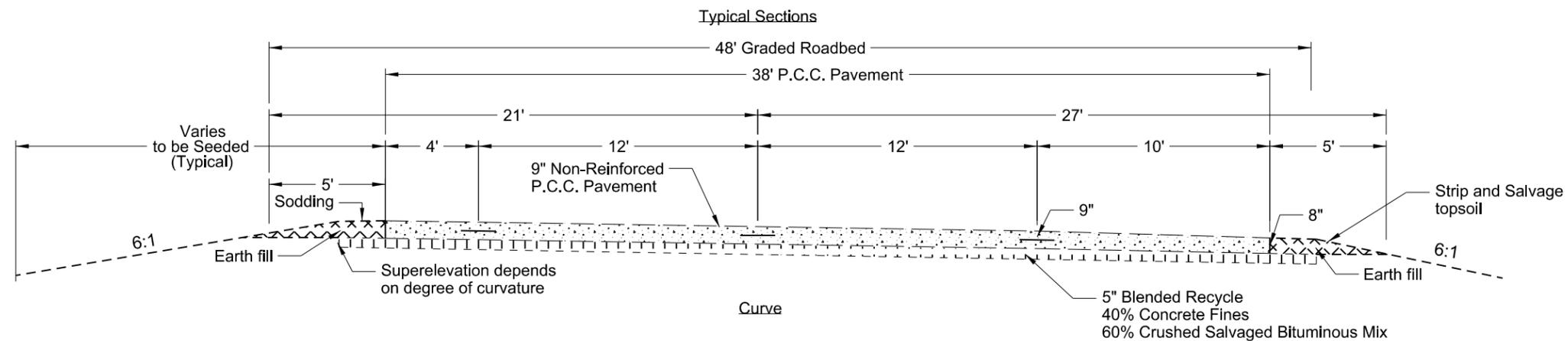
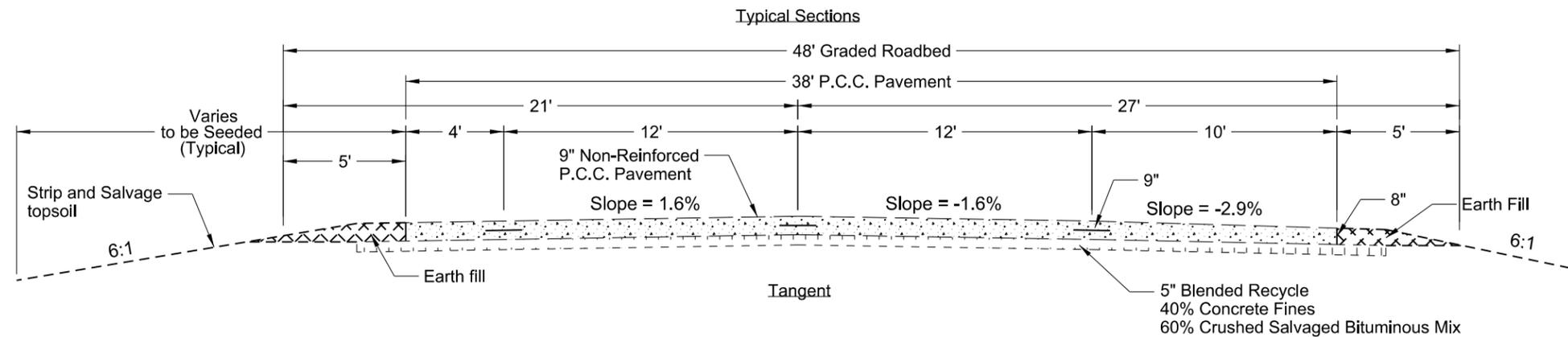
Epoxy Coated Deformed Bars
10,460 each @ 2ft spacing



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Random Crack & Joint Stitching Detail
Near Blanchard to Jct 200 NB

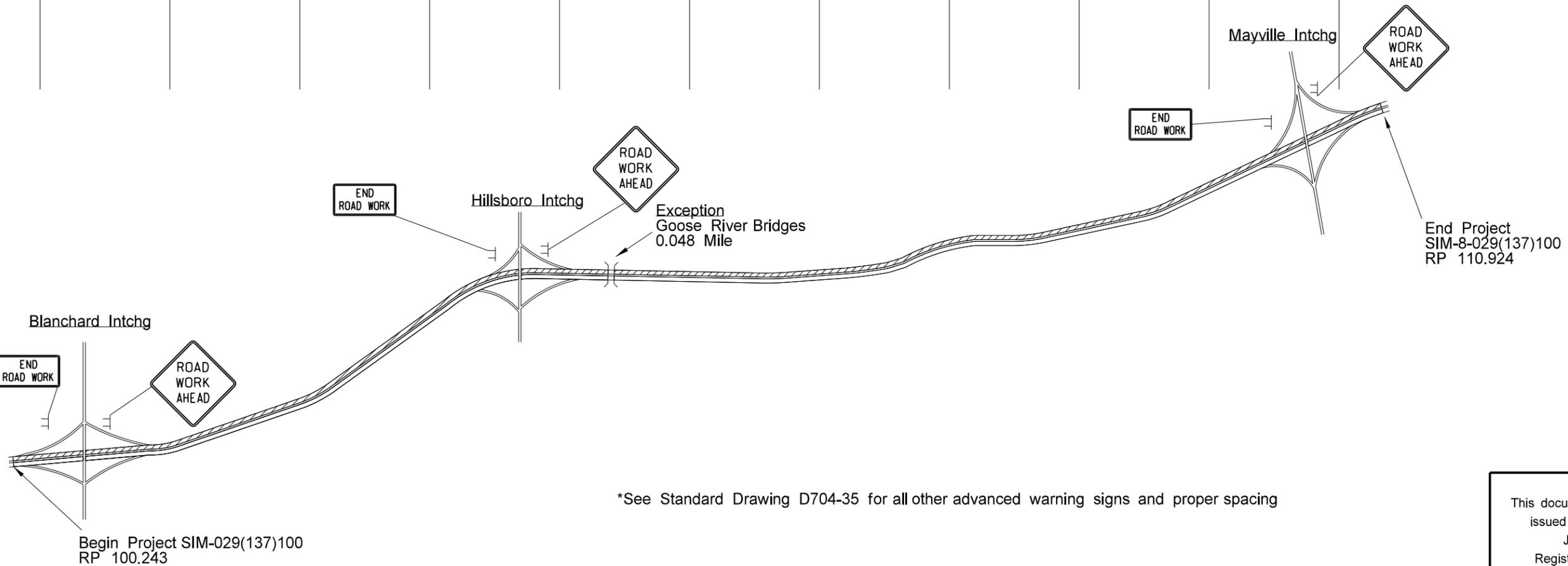
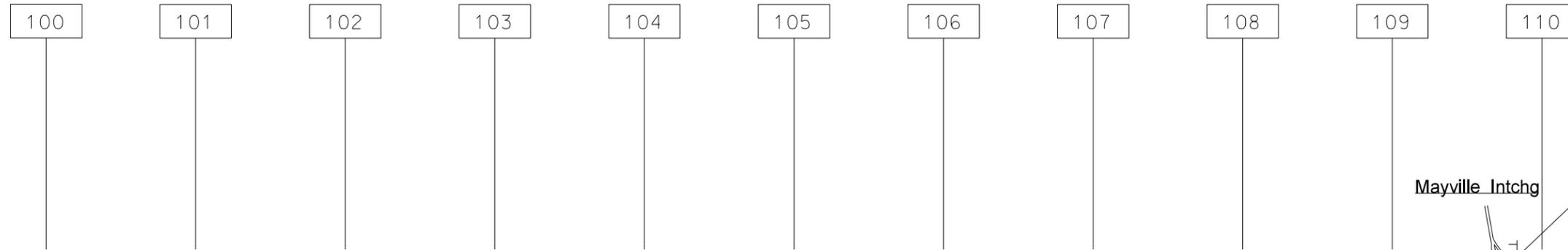
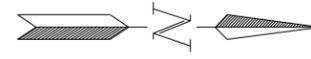
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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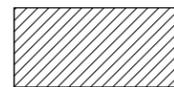
Existing Typical Section
Near Blanchard to Jct 200 SB
RP 110.9240 to RP 100.2430

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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*See Standard Drawing D704-35 for all other advanced warning signs and proper spacing

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 Concrete Pavement Repair

WZTC
Concrete Pavement Repair
Near Blanchard to ND 200 - Southbound

NDDOT ABBREVIATIONS

Abn	abandoned	Calc	calculate	Xsec	cross sections	Eq	equal
Abut	abutment	Cd	candela	Xing	crossing	Eq	equation
Ac	acres	CIP	cast iron pipe	Xrd	Crossroad	Evgr	evergreen
Adj	adjusted	CB	catch basin	Crn	crown	Exc	excavation
Aggr	aggregate	CRS	cationic rapid setting	CF	cubic feet	Exst	existing
Ahd	ahead	C Gd	cattle guard	M3	cubic meter	Exp	expansion
ARV	air release valve	C To C	center to center	M3/s	cubic meters per second	Expy	Expressway
Align	alignment	Cl or C	centerline	CY	cubic yard	E	external of curve
Al	alley	Cm	centimeter	Cy/mi	cubic yards per mile	Extru	extruded
Alt	alternate	Ch	chain	Culv	culvert	FOS	factor of safety
Alum	aluminum	Chnlk	chain-link	C&G	curb & gutter	F	Fahrenheit
ADA	Americans with Disabilities Act	Ch Blk	channel block	CI	curb inlet	FS	far side
A	ampere	Ch Ch	channel change	CR	curb ramp	F	farad
&	and	Chk	check	CS	curve to spiral	Fed	Federal
Appr	approach	Chsld	chiseled	C	cut	FP	feed point
Approx	approximate	Cir	circle	Dd Ld	dead load	Ft	feet/foot
ACP	asbestos cement pipe	Cl	class	Defl	deflection	Fn	fence
Asph	asphalt	Cl	clay	Defm	deformed	Fn P	fence post
AC	asphalt cement	Cl F	clay fill	Deg or D	degree	FO	fiber optic
Assmd	assumed	Cl Hvy	clay heavy	Dint	delineate	FB	field book
@	at	Cl Lm	clay loam	Dintr	delineator	FD	field drive
Atten	attenuation	Clnt	clean-out	Depr	depression	F	fill
ATR	automatic traffic recorder	Clr	clear	Desc	description	FAA	fine aggregate angularity
Ave	Avenue	Cl&gr	clearing & grubbing	Det	detail	FS	fine sand
Avg	average	Co S	coal slack	DWP	detectable warning panel	FH	fire hydrant
ADT	average daily traffic	Comb.	combination	Dtr	detour	FI	flange
Az	azimuth	Coml	commercial	Dia	diameter	FIRD	flared
Bk	back	Compr	compression	Dir	direction	FES	flared end section
BF	back face	CADD	computer aided drafting & design	Dist	distance	F Bcn	flashing beacon
Bs	backsight	Conc	concrete	DM	disturbed material	FA	flight auger sample
Balc	balcony	Cond	conductor	DB	ditch block	FL	flow line
B Wire	barbed wire	Const	construction	DG	ditch grade	Ftg	footing
Barr	barricade	Cont	continuous	Dbl	double	FM	force main
Btry	battery	CSB	continuous split barrel sample	Dn	down	Fs	foresight
Brg	bearing	Contr	contraction	Dwg	drawing	Fnd	found
BI	beehive inlet	Contr	contractor	Dr	drive	Fdn	foundation
Beg	begin	CP	control point	Drwy	driveway	Frac	fractional
BM	bench mark	Coord	coordinate	DI	drop inlet	Frwy	freeway
Bkwy	bikeway	Cor	corner	D	dry density	Frt	front
Bit	bituminous	Corr	corrected	Ea	each	FF	front face
Blk	block	CAES	corrugated aluminum end section	Esmt	easement	F Disp	fuel dispenser
Bd Ft	board feet	CAP	corrugated aluminum pipe	E	East	FFP	fuel filler pipes
BH	bore hole	CMES	corrugated metal end section	EB	Eastbound	FLS	fuel leak sensor
BS	both sides	CMP	corrugated metal pipe	Elast	elastomeric	Furn	furnished
Bot	bottom	CPVCP	corrugated poly-vinyl chloride pipe	EL	electric locker		
Blvd	Boulevard	CSES	corrugated steel end section	E Mtr	electric meter		
Bndry	boundary	CSP	corrugated steel pipe	Elec	electric/al		
BC	brass cap	C	coulomb	EDM	electronic distance meter		
Brkwy	breakaway	Co	County	Elev or El	elevation		
Br	bridge	Crse	course	Ellipt	elliptical		
Bldg	building	C Gr	course gravel	Emb	embankment		
BV	butterfly valve	CS	course sand	Emuls	emulsion/emulsified		
Byb	bypass	Ct	Court	ES	end section		
C Gdrl	cable guardrail	Xarm	cross arm	Engr	engineer		
		Xbuck	cross buck	ESS	environmental sensor station		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11	Added Items
03-15-13	Added Items
11-01-13	Added Items

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NDDOT ABBREVIATIONS

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		
Hr	hour(s)	L Sum	lump sum	OC	organic content		
Hyd	hydrant	Lx	lux	Orig	original		
Ph	hydrogen ion content	ML	main line	O To O	out to out		
Id	identification	M Hr	man hour	OD	outside diameter		
In or "	inch	MH	manhole	OH	overhead		
Incl	inclinometer tube	Mkd	marked	PMT	pad mounted transformer		
IMH	inlet manhole	Mkr	marker	Pg	pages		
ID	inside diameter	Mkg	marking	Pntd	painted		
Inst	instrument	MA	mast arm	Pr	pair		
Intchg	interchange	Matl	material	Pnl	panel		
Intmdt	intermediate	Max	maximum	Pk	park		
Intscn	intersection	MC	meander corner	PK	Parker-Kalon nail		
Inv	invert	Meas	measure	Pa	pascal		
IM	iron monument	Mdn	median	PSD	passing sight distance		
IPn	Iron Pin	MD	median drain	Pvmt	pavement		
IP	iron Pipe	MC	medium curing	Ped	pedestal		
Jt	joint	M	mega	Ped	pedestrian		
		Mer	meridian	PPP	pedestrian pushbutton post		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11	Added Items
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11-01-13	Added Items

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NDDOT ABBREVIATIONS

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
06-15-10	
REVISIONS	
DATE	CHANGE
04-20-11	Added Items
03-15-13	Added Items
11-01-13	Added Items

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

702COM 702 Communications
 ACCENT Accent Communications
 AGASSIZ WU Agassiz Water Users Incorporated
 AGC Associated General Contractors of America
 All 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-trail 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
 MCKENZ 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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
6-15-10	
REVISIONS	
DATE	CHANGE
04-20-11	Added Items
03-15-13	Added Items
11-01-13	Added Items, Changed Standard Name to Include Organizations

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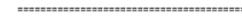
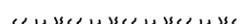
Line Styles

.....	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	.....

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

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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)		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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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

D-20-31

 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	 Existing Monument Found	 Existing Pull Box	 Existing Gas Pipe Vent
 Existing Overhead Sign Structure Load Center	 Existing Monument set	 Existing Intelligent Transportation Pull Box	 Existing Sanitary Pipe Vent
 Existing Luminaire	 Existing RW Property Monument Found	 Existing Water Pump	 Existing Storm Drain Pipe Vent
 Existing Light Standard Luminaire	 Existing RW Property Monument set	 Existing Slotted Reinforced Concrete Pipe	 Existing Water Pipe Vent
 Existing Federal Mailbox	 Existing Object Marker Type I	 Existing RR Profile Spot	 Existing Weather Station
 Existing Private Mailbox	 Existing Object Marker Type II	 Existing Fuel Leak Sensors	 Existing Ground Water Well Bore Hole
 Existing Meander Section Corner	 Existing Object Marker Type III	 Existing Highway Sign	 Existing Windmill or Tower
 Existing Meter	 Existing Electrical Pedestal	 Existing Miscellaneous Spot	 Existing Witness Corner
 Existing Electrical Manhole	 Existing Telephone Pedestal	 Existing Lighting Standard Pole	 Flashing Beacon
 Existing Gas Manhole	 Existing Fiber Optic Telephone Pedestal	 Existing Traffic Signal Standard	 Flagger
 Existing Sanitary Manhole	 Existing TV Pedestal	 Existing Transformer	 Pipe Mounted Flasher
 Existing Sanitary Force Main Manhole	 Existing Fiber Optic TV Pedestal	 Existing Large Evergreen Tree	 Sanitary Force Main with Valve
 Existing Sanitary Manhole with Valve	 Existing Fuel Filler Pipes	 Existing Small Evergreen Tree	
 Existing Storm Drain Manhole	 Existing Traverse PI Aerial Panel	 Existing Large Tree	
 Existing Force Main Storm Drain Manhole	 Existing Pole	 Existing Small Tree	
 Existing Force Main Storm Drain Manhole with Valve	 Existing Power Pole	 Existing Tree Trunk	
 Existing Telephone Manhole	 Existing Power Pole with Transformer	 Existing Pad Mounted Traffic Signal Control Box	

NORTH DAKOTA	
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Symbols

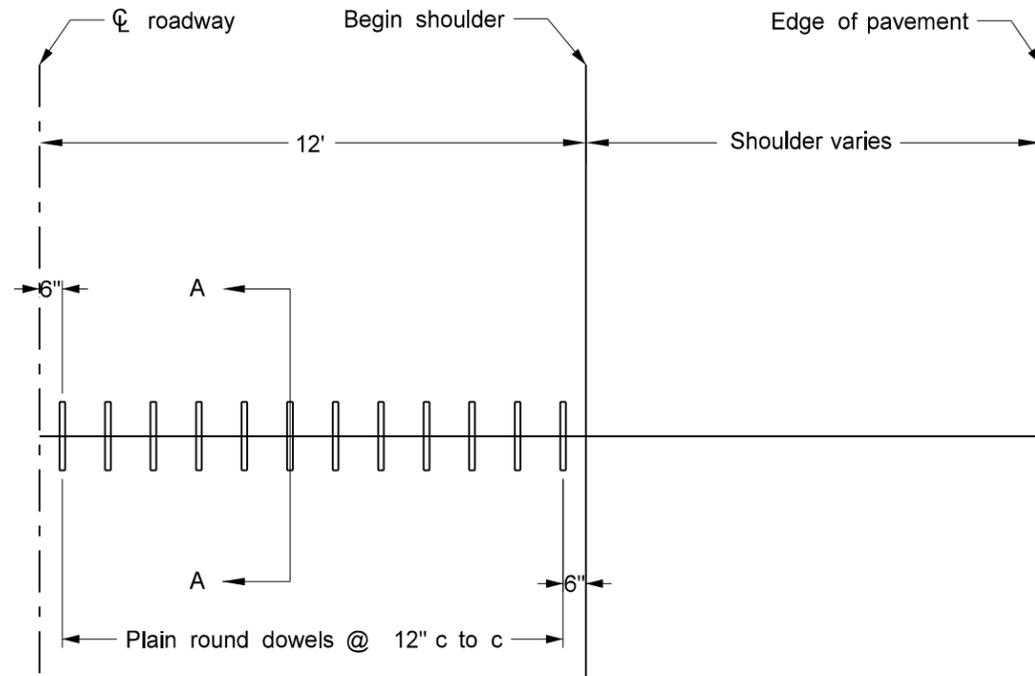
D-20-32

 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 Grate 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  Concrete Monument to Be Set  RW Property Monument to Be Set	 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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NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
4-20-11	
REVISIONS	
DATE	CHANGE

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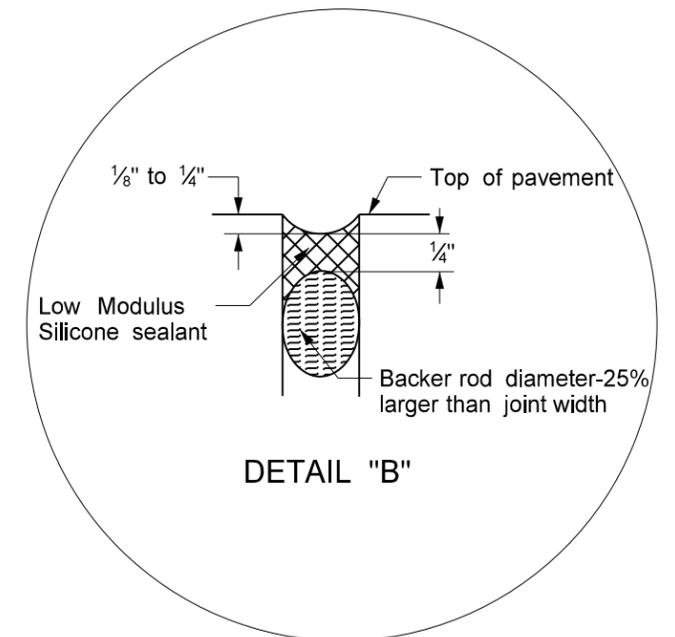
TRANSVERSE CONTRACTION JOINT DETAILS



CONTRACTION JOINT DOWEL ASSEMBLY
(1/2 roadway shown)

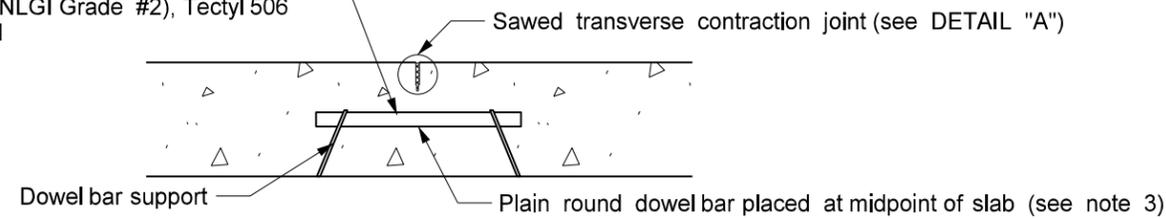
Notes

1. The joint seal details apply to both doweled and non-doweled (plain) transverse joints.
2. T = Thickness of pavement.
3. Dowels
 Pavement 10" or less: 1 1/4" X 18" plain round
 Pavement greater than 10": 1 1/2" X 18" plain round
4. B = T/4 + 1/4" for AE or YE non-doweled concrete pavement
 or T/3 for high early or doweled concrete pavement

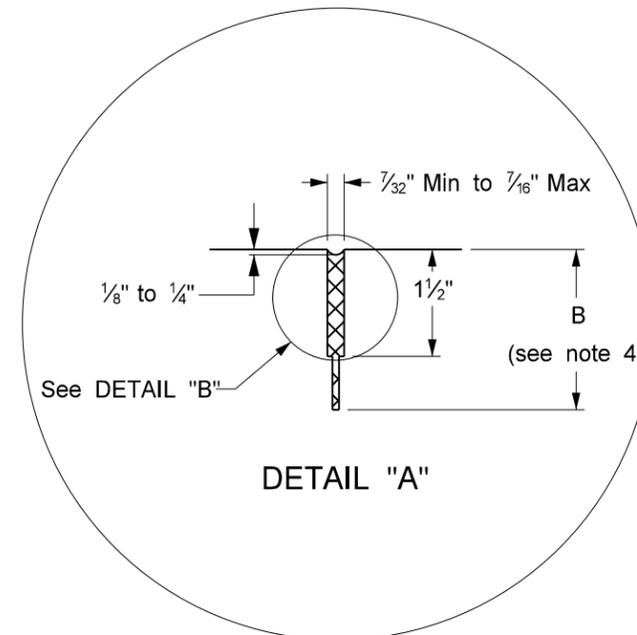


DETAIL "B"

Coat entire dowel bar length with Multipurpose Lithium Grease (NLGI Grade #2), Tectyl 506 or approved equal



SECTION A-A

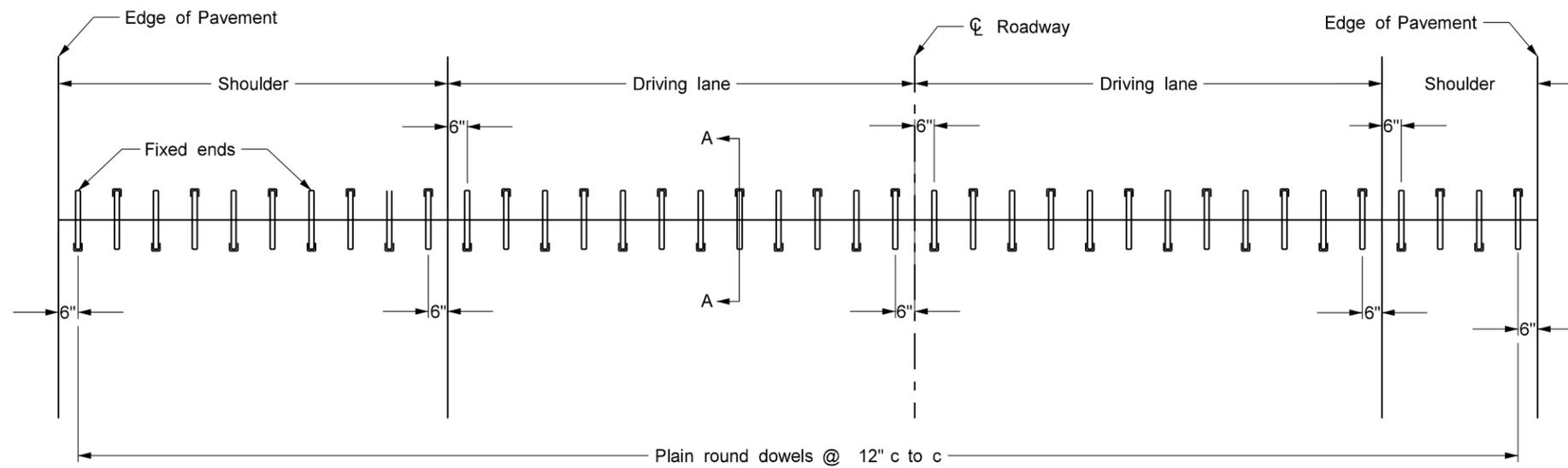


DETAIL "A"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE

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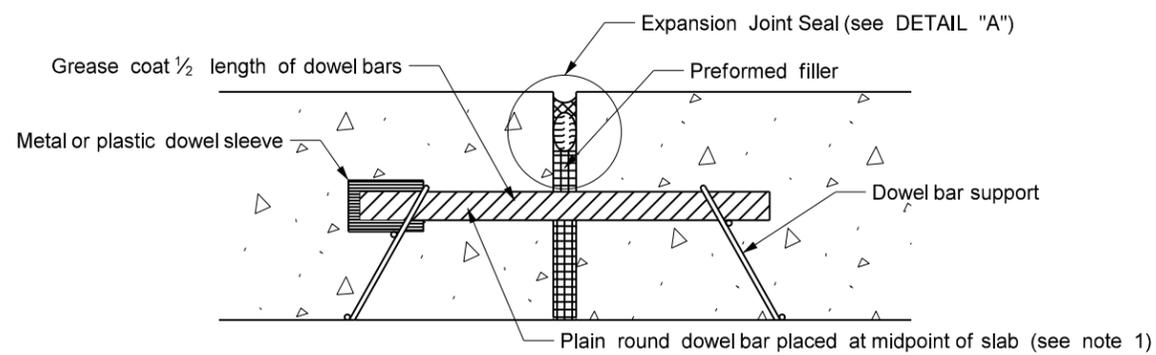
TRANSVERSE EXPANSION JOINT DETAIL



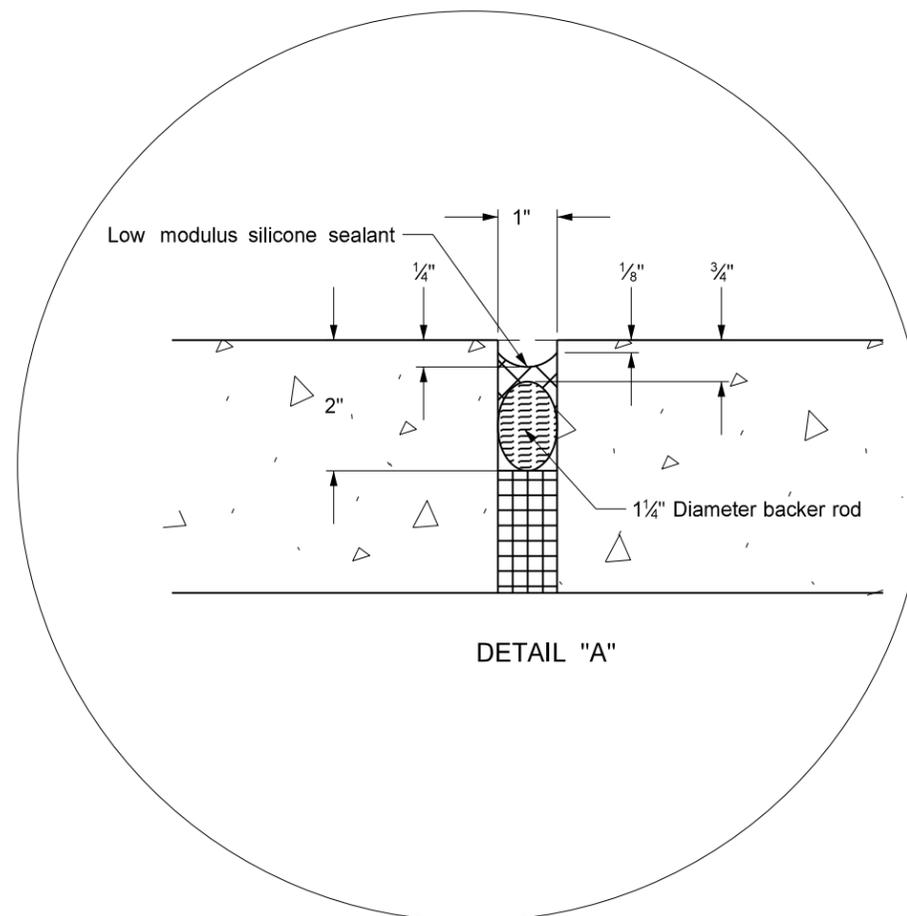
Notes

- 1. Dowels
 - Pavement thickness 10" or less: 1 1/4" X 18" plain round
 - Pavement thickness greater than 10": 1 1/2" X 18" plain round

DOWELED EXPANSION JOINT ASSEMBLY



SECTION A-A



DETAIL "A"

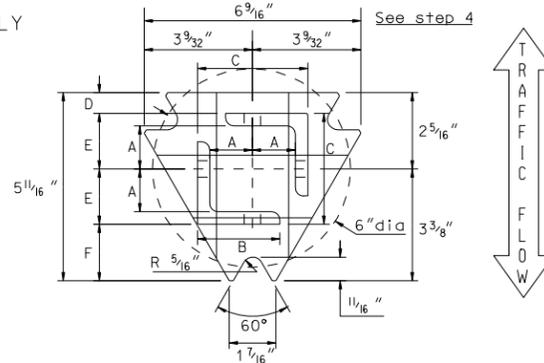
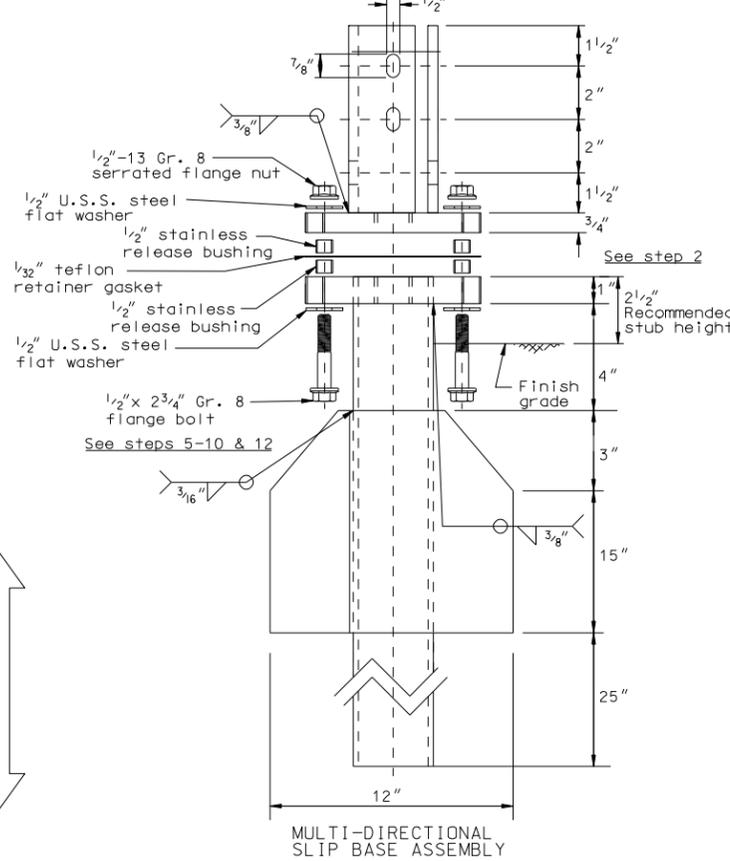
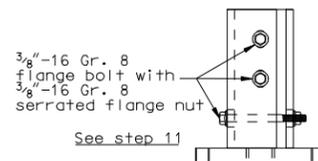
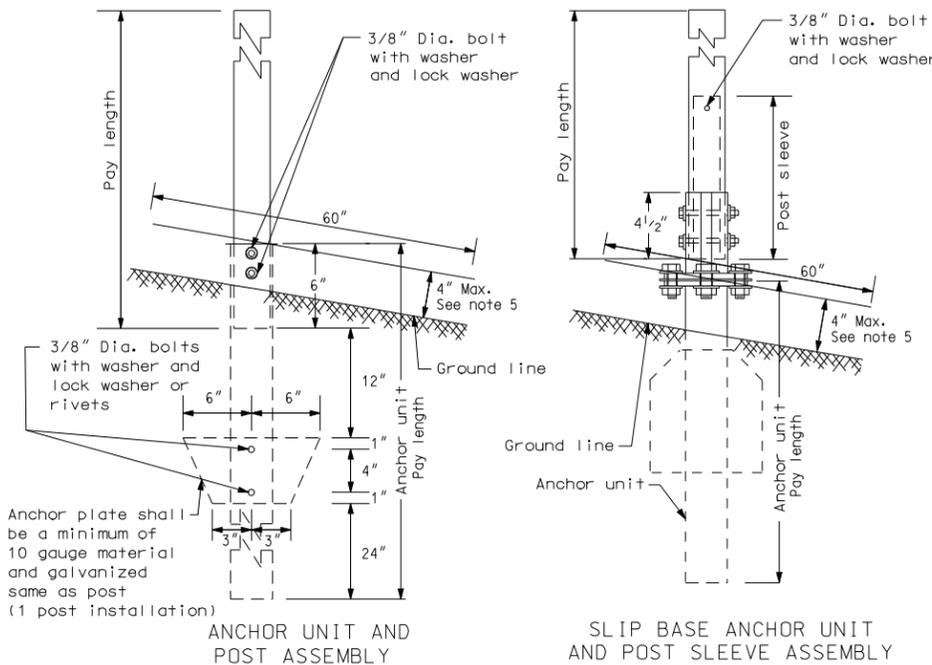
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE

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BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

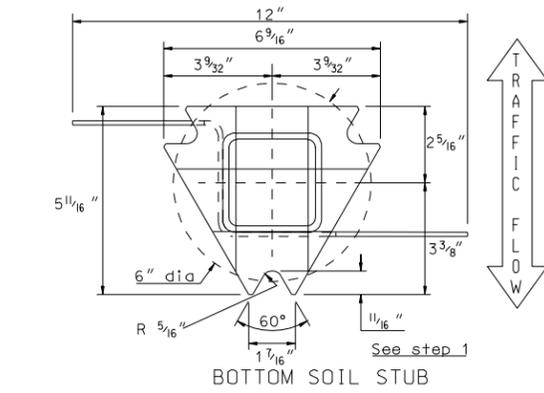
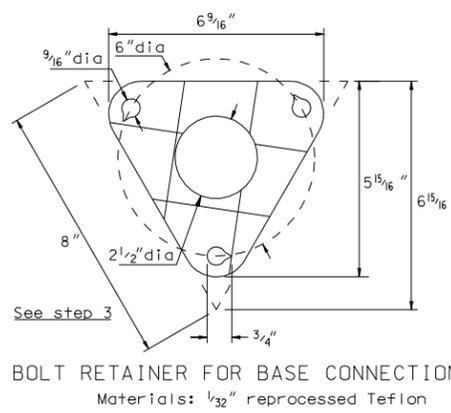
PERFORATED TUBE



TOP POST RECEIVER DATA TABLE

Square Post Sizes	A	B	C	D	E	F
2 3/16" x 10 Ga. Square Post	1 3/64"	2 1/2"	3 1/32"	2 5/32"	1 3/64"	1 7/8"
2 1/2" x 10 Ga. Square Post	1 3/32"	2 1/2"	3 5/16"	5/8"	1 2/32"	1 3/4"

2 3/16" x 10 gauge may be inserted into 2 1/2" x 10 gauge for additional wind load.



- Notes
- Slip base bolts shall be torqued as specified by the manufacturer.
 - The 2 3/16" size 10 gauge is shown as 2.19" size on the plans. The 2 1/2" size 10 gauge is shown as 2.51" size on the plans.
 - Anchor for 2", 2 1/4", and 2 1/2" posts.
 - Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3" x 3" x 7 gauge ASTM A500 Grade B. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/A153. All tolerances on anchor unit and slip base bottom assembly are ± 0.005 unless otherwise noted.
 - 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
 - When used in concrete sidewalk, anchor shall be the same except without the wings.
 - Four post signs shall have over 8' between the first and fourth posts.

Telescoping Perforated Tube

Number of Posts	Telescoping Perforated Tube					
	Post Size In.	Wall Thickness Gauge	Sleeve Size In.	Wall Thickness Gauge	Slip Base	Anchor Size Without Slip Base In.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			B	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	10			Yes	
2	2 1/4	12	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	

B - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

MULTI-DIRECTIONAL SLIP BASE ASSEMBLY

STEP	INSTALLATION PROCEDURE
1.	Install bottom soil anchor stub plumb and squared up with road, with point of plate facing oncoming traffic.
2.	Depth of imbedment to leave 2 1/2" from grade to top of anchor plate.
3.	Place teflon bolt retainer gasket on top of bottom plate (make sure that notches in holes are pointing counter clockwise).
4.	Place top post receiver on to retainer gasket, properly indexed so that angle receivers are squared up with road.
5.	Slide 1 each 1/2" flat washer on to 1 each inverted 1/2"-13 gr. 8 flange bolt, followed by 1 each stainless steel release bushing.
6.	Insert above bolt with washer and bushing up through notched points of top and bottom plates, passing through hole in gasket.
7.	Slide second bushing down on to above bolt until it rests on top of gasket followed by second washer.
8.	Complete by threading 1/2"-13 gr. 8 serrated flange nut snugly down against top of washer.
9.	Repeat steps 5,6,7 & 8 at the two remaining notched triangle points.
10.	Insert sign post into angle receivers on top half until post(s) bottom out. *NOTE: Where higher wind load is desired, insert the next size smaller square post inside bottom of main upright post (Minimum of 48", not to exceed beyond bottom edge of sign).
11.	Secure posts into receivers using 3 each 3/8"-16 gr. 8 flange bolts and 3 each 3/8"-16 serrated flange nuts in receiver slots (top 2 bolts should be parallel to highway) do not tighten nuts until all bolts are in place.
12.	After all sub-assembly hardware is tightened, then torque the three 1/2"-13 nuts to 42 ft-lbs, in a circular pattern until all bolt assemblies reach the required torque. *NOTE: On multi-leg installations, be sure that all anchors are squared and lined up with each other.

Telescoping Perforated Tubes

Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In. 4	Cross Sect. Area In. 2	Section Modulus In. 3
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785
4 x 4	0.250	1/4	6.600	3.040	1.940	1.050

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
 11-21-02
REVISIONS

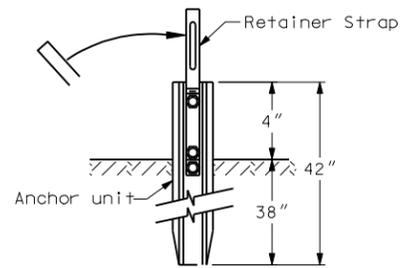
DATE	CHANGE
12-01-04	PE stamp added

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BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

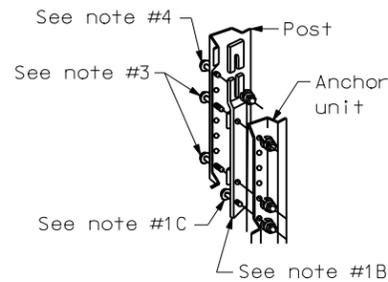
FLANGED CHANNEL



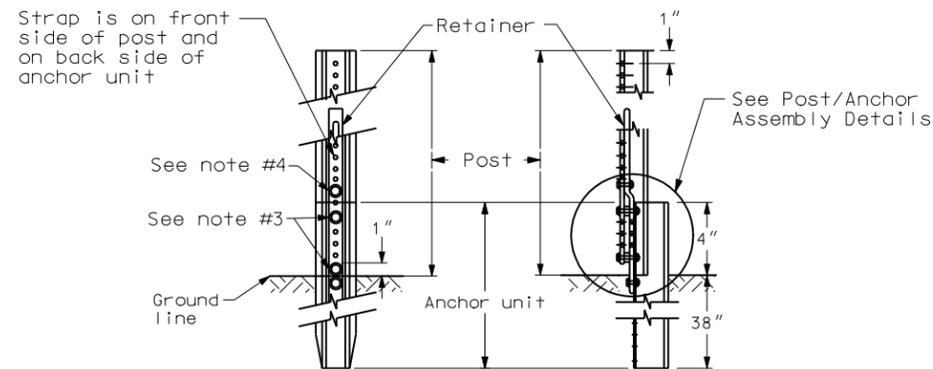
Anchor Unit & Strap Assembly Detail

STEPS OF INSTALLATION

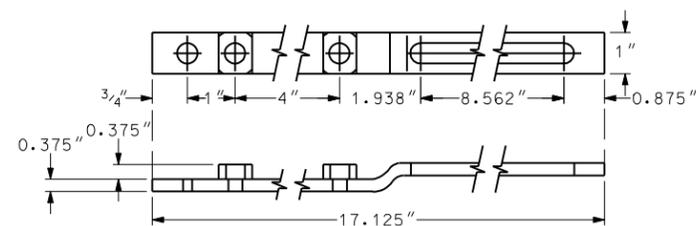
1. A) Drive anchor unit to within 12" of ground level.
B) Proper assembly established by lining up the top 3/4" slot of retainer spacer strap with top hole of anchor unit.
C) Assemble strap to back of anchor unit using 3/8"-16 UNC x 2.0" long bolt, lock washer and nut.
D) Rotate strap 90° to left.
2. A) Drive anchor unit to 4" dimension.
B) Rotate strap to vertical position.
3. A) Place 3/8"-16 UNC x 2" bolt, lock washer & nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit (this coincides with the bottom 3/4" slot in the strap).
B) Alternately tighten two connector bolts.
4. A) Complete assembly by tightening 3/8"-16 UNC x 2" long retainer bolt (this fastens sign post to retainer spacer strap).
5. The base post, strap & 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.



Post/Anchor Assembly Details



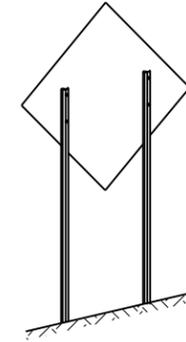
Front View Side View Sign Post Assembly Detail



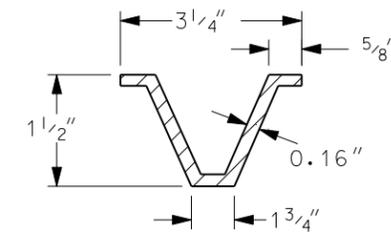
Retainer/Spacer Strap Detail

CHANNEL SIZE IN.	WALL THICKNESS IN.	WEIGHT PER FOOT LBS.	MOMENT OF INERTIA IN. 4	CROSS SECT. AREA IN. SQ.	SECTION MODULUS IN. 3
1.516 x 3.125"	.116	2.00	.179	.590	.225
1.532 x 3.125"	.124	2.25	.201	.648	.254
1.562 x 3.125"	.132	2.50	.233	.748	.289
1.578 x 3.125"	.140	2.75	.271	.819	.329
1.750 x 3.500"	.150	3.00	.372	.918	.403
1.750 x 3.500"	.175	4.00	.500	1.190	.560

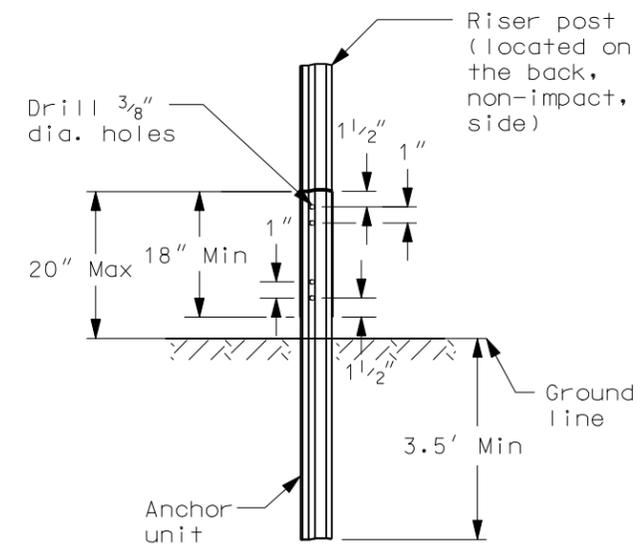
3 LB/FT U POSTS



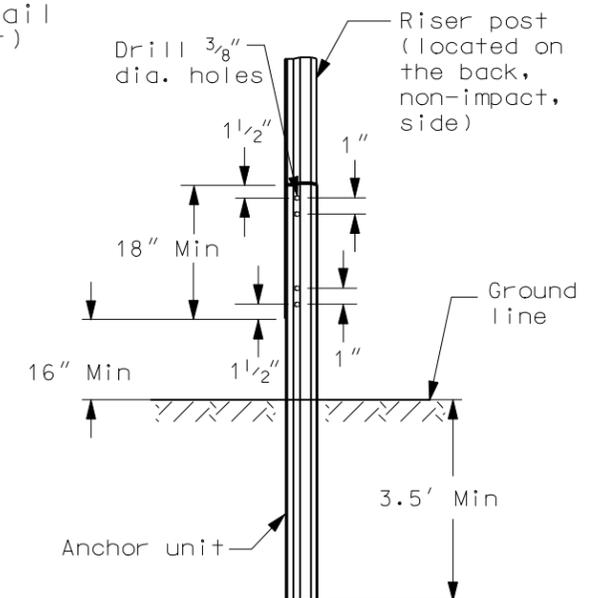
Typical Installation



U-Post Detail (3 lb/ft)



U-Channel Splice Option 1



U-Channel Splice Option 2

Notes

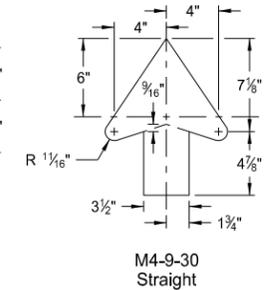
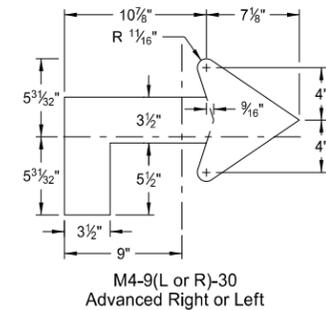
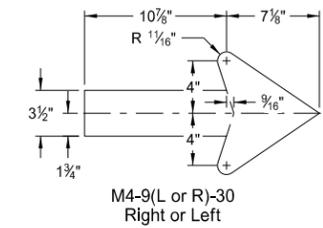
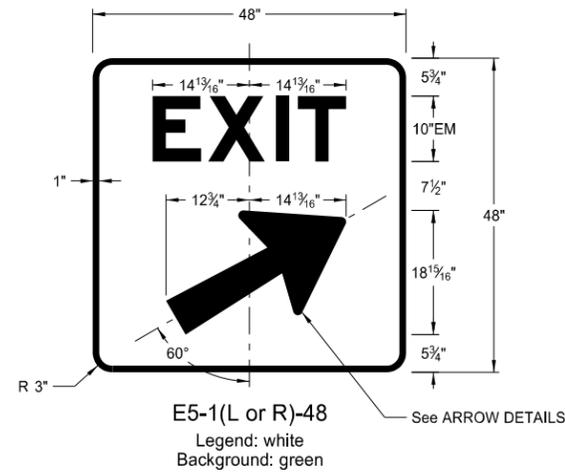
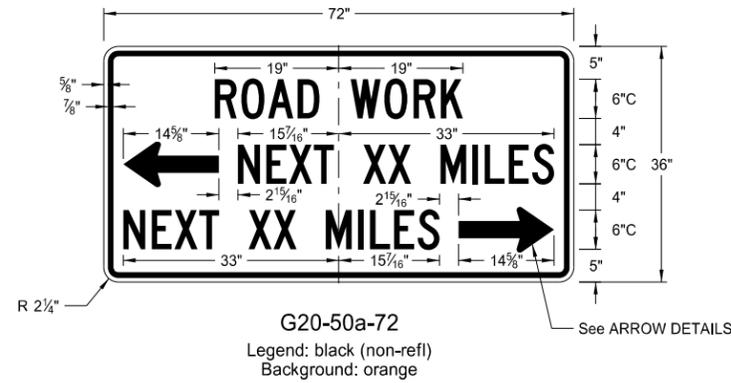
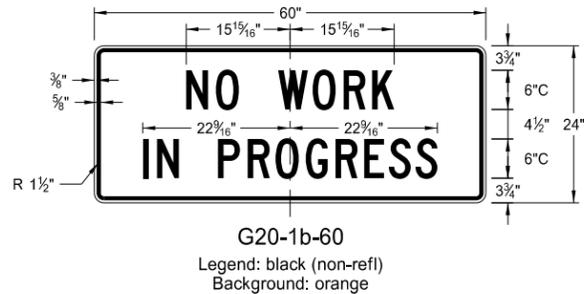
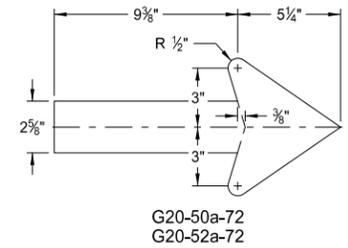
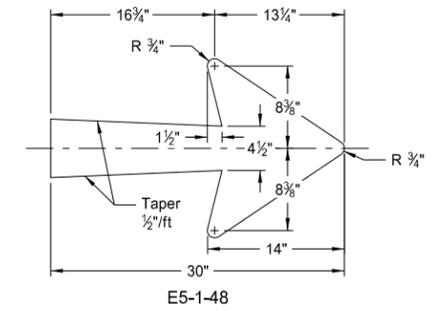
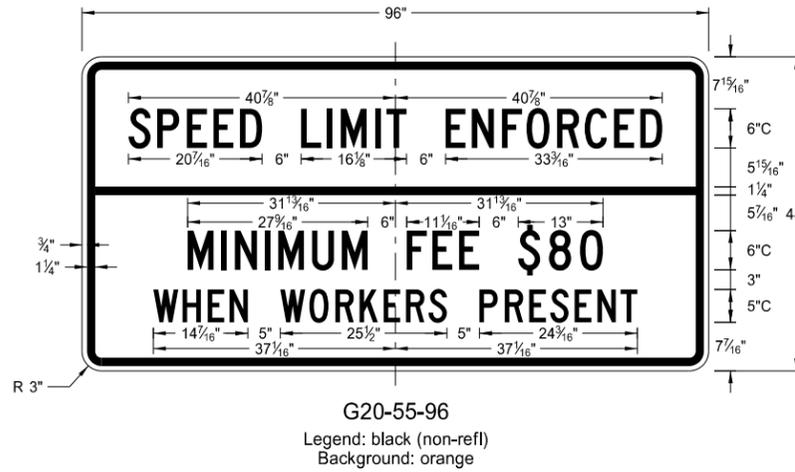
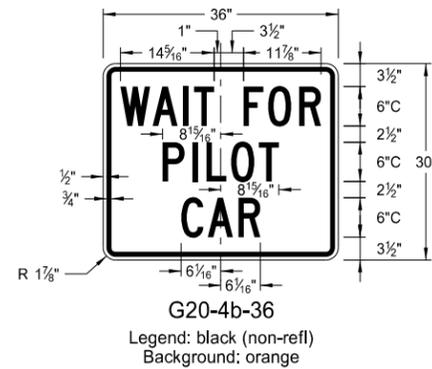
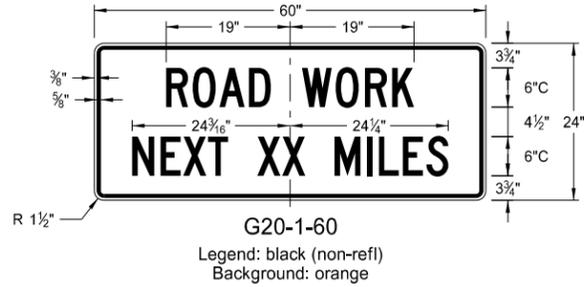
1. Use 3 lb/ft riser anchor units and risers
2. Driven riser posts shall be at least 7' long and embedded at least 3.5'.
3. A splice shall overlap a minimum of 18".
4. Use 4 bolts 5/16" diameter with washers and nuts. Two at top and two at bottom of splice.
5. Anchor unit for guy wires shall be no more than 4" above ground and embedded at least 3.5'.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-28-93	
REVISIONS	
DATE	CHANGE
03-07-01	Revised U-post details
11-21-02	Deleted perforated tube
05-08-03	Revised U-Channel splice
12-01-04	PE stamp added
06-29-05	Revised flanged channel note

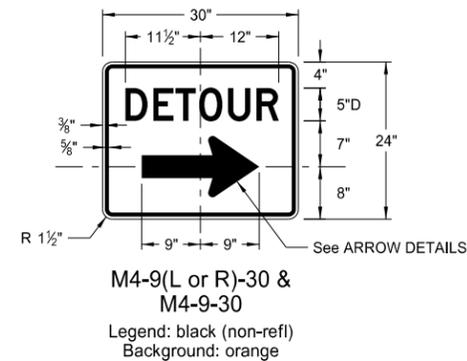
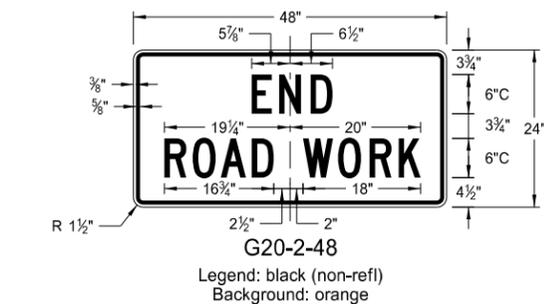
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CONSTRUCTION SIGN DETAILS
 TERMINAL AND GUIDE SIGNS

D-704-9



ARROW DETAILS



NOTES:

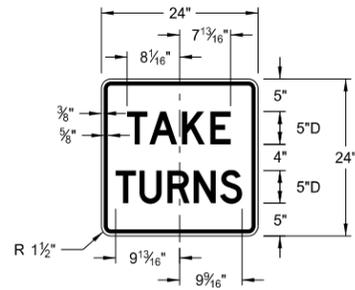
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

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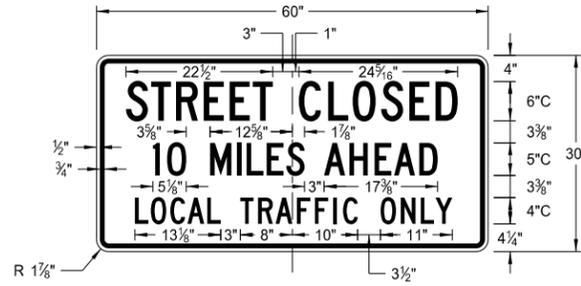
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS

D-704-10



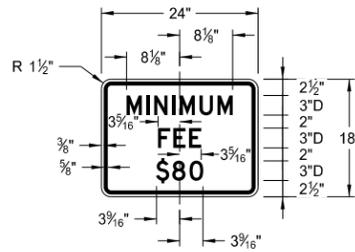
R1-50-24

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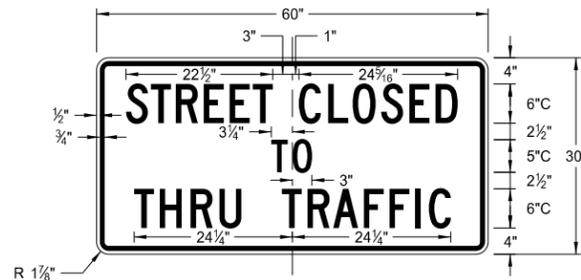
R11-3c-60

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R2-1a-24

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R11-4a-60

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R11-2a-48

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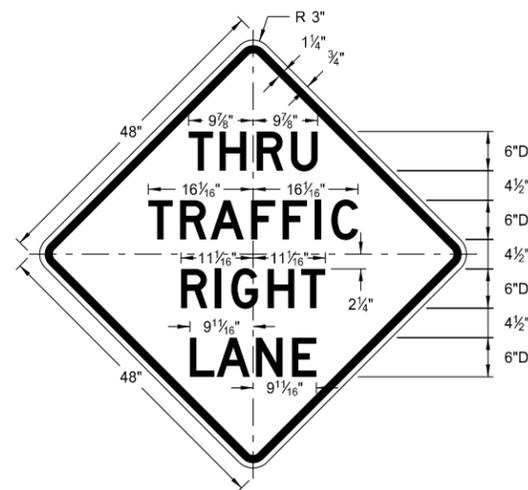
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8-13-13	
REVISIONS	
DATE	CHANGE

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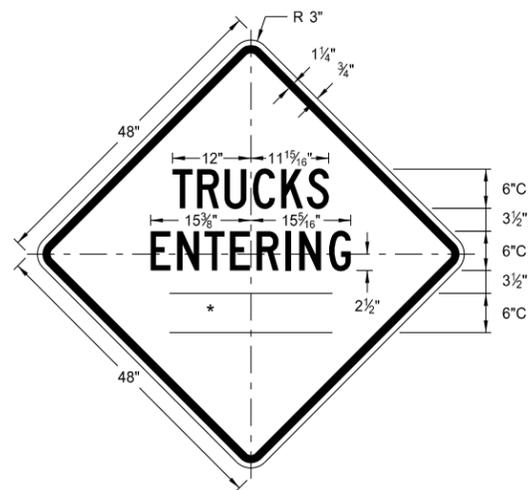
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

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

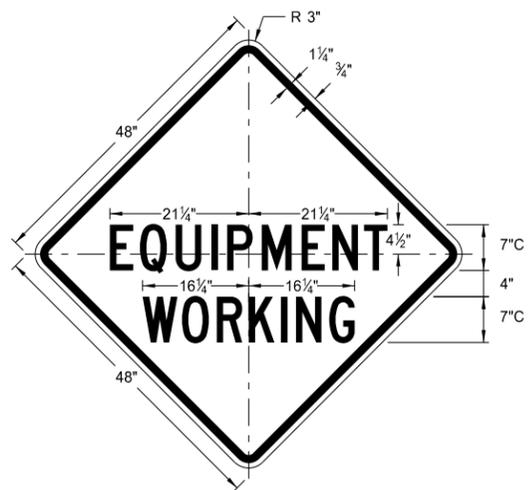
* DISTANCE MESSAGES



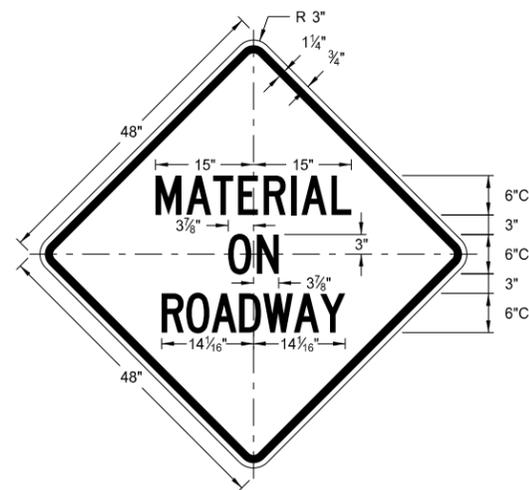
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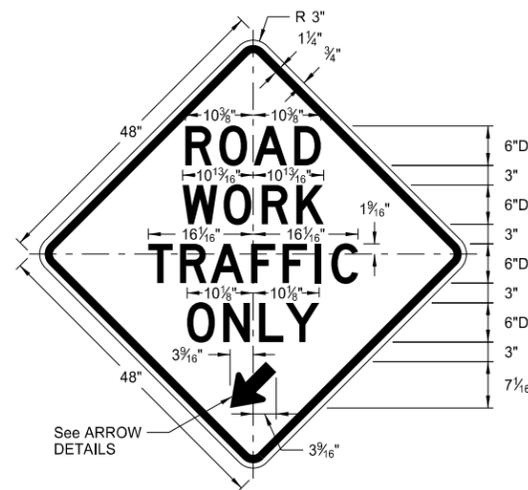
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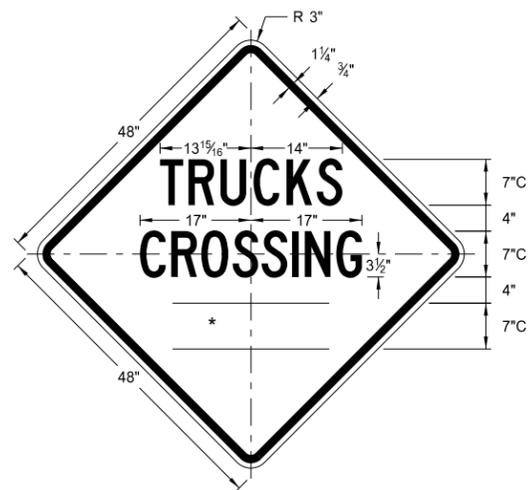
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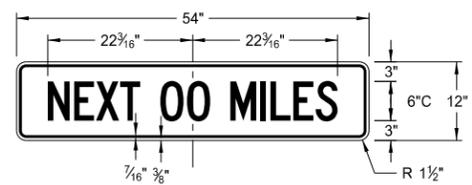
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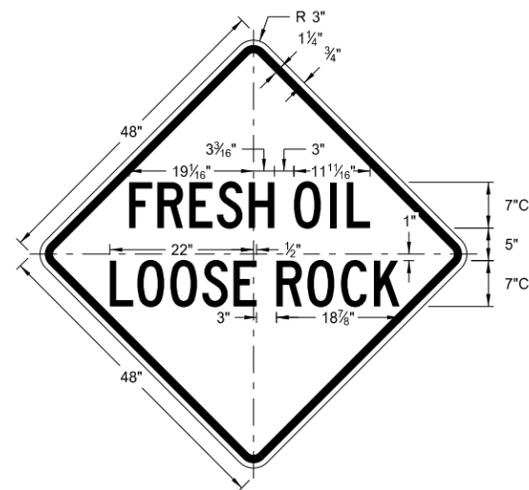
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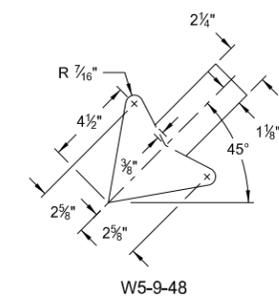
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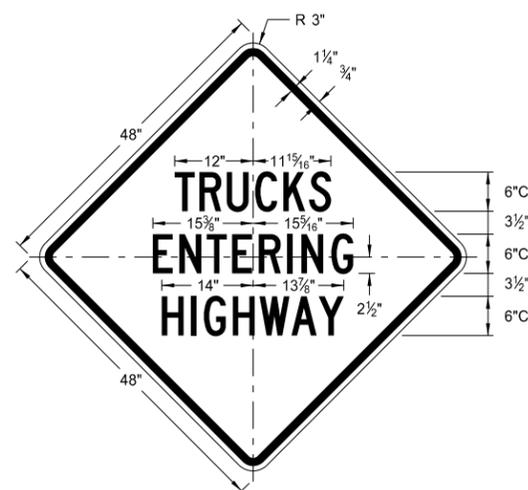
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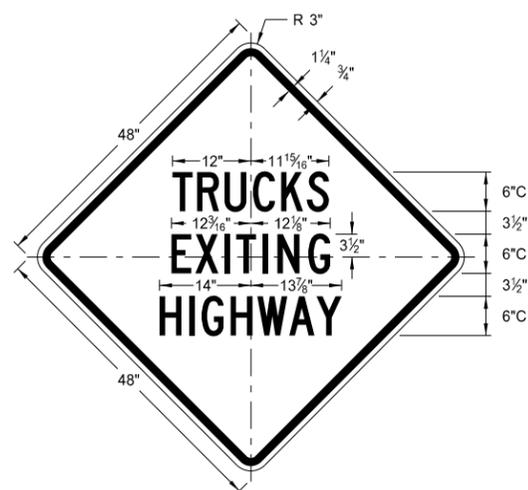
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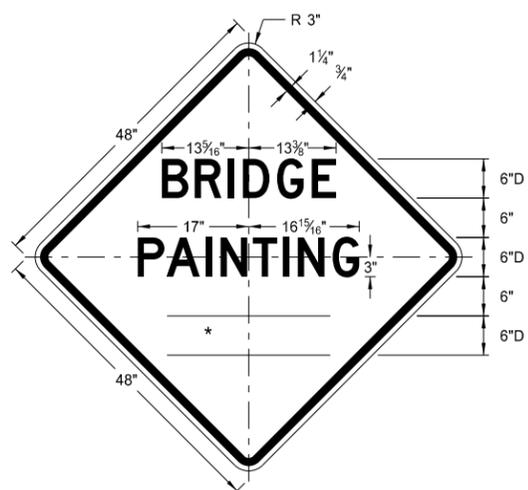
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ARROW DETAILS



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W8-56-48
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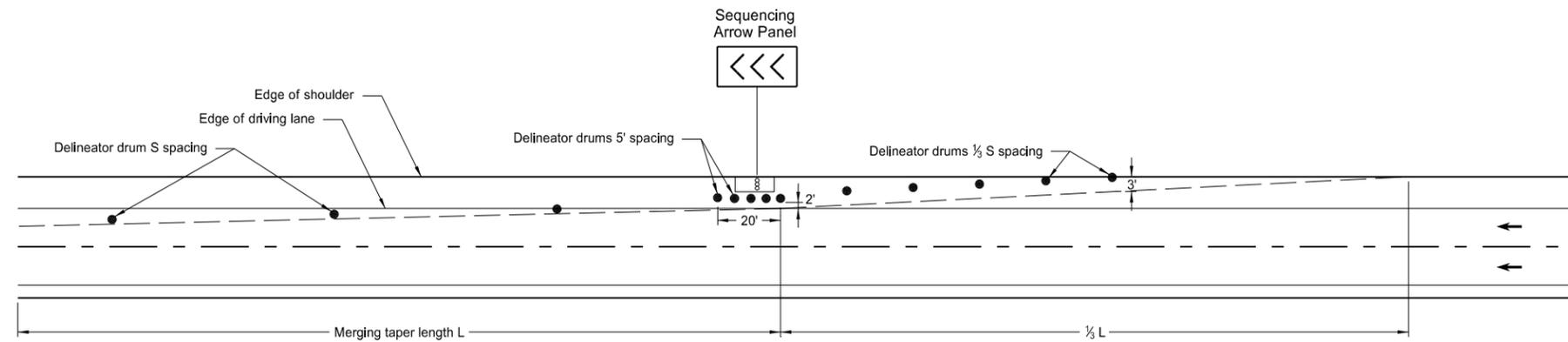
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NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE

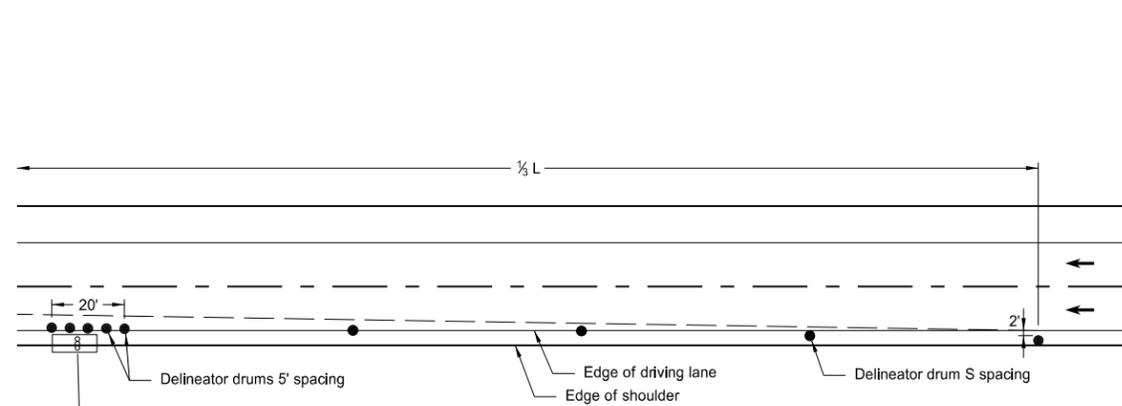
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SHOULDER CLOSURE TAPERS

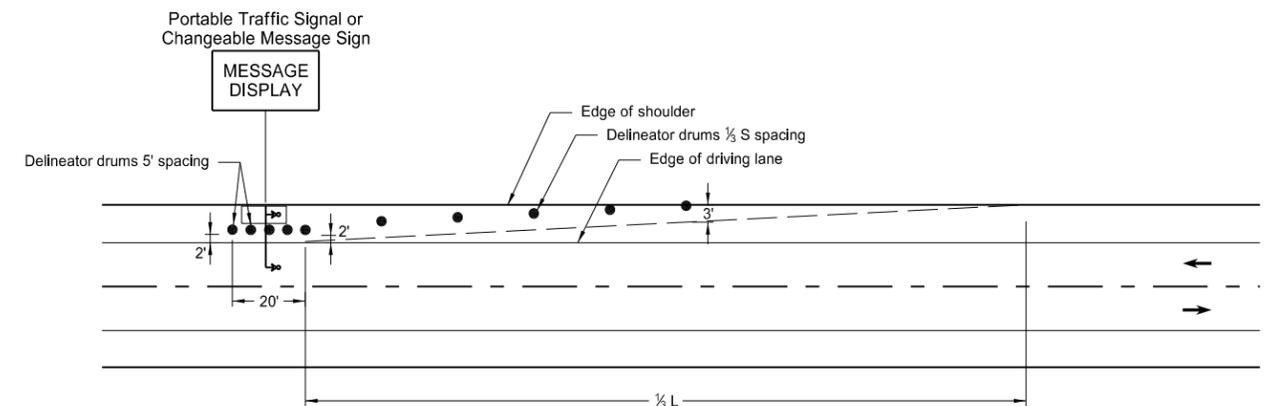
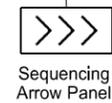
D-704-12



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



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



PORTABLE TRAFFIC SIGNAL OR CHANGEABLE MESSAGE SIGN ON SHOULDER

KEY	
● Delineator Drum	∞ Sequencing Arrow Panel
• Message Display	↳ Portable Traffic Signal

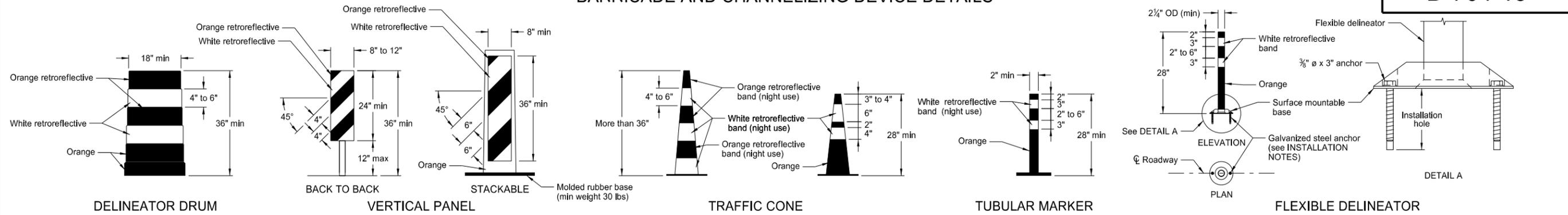
Notes:

- S = Posted Speed Limit in mph
W = Width of offset in feet
L = Taper length in feet
L = $WS^2/60$ (40mph or less)
L = WS (45mph or more)
- If a shoulder taper is used, it should have a length of approximately $1/3L$. If a shoulder is used as a travel lane, a normal merging or shifting taper should be used.
- When paved shoulders of 8 foot width or more are closed, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the work space and direct vehicular traffic to remain within the traveled way.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
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DATE	CHANGE

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BARRICADE AND CHANNELIZING DEVICE DETAILS



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.

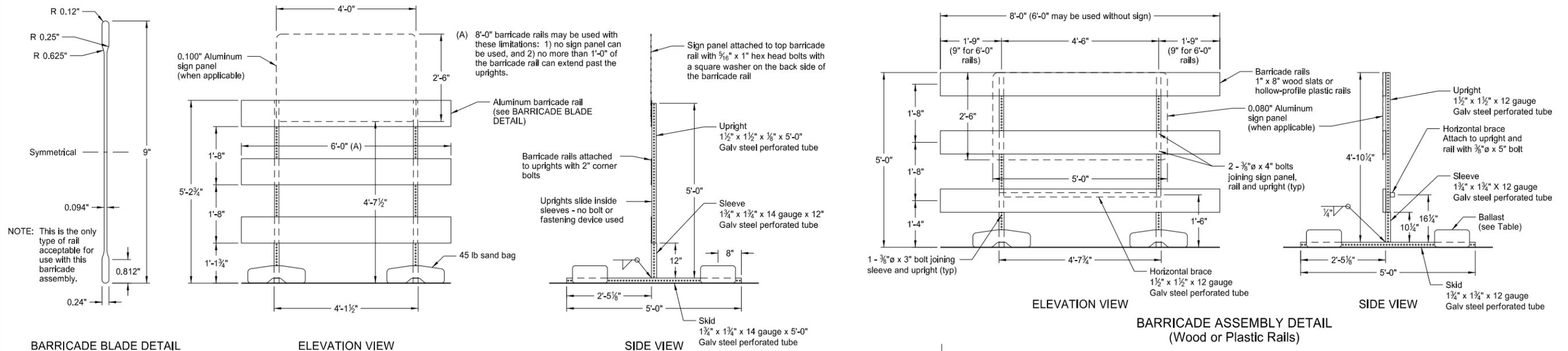
Markings for vertical panels shall be alternating orange and white retroreflective stripes, sloping downward in the direction vehicular traffic is to pass. Retroreflective sheeting shall be placed on both sides of panel and shall have a minimum of 270 square inches of retroreflective area facing vehicular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

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.



BARRICADE BLADE DETAIL

ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

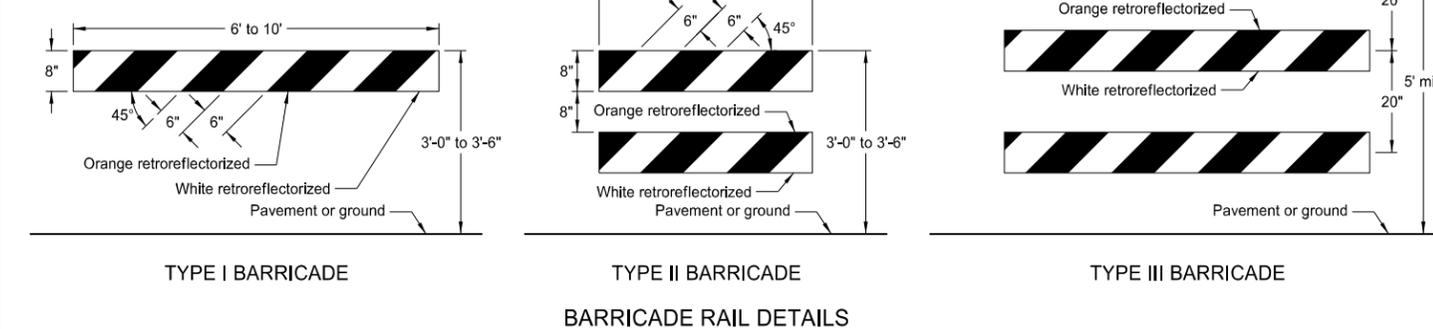
SIDE VIEW

ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

SIDE VIEW

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".



TYPE I BARRICADE

TYPE II BARRICADE

BARRICADE RAIL DETAILS

TYPE III BARRICADE

MINIMUM BALLAST (For each side of barricade support)

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

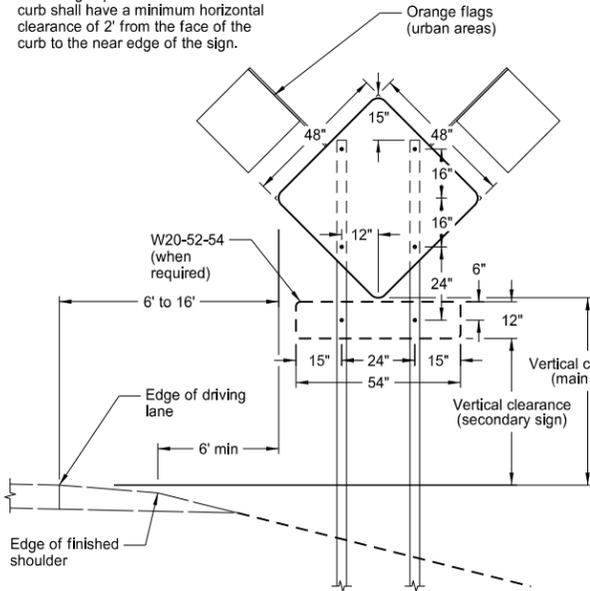
Note: The number of sandbags are based on a wind speed of 55 MPH. The sandbags are assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE

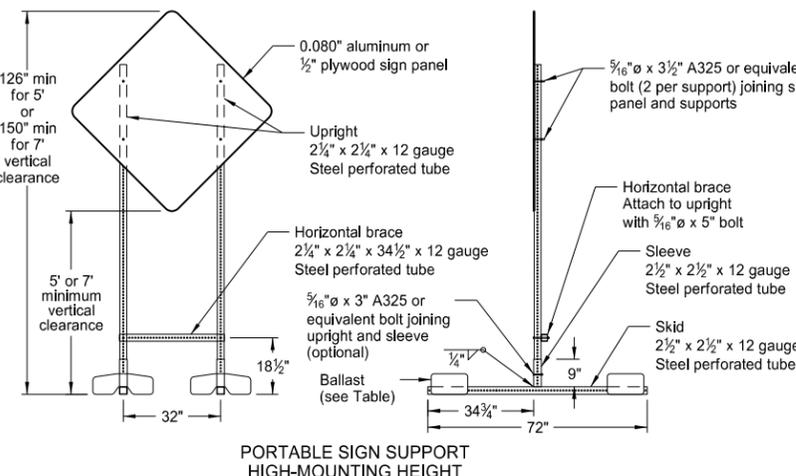
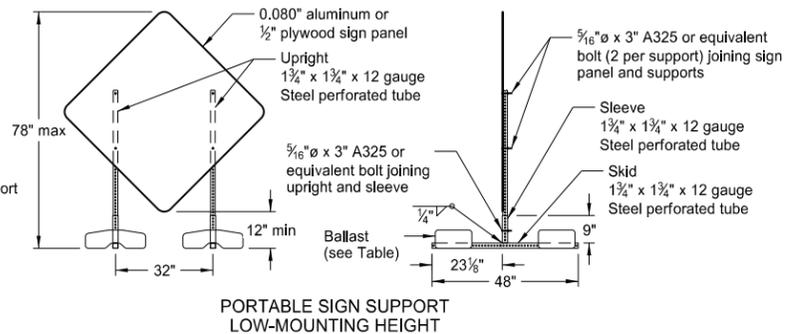
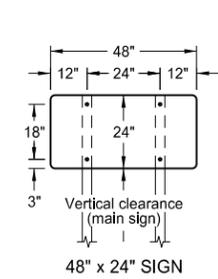
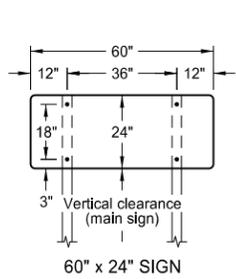
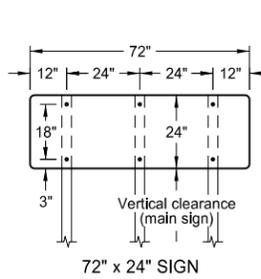
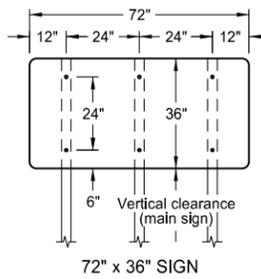
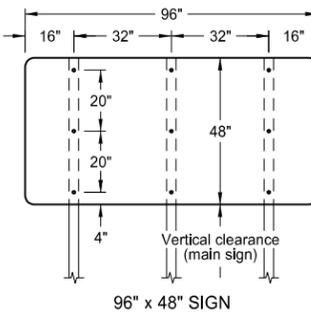
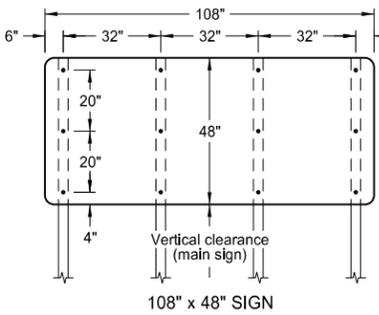
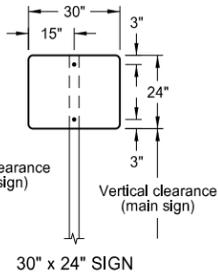
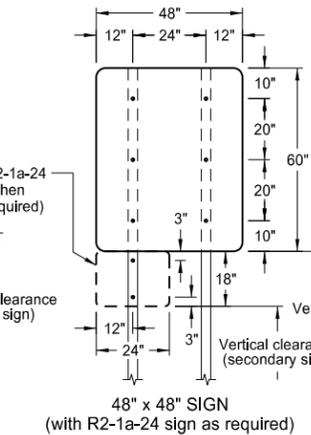
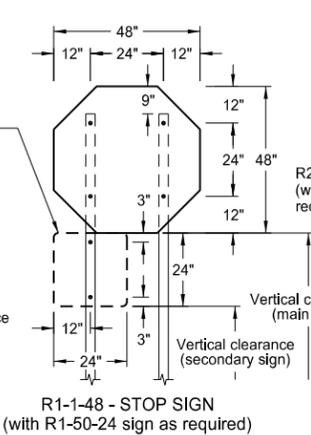
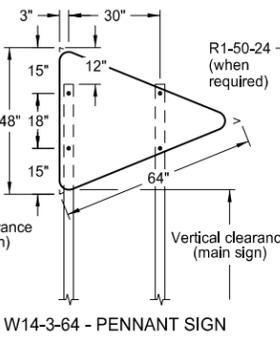
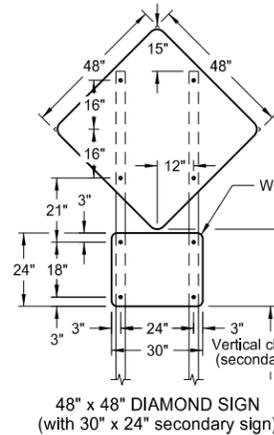
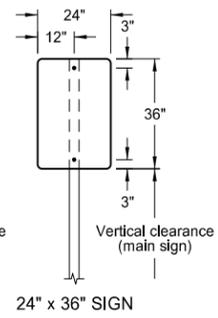
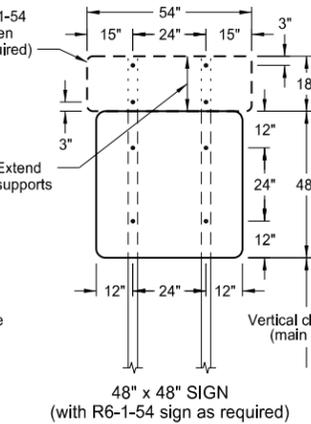
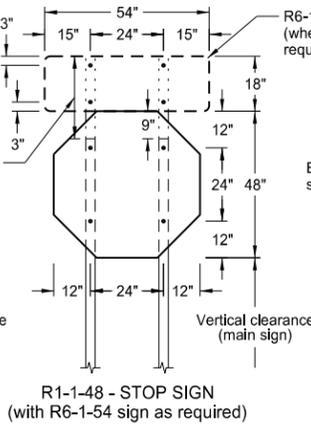
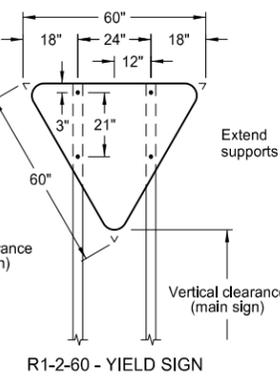
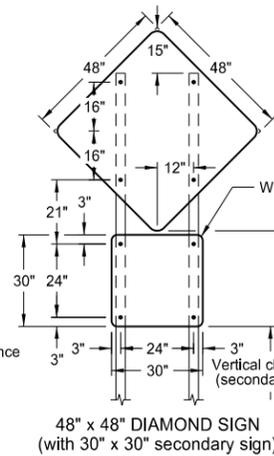
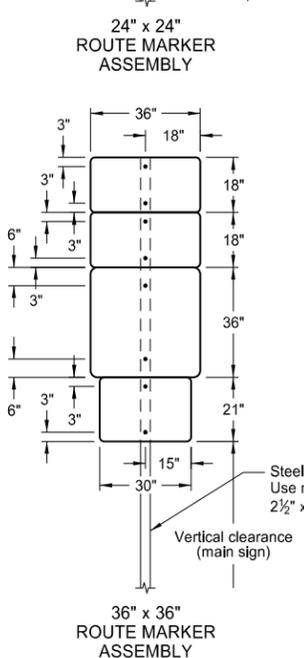
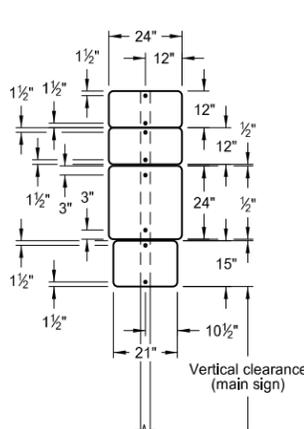
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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

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)



- NOTES:
- 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.

- 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.

- 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)

- 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

- 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.

- 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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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 x 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 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

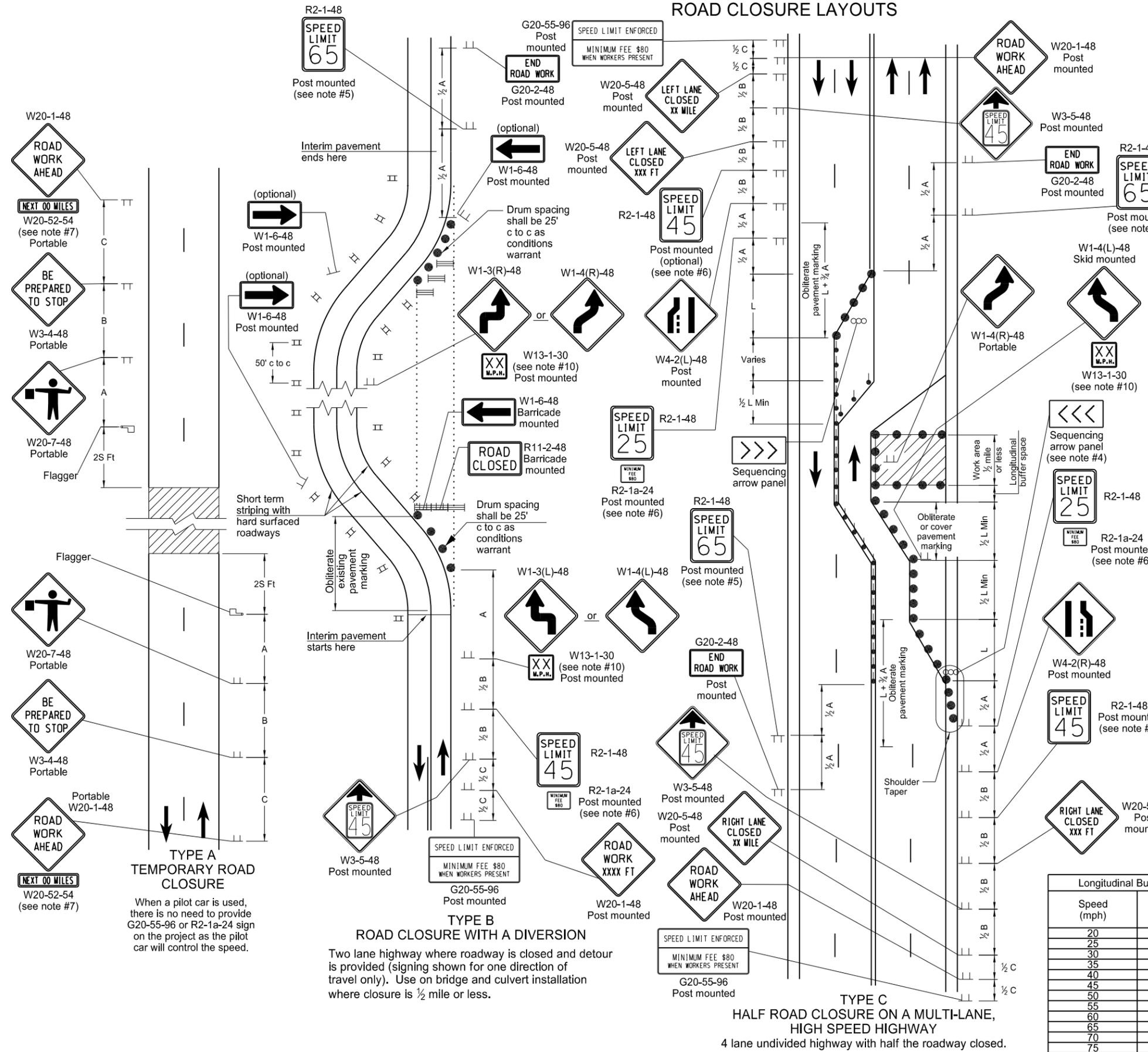
KEY

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

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

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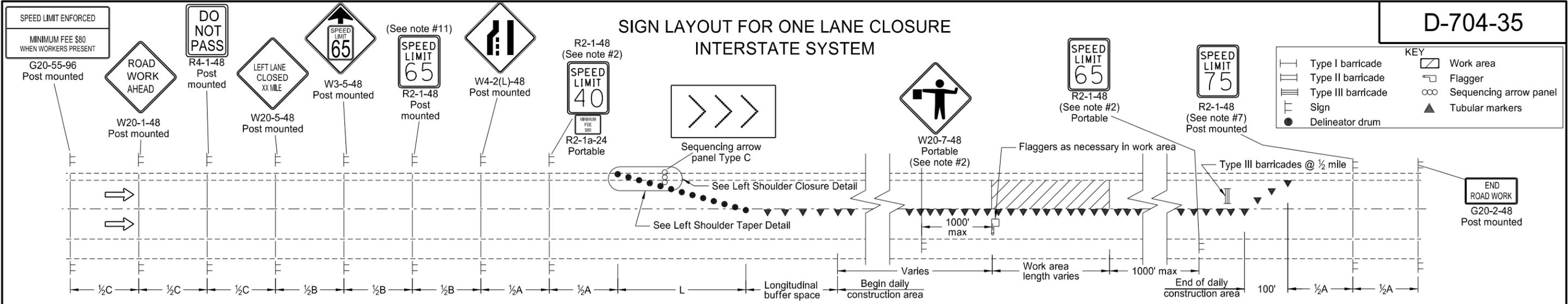


TYPE A TEMPORARY ROAD CLOSURE
When a pilot car is used, there is no need to provide G20-55-96 or R2-1a-24 sign on the project as the pilot car will control the speed.

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 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.

SIGN LAYOUT FOR ONE LANE CLOSURE INTERSTATE SYSTEM



KEY

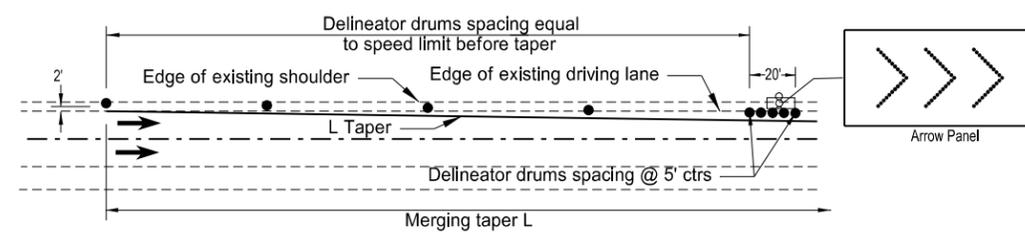
[Symbol]	Type I barricade	[Symbol]	Work area
[Symbol]	Type II barricade	[Symbol]	Flagger
[Symbol]	Type III barricade	[Symbol]	Sequencing arrow panel
[Symbol]	Sign	[Symbol]	Tubular markers
[Symbol]	Delineator drum		

LEFT LANE CLOSED WORKERS IN WORK AREA

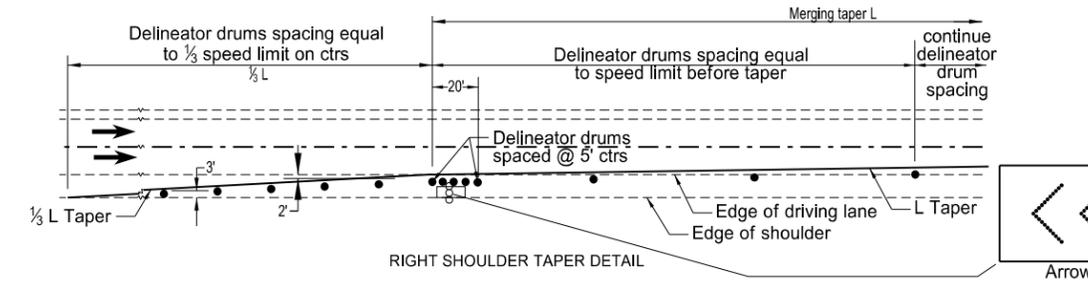
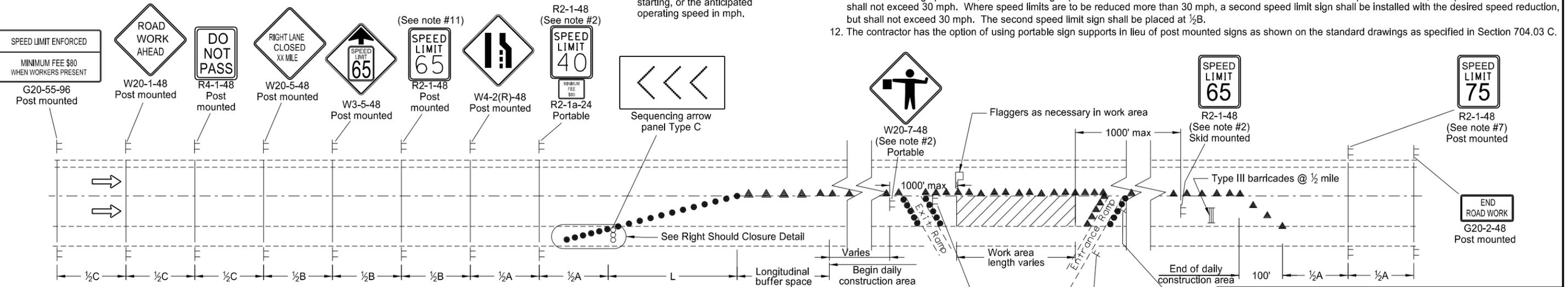
Speed (mph)*	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

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

- Notes:
- Advance signs for flagging shall be installed when flaggers are flagging.
 - The advanced flagger sign and the speed limit signs shall be moved as the work area moves through the construction zone. When the work area is not visible from the flagger, the flagger station shall be placed so the work area is visible. The 65 mph speed limit and the 40 mph speed limit sign shall be spaced at 1/2 A in advance of the flagger sign. The 65 mph speed limit sign shall also be moved. Upon completion of the work day or when workers are not present, the 65 mph speed limit, 40 mph speed limit, and the Minimum Fee \$80 signs shall be covered or removed.
 - RAMPS: When the work area encompasses an entrance ramp, the ramp shall be controlled by installing a 40 mph speed limit sign and covering any existing yield sign. Install new yield sign as necessary. When the main line 40 mph speed zone is moved past the ramp, the ramp speed limit sign shall be removed.
 - Variables:
 - S=Numerical value of speed limit or 85th percentile
 - W=The width of taper.
 - L=Minimum length of taper, or SxW for freeways, expressways, and all other roads with speeds of 45 mph or greater, or WxSxS/60 for urban, residential, and other streets with speeds of 40 mph or less.
 - 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.
 - 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.
 - 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.
 - The contractor has the option of using portable sign supports in lieu of post mounted signs as shown on the standard drawings as specified in Section 704.03 C.



Road Type	Distance Between Signs Min (ft)		
	A	B	C
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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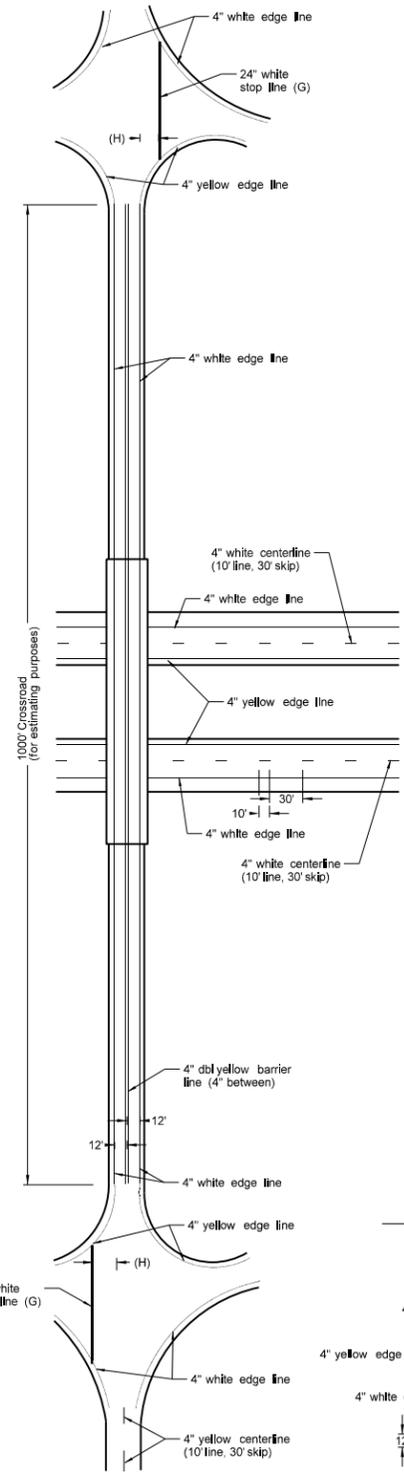
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INTERSTATE PAVEMENT MARKING 4 LANE DIVIDED HIGHWAY

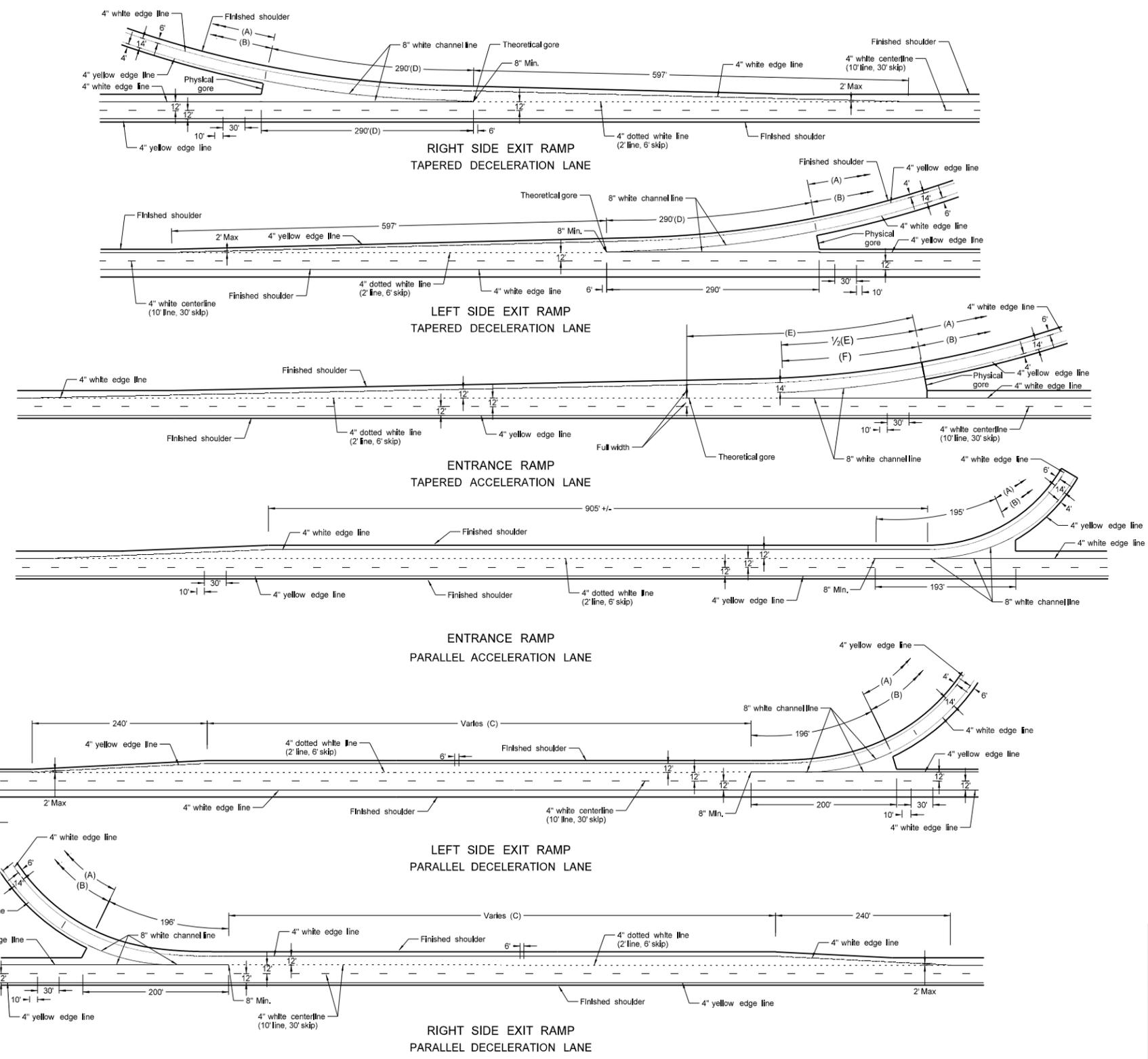
D-762-2

NOTE:

- (A) 4" White edge line
- (B) 4" Yellow edge line
- (C) Assume "varies" to equal 790' for purpose of estimate. The pavement marking shall begin at the beginning of the taper and end at the 8" line.
- (D) Beginning of physical gore to theoretical gore.
- (E) If the distance is less than 350' then extend the 8" channel line to the theoretical gore, otherwise use 195'.
- (F) 195' was used for estimating purposes.
- (G) Not required when crossroad approaches have gravel surface.
- (H) 4' minimum, 15' maximum from the nearest edge of the intersection traveled way.



CROSS-ROAD & STRUCTURE
The engineer in the field shall determine the length to be striped.



BASIS OF ESTIMATE		
LOCATION	ITEM	
Right or Left Side Exit Ramp TAPERED	8" White channel line	580 LF
	24" White stop line	60 LF
	4" White dotted line	148 LF
	4" White edge line	1115 LF
	4" Yellow edge line	1075 LF
Entrance Ramp TAPERED	8" White channel line	390 LF
	4" White dotted line	258 LF
	4" White edge line	1270 LF
	4" Yellow edge line	1075 LF
Right or Left Side Exit Ramp PARALLEL	8" White channel line	396 LF
	24" White stop line	60 LF
	4" White dotted line (C)	258 LF
	4" White edge line	1115 LF
	4" Yellow edge line	1075 LF
Entrance Ramp PARALLEL	8" White channel line	388 LF
	4" White dotted line	283 LF
	4" White edge line	1275 LF
	4" Yellow edge line	1075 LF
Main Line (Both Roadways)	4" White line, 10' line, 30' skip	2840 LF/M
	4" White edge line	10,560 LF/M
	4" Yellow edge line	10,560 LF/M
Cross Road	4" White edge line	2000 LF
	4" Dotted yellow barrier line (4" between)	2000 LF

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