

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

SD DOT	PROJECT	SECTION	SHEET
	IM-NH 0041(181)	non	1/36

Plotting Date: 01/16/2024

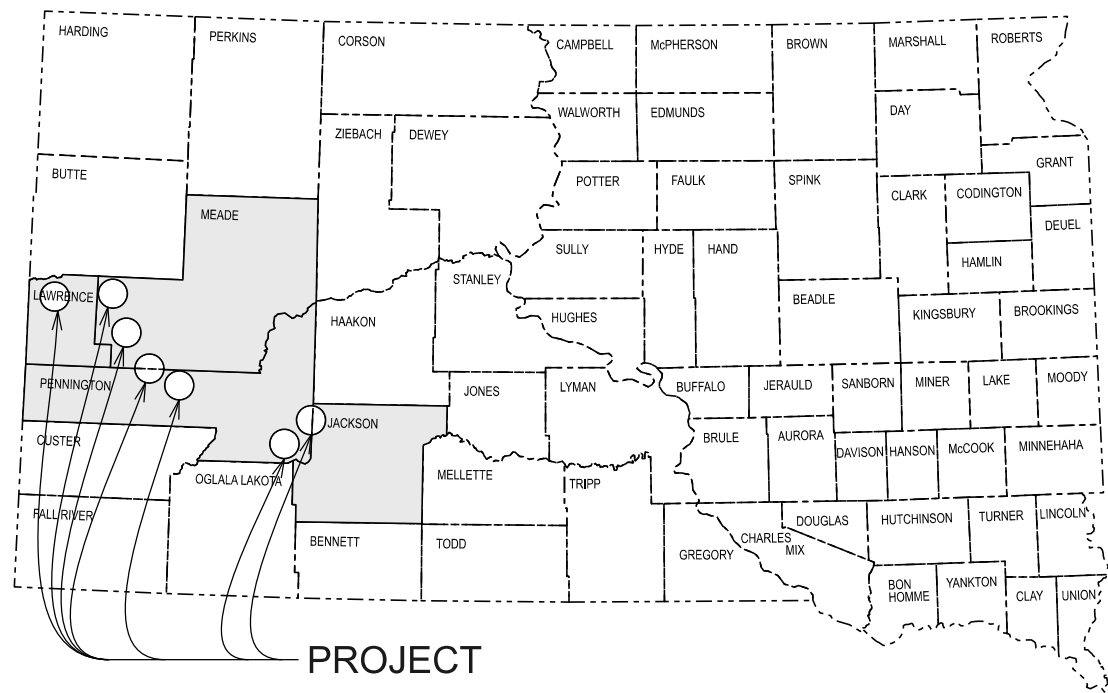
PROJECT IM-NH 0041(181)
INTERSTATE 90
SD HIGHWAY 34
US HIGHWAY 14

INDEX OF SHEETS

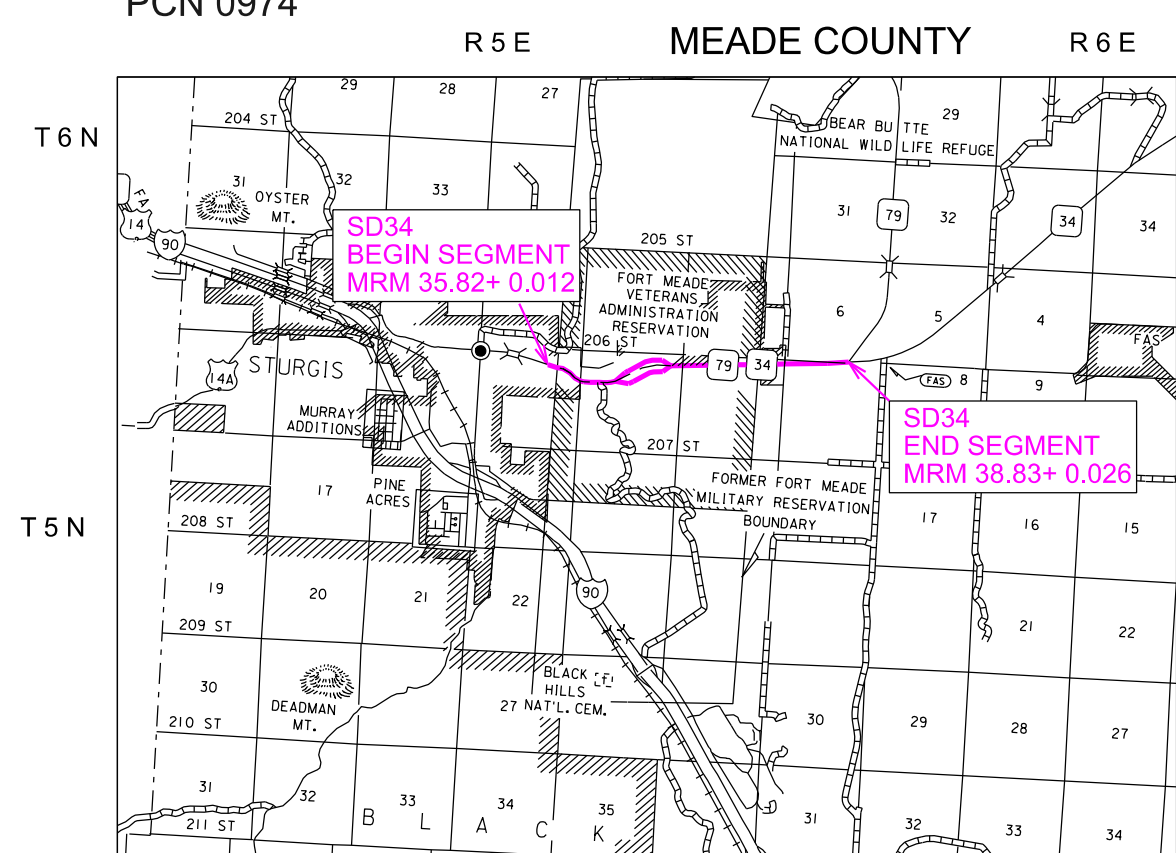
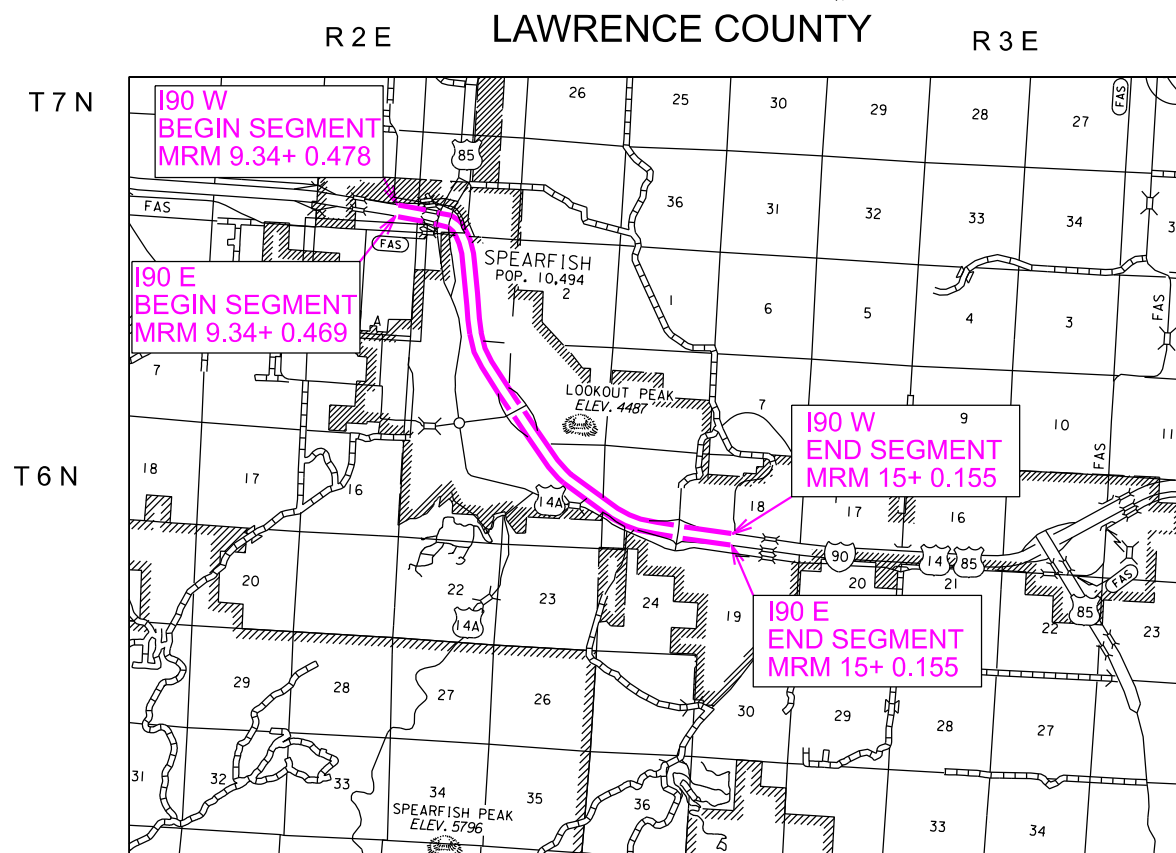
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LAWRENCE, MEADE, PENNINGTON,
AND JACKSON COUNTIES
ASPHALT SURFACE TREATMENT

PCN 0974



PROJECT



STORM WATER PERMIT
No Permit Required

DESIGN DESIGNATION (I90E)

ADT (2022)	7362
ADT (2042)	11559
DHV	1698
D	51%
T DHV	5.4%
T ADT	11.8%
V	75 MPH

Gross Length	5.284 Miles
Length of Exceptions	0.767 Miles
Net Length	4.517 Miles

DESIGN DESIGNATION (I90W)

ADT (2022)	7355
ADT (2042)	11546
DHV	1696
D	51%
T DHV	5.4%
T ADT	11.8%
V	75 MPH

Gross Length	5.279 Miles
Length of Exceptions	0.673 Miles
Net Length	4.606 Miles

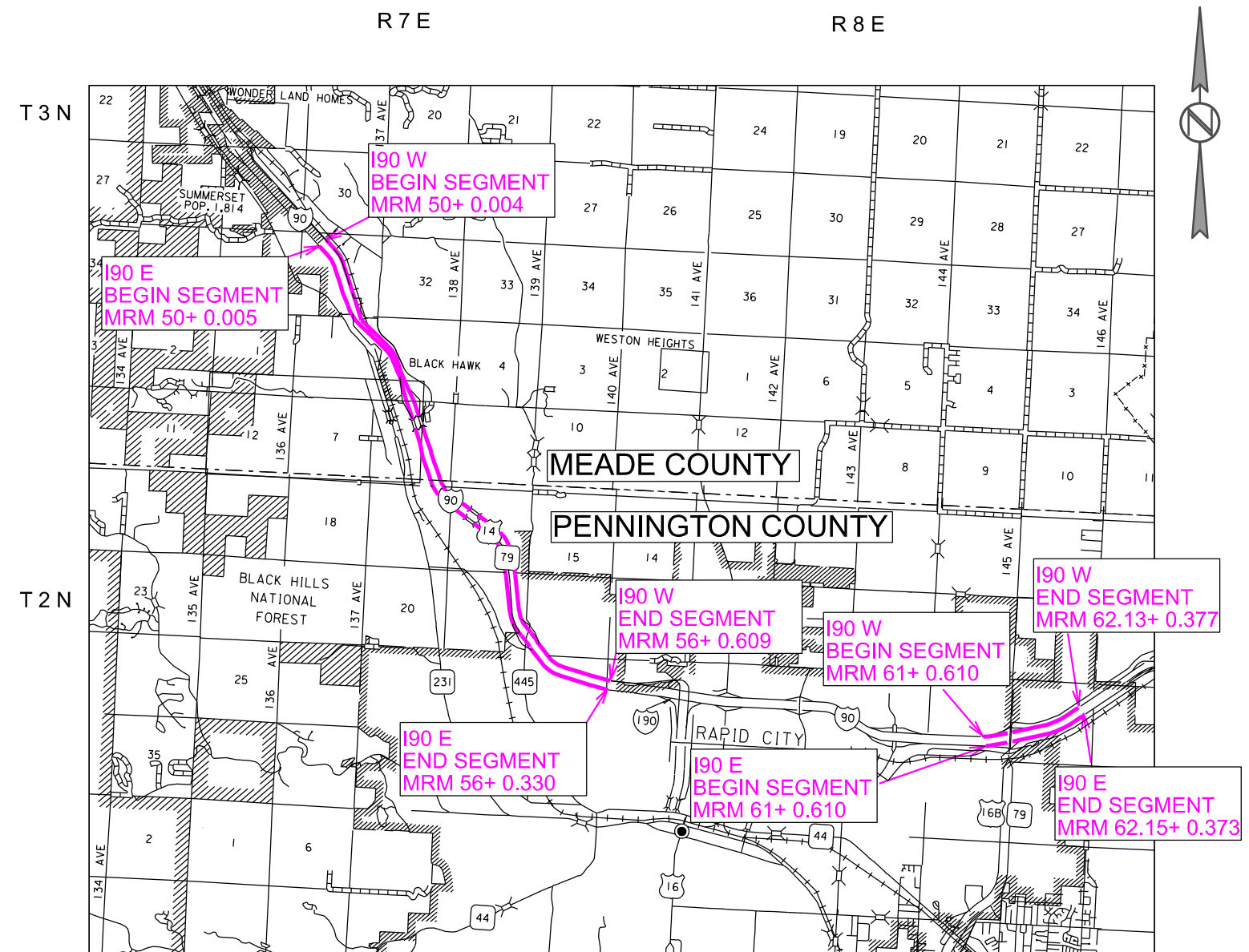
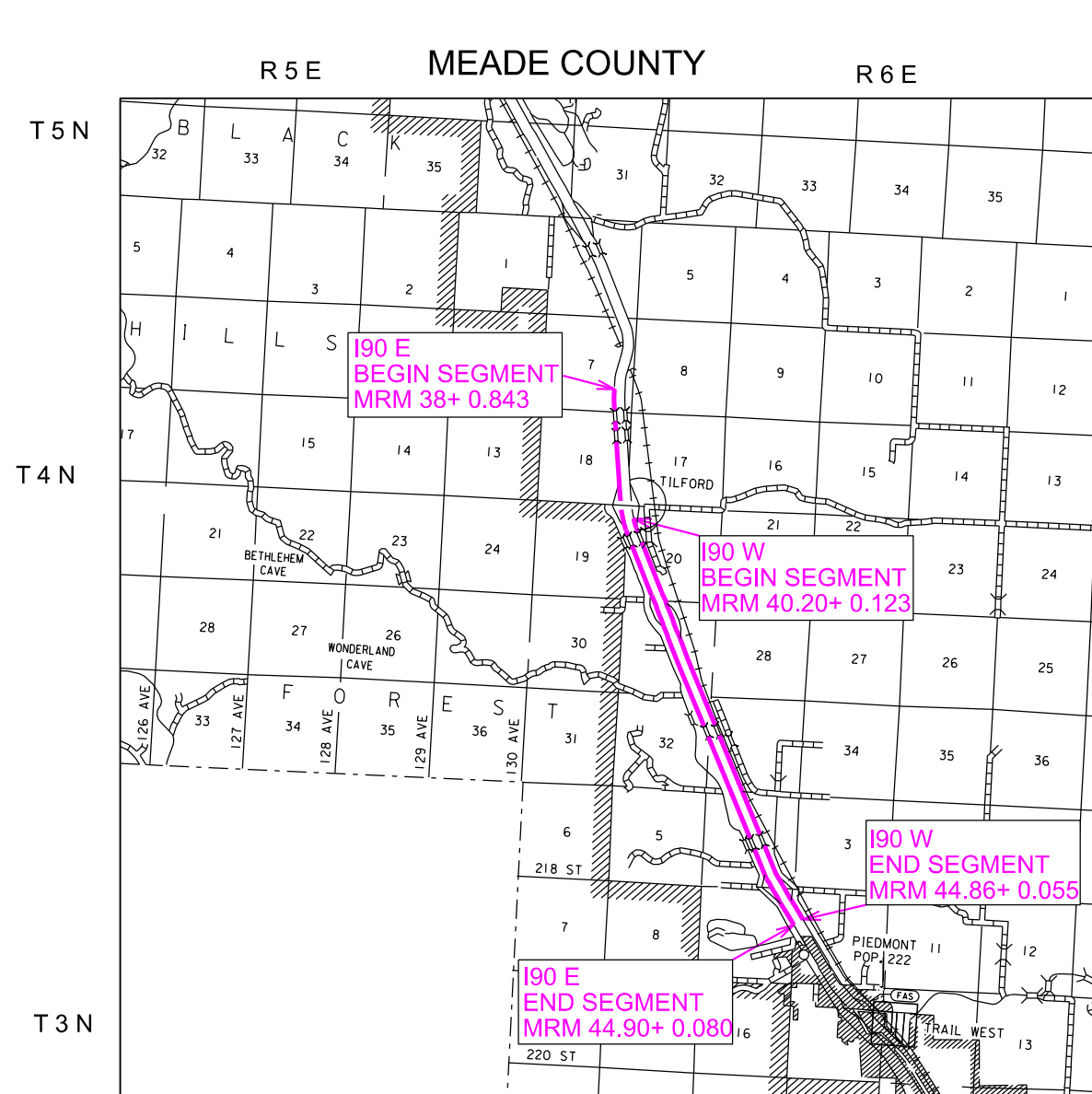
DESIGN DESIGNATION (SD34)

ADT (2022)	5577
ADT (2042)	8777
DHV	986
D	50%
T DHV	2.6%
T ADT	5.8%
V	65 MPH

Gross Length	3.003 Miles
Length of Exceptions	0.000 Miles
Net Length	3.003 Miles

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March 20, 2024



DESIGN DESIGNATION (I90E)

ADT (2022)	10872
ADT (2042)	16385
DHV	2407
D	51%
T DHV	5.5%
T ADT	12.0%
V	75 MPH

Gross Length	6.097 Miles
Length of Exceptions	0.861 Miles
Net Length	5.236 Miles

DESIGN DESIGNATION (I90W)

ADT (2022)	11492
ADT (2042)	17318
DHV	2544
D	51%
T DHV	5.3%
T ADT	11.7%
V	75 MPH

Gross Length	4.595 Miles
Length of Exceptions	0.375 Miles
Net Length	4.220 Miles

DESIGN DESIGNATION (I90E)

ADT (2022)	11638
ADT (2042)	17664
DHV	2540
D	51%
T DHV	4.9%
T ADT	10.7%
V	75 MPH

Gross Length	6.313 Miles
Length of Exceptions	0.893 Miles
Net Length	5.420 Miles

DESIGN DESIGNATION (I90W)

ADT (2022)	11642
ADT (2042)	17372
DHV	2496
D	51%
T DHV	4.9%
T ADT	10.7%
V	75 MPH

Gross Length	6.593 Miles
Length of Exceptions	0.966 Miles
Net Length	5.627 Miles

DESIGN DESIGNATION (I90E)

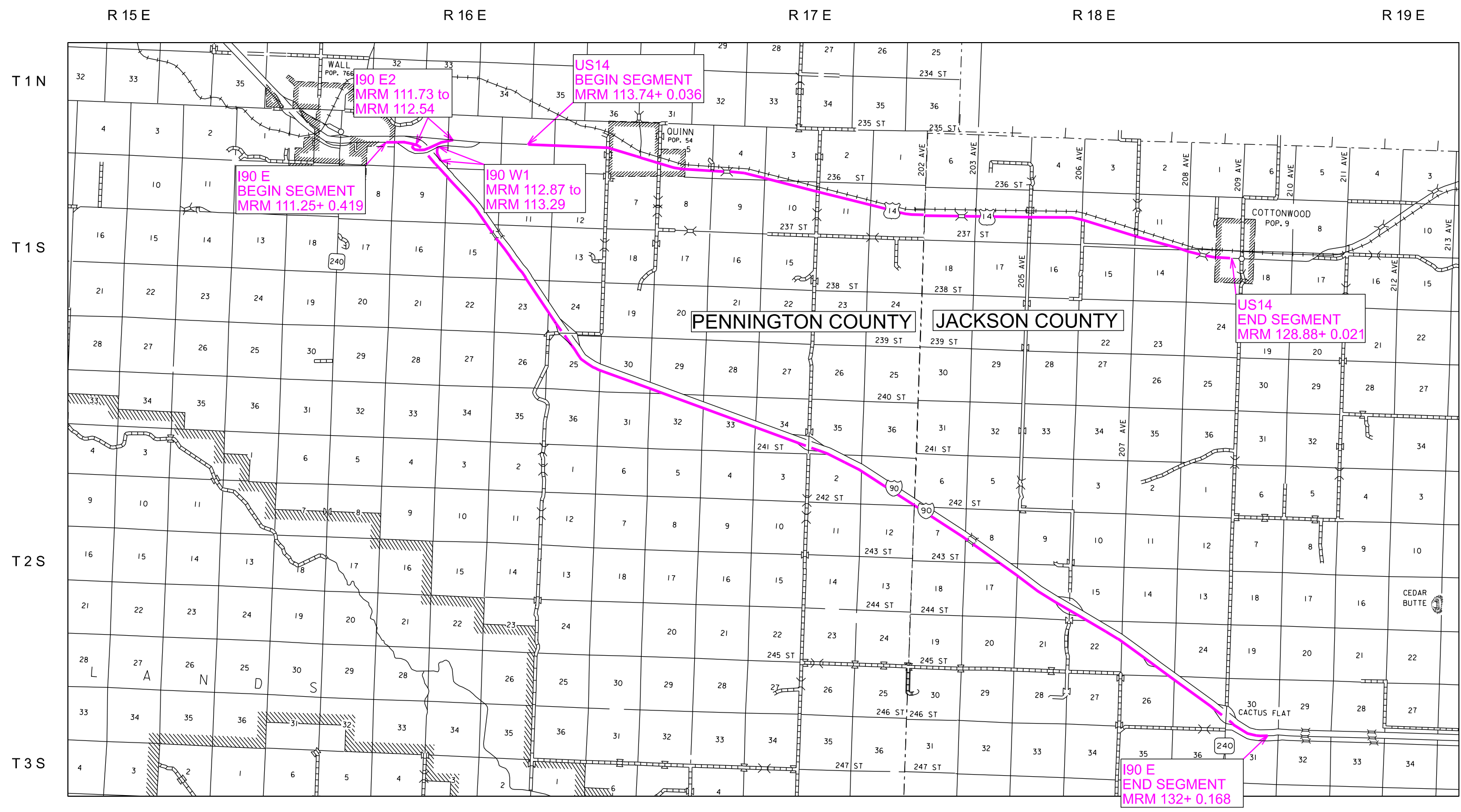
ADT (2022)	16590
ADT (2042)	24039
DHV	2541
D	50%
T DHV	3.9%
T ADT	8.5%
V	75 MPH

Gross Length	1.307 Miles
Length of Exceptions	0.333 Miles
Net Length	0.974 Miles

DESIGN DESIGNATION (I90W)

ADT (2022)	16590
ADT (2042)	24039
DHV	2540
D	50%
T DHV	3.9%
T ADT	8.5%
V	75 MPH

Gross Length	1.325 Miles
Length of Exceptions	0.193 Miles
Net Length	1.132 Miles



DESIGN DESIGNATION (I90E)

ADT (2022)	3652
ADT (2042)	5126
DHV	947
D	51%
T DHV	13.2%
T ADT	29.1%
V	80 MPH

Gross Length 20.561 Miles
 Length of Exceptions 1.314 Miles
 Net Length 19.247 Miles

DESIGN DESIGNATION (US14)

ADT (2022)	1063
ADT (2042)	1619
DHV	258
D	50%
T DHV	6.9%
T ADT	15.2%
V	65 MPH

Gross Length 14.060 Miles
 Length of Exceptions 0.043 Miles
 Net Length 14.017 Miles

ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SECTION	SHEET
	IM-NH 0041(181)	non	4/36

Revised 1/31/24 jpr

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
330E0300	SS-1h or CSS-1h Asphalt for Fog Seal	176.9	Ton
330E3000	Sand for Fog Seal	20.0	Ton
360E0044	HFMS-2 Asphalt for Surface Treatment	1,061.3	Ton
360E1030	Type 2A Cover Aggregate	376.4	Ton
360E1030	Type 2A Cover Aggregate	380.7	Ton
360E1030	Type 2A Cover Aggregate	1,318.0	Ton
360E1030	Type 2A Cover Aggregate	455.5	Ton
360E1030	Type 2A Cover Aggregate	346.0	Ton
360E1030	Type 2A Cover Aggregate	505.7	Ton
360E1030	Type 2A Cover Aggregate	499.5	Ton
360E1030	Type 2A Cover Aggregate	87.9	Ton
360E1030	Type 2A Cover Aggregate	62.4	Ton
360E1030	Type 2A Cover Aggregate	1,588.5	Ton
360E1030	Type 2A Cover Aggregate	3,782.8	Ton
360E1030	Type 2A Cover Aggregate	114.7	Ton
360E1030	Type 2A Cover Aggregate	54.4	Ton
633E1200	High Build Waterborne Pavement Marking Paint, White	1,020	Gal
633E1205	High Build Waterborne Pavement Marking Paint, Yellow	2,747	Gal
633E6005	Pavement Marking Masking, 5"	20,046	Ft
633E6010	Pavement Marking Masking, 9"	300	Ft
633E6015	Pavement Marking Masking, 13"	400	Ft
633E6020	Pavement Marking Masking, 25"	1,615	Ft
633E6025	Pavement Marking Masking, Area	157	SqFt
633E6030	Pavement Marking Masking, Arrow	20	Each
634E0010	Flagging	1,325.0	Hour
634E0020	Pilot Car	150.0	Hour
634E0110	Traffic Control Signs	6,143.9	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0275	Type 3 Barricade	8	Each
634E0320	Temporary Flexible Vertical Markers (Tabs)	54.3	Mile
634E0420	Type C Advance Warning Arrow Board	4	Each
634E0630	Temporary Pavement Marking	114.8	Mile
634E1240	Queue Detection System	2	Each

TABLE OF QUANTITIES BY HIGHWAY SEGMENT

	I90E	I90W	SD34	I90E	I90W	I90E	I90W	I90E	I90W	I90E	US14	I90 E2	I90 W1			
MRM to	9.34+ 0.469	9.34+ 0.478	35.82+ 0.012	38+ 0.843	40.20+ 0.123	50+ 0.005	50+ 0.004	61+ 0.201	61+ 0.185	111.25+ 0.419	113.74+ 0.036	111.73	112.87			
MRM	15+ 0.155	15+ 0.155	38.83+ 0.026	44.90+ 0.080	44.86+ 0.055	56+ 0.330	56+ 0.609	62.15+ 0.373	62.13+ 0.377	132+ 0.168	128.88+ 0.021	112.54	113.29	Total		
Item														Quantity	Unit	
SS-1h or CSS-1h Asphalt for Fog Seal	6.9	7.0	24.3	8.4	6.4	9.4	9.3	1.7	1.1	29.4	69.9	2.1	1.0	176.9	Ton	
Sand for Fog Seal			10.0								10.0			20.0	Ton	
HFMS-2 Asphalt for Surface Treatment	41.7	42.2	146.1	50.5	38.4	56.1	55.4	9.7	6.9	176.2	419.4	12.7	6.0	1,061.3	Ton	
Type 2A Cover Aggregate	376.4	380.7	1,318.0	455.5	346.0	505.7	499.5	87.9	62.4	1,588.5	3,782.8	114.7	54.4	9,572.5	Ton	
High Build Waterborne Pavement Marking Paint, White			209								782	20	9	1,020	Gal	
High Build Waterborne Pavement Marking Paint, Yellow	147	147	78	254	192	263	275	55	55	857	395	20	9	2,747	Gal	
Pavement Marking Masking, 5"			20,046											20,046.0	Ft	
Pavement Marking Masking, 9"			300											300.0	Ft	
Pavement Marking Masking, 13"												400		400.0	Ft	
Pavement Marking Masking, 25"			1,615											1,615.0	Ft	
Pavement Marking Masking, Area			157											157.0	SQFT	
Pavement Marking Masking, Arrow			20											20.0	Each	
Flagging	50.0	50.0	150.0	50.0	50.0	50.0	50.0	25.0	25.0	175.0	600.0	25.0	25.0	1,325.0	Hour	
Pilot Car											150.0			150.0	Hour	
Traffic Control Signs	537.8	577.8	346.4	561.8	425.9	513.8	561.8	425.9	425.9	1,035.6	476.6	127.3	127.3	6,143.9	SQFT	
Traffic Control, Miscellaneous	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	Lump Sum	LS
Temporary Flexible Vertical Markers (Tabs)			9.0								42.2	2.2	0.9	54.3	Mile	
Temporary Pavement Marking	10.6	10.6		12.2	9.2	12.6	13.2	2.6	2.7	41.1				114.8	Mile	

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.pdf> >

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Agriculture and Natural Resources.

The waste disposal site(s) will not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating, "No Dumping Allowed".

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COORDINATION BETWEEN CONTRACTORS

Guardrail Replacement on project PH 0040(356), PCN 09F3 is scheduled for the construction season of 2024. The location of this project is I90, MRM 10.30 to MRM 112.64. The Contractor on this project will coordinate with the Contractor on the Guardrail Replacement project. All costs associated with this coordination will be incidental to the various bid items on the project.

Bridge Repair on project IM 0901(200)1, PCN 07D3 is scheduled for the construction season of 2024. The location of this project is I90, MRM 8 to MRM 10. The Contractor on this project will coordinate with the Contractor on the Bridge Repair project. All costs associated with this coordination will be incidental to the various bid items on the project.

Exit 37 Interchange Reconstruction on project IM 0901(195)35, PCN 021G is scheduled for the construction season of 2024. The location of this project is I90, MRM 36.06+ 0.789 to MRM 39.32. The Contractor on this project will coordinate with the Contractor on the Exit 37 Interchange Reconstruction project. All costs associated with this coordination will be incidental to the various bid items on the project.

Exit 46 Interchange Reconstruction on project IM 0901(187)44, PCN 034J is scheduled for the construction season of 2024. The location of this project is I90, MRM 44.90+ 0.080 to MRM 47.56+ 0.070. The Contractor on this project will coordinate with the Contractor on the Exit 46 Interchange Reconstruction project. All costs associated with this coordination will be incidental to the various bid items on the project.

Sprayable Durable Pavement Marking on project PH 0040(324), PCN 05GC is scheduled for the construction season of 2024. The location of this project is I90, MRM 47+ 0.080 to MRM 67.50+ 0.000. The Contractor on this project will coordinate with the Contractor on the Sprayable Durable Pavement Marking project. All costs associated with this coordination will be incidental to the various bid items on the project.

Cold Plastic Durable Pavement Marking on project PH 0040(239), PCN 05GA is scheduled for the construction season of 2024. The location of this project is I90, MRM 47 to MRM 67.55. The Contractor on this project will coordinate with the Contractor on the Cold Plastic Durable Pavement Marking project. All costs associated with this coordination will be incidental to the various bid items on the project.

High Friction Surface Treatment on project PH 0040(338), PCN 06U3 is scheduled for the construction season of 2024. The location of this project is I90E, MRM 50+ 0.106 to MRM 50+ 0.391 and I90E, MRM 57.62 to MRM 57.95. The Contractor on this project will coordinate with the Contractor on the High Friction Surface Treatment project. All costs associated with this coordination will be incidental to the various bid items on the project.

The Contractor will schedule work so as not to interfere with or hinder the progress of the work performed by the other Contractors. Conflicting traffic control devices may need to be temporarily adjusted or removed as directed by the Engineer and at no additional cost to the contract.

ASPHALT SURFACE TREATMENT RATES OF MATERIALS

HFMS-2 Asphalt for Surface Treatment applied 0.30 gallons per square yard.

Type 2A Cover Aggregate applied 23 pounds per square yard.

SS-1h or CSS-1h Emulsified Asphalt for Fog Seal applied 0.05 gallons per square yard.

FOG SEAL APPLICATION

The Fog Seal will be applied within 1 to 4 days following the placement of the cover aggregate.

FOG SEAL

The fog seal will be placed following the completion of the asphalt surface treatment. Prior to the application of the fog seal, the Contractor will be required to broom the asphalt surface treatment. A CSS-1h or SS-1h emulsion will be used for the fog seal application. A water-to-emulsion rate of 1:1 should be used for the Fog Seal application.

The Contractor will fog seal the entire asphalt surface treatment surface.

The Contractor will plan the fog seal operation to allow adequate cure time for the fog seal and to minimize/eliminate the need to apply Sand for Fog Seal.

If adequate cure time for the Fog Seal is not available, to facilitate traffic, the Contractor will be allowed to place a minimum sufficient amount of blotting sand on the fog seal to allow traffic to cross the uncured portion of the fog seal, as permitted by the Engineer.

Sand for Fog Seal is only intended to be placed for accesses to businesses, intersection crossings, and as determined by the Engineer to facilitate traffic movements. Sand for Fog Seal will not be placed to accelerate the Contractor's schedule.

Sand that is applied will be broomed off the surface of the roadway once the fog seal has sufficiently cured as determined by the Engineer.

Sand for Fog Seal will conform to Section 879.1.B.

Prior to hauling, Sand for Fog Seal will be screened to minimize segregation, eliminate oversize, and effectively breakup or discard material bonded into chunks. All costs for supplying, hauling, placing, and brooming the blotting sand will be incidental to the contract unit price per ton for Sand for Fog Seal.

BROOMING

Upon completion of brooming operations a windrow of cover aggregate will not exist along the edge of the roadway. This material will be leveled to match the existing inslopes. Any remaining windrows of cover aggregate will be removed by the Contractor at the Contractor's expense.

TRANSVERSE RUMBLE STRIPS

If transverse rumble strips are located on a segment they will not be disturbed. The Contractor will only apply a fog seal to these rumble strips.

CENTERLINE AND EDGE LINE RUMBLE STRIPS

If centerline or edge line rumble strips exist, they will be covered with the cover aggregate to avoid trapping too much water within the rumble strip during rain events.

BRIDGES AND APPROACH SLABS

Asphalt surface treatment will not be placed on any bridges or approach slabs along the project. Bridge joints will be covered with an approved masking material to prevent the asphalt surface treatment from coming in contact with the bridge and/or bridge joint. All loose aggregate will be cleaned from the bridge and around the guardrail posts. All costs associated with this work will be incidental to the asphalt surface treatment bid items.

TABLE OF PICKUP BROOM LOCATIONS

Hwy.	MRM to	MRM	Description
SD34	35.1+ 0.796	36+ 0.457	Curb and Gutter

Revised 1/31/24 jpr

TABLE OF MATERIAL QUANTITIES

Highway	MRM to		MRM		Mileage to	Mileage	Total Length	Total Length	Length Exceptions	Net Length	Width	Type 2A Cover Aggregate		HFMS-2 Asphalt for Surface Treatment		SS-1h or CSS-1h Asphalt for Fog Seal	
							(miles)	(ft)	(ft)	(ft)	(ft)	(ton)	(tons/mile)	(ton)	(tons/mile)	(ton)	(tons/mile)
I90E 8' shoulder	9.34+	0.469	15+	0.155	9.719	15.003	5.284	27900	4050	23850	8	243.8	54	27.0	6.0	4.5	1.0
I90E 4' shoulder	9.34+	0.469	15+	0.155	9.719	15.003	5.284	27900	1964	25936	4	132.6	27	14.7	3.0	2.4	0.5
							Segment Total	10.568	55799			Segment Total	376.4	41.7		6.9	
I90W 8' shoulder	9.34+	0.478	15+	0.155	9.729	15.008	5.279	27873	3554	24319	8	248.6	54	27.6	6.0	4.6	1.0
I90W 4' shoulder	9.34+	0.478	15+	0.155	9.729	15.008	5.279	27873	2028	25845	4	132.1	27	14.6	3.0	2.4	0.5
							Segment Total	10.558	55746			Segment Total	380.7	42.2		7.0	
SD34, 4 lanes C&G	35.82+	0.012	36+	0.340	29.381	29.849	0.468	2471		2471	48	151.6	324	16.8	35.9	2.8	6.0
5 lanes C&G	36+	0.340	36+	0.447	29.849	29.956	0.107	565		565	60	43.3	405	4.8	44.9	0.8	7.5
5 lanes	36+	0.447	37.12+	0.000	29.956	30.028	0.072	380		380	60	29.1	404	3.2	44.4	0.5	6.9
4 lanes divided	36.52+	0.003	37.12+	0.000	0.000	0.585	0.585	3089		3089	70	276.3	472	30.6	52.3	5.1	8.7
5 lanes	37.12+	0.001	37.12+	0.371	30.029	30.399	0.370	1954		1954	72	179.7	486	19.9	53.8	3.3	8.9
4 lanes	37.12+	0.371	38+	0.130	30.399	30.999	0.600	3168		3168	64	259.1	432	28.7	47.8	4.8	8.0
5 lanes	38+	0.130	38+	0.195	30.999	31.064	0.065	343		343	72	31.6	486	3.5	53.8	0.6	9.2
6 lanes	38+	0.195	38+	0.304	31.064	31.173	0.109	576		576	88	64.7	594	7.2	66.1	1.2	11.0
5 lanes	38+	0.304	38+	0.350	31.173	31.219	0.046	243		243	72	22.3	485	2.5	54.3	0.4	8.7
4 lanes	38+	0.350	38+	0.814	31.219	31.683	0.464	2450		2450	64	200.3	432	22.2	47.8	3.7	8.0
5 lanes	38+	0.130	38.83+	0.026	31.683	31.800	0.117	618		618	76	60.0	513	6.7	57.3	1.1	9.4
							Segment Total	3.003	15856			Segment Total	1318.0	146.1		24.3	
I90E 8' shoulder	38+	0.843	44.90+	0.080	38.648	44.745	6.097	32192	4544	27648	8	282.6	54	31.3	6.0	5.2	1.0
I90E 4' shoulder	38+	0.843	44.90+	0.080	38.648	44.745	6.097	32192	1259	30933	4	158.1	27	17.5	3.0	2.9	0.5
Additional Quantities												14.8		1.7		0.3	
							Segment Total	12.194	64384			Segment Total	455.5	50.5		8.4	
I90W 8' shoulder	40.20+	0.123	44.86+	0.055	40.216	44.811	4.595	24262	1982	22280	8	227.7	54	25.3	6.0	4.2	1.0
I90W 4' shoulder	40.20+	0.123	44.86+	0.055	40.216	44.811	4.595	24262	1125	23137	4	118.3	27	13.1	3.0	2.2	0.5
							Segment Total	9.190	48523			Segment Total	346.0	38.4		6.4	
I90E 8' shoulder	50+	0.005	56+	1.020	49.905	56.908	7.003	36976	4717	32259	8	329.8	54	36.6	6.0	6.1	1.0
I90E 4' shoulder	50+	0.005	56+	0.609	49.905	56.497	6.592	34806	390	34416	4	175.9	27	19.5	3.0	3.3	0.5
							Segment Total	13.595	71782			Segment Total	505.7	56.1		9.4	
I90W 8' shoulder	50+	0.004	56+	0.973	49.947	56.904	6.957	36733	5098	31635	8	323.4	54	35.9	6.0	6.0	1.0
I90W 4' shoulder	50+	0.004	56+	0.609	49.947	56.540	6.593	34811	354	34457	4	176.1	27	19.5	3.0	3.3	0.5
							Segment Total	13.550	71544			Segment Total	499.5	55.4		9.3	
I90E 8' shoulder	61+	0.201	62.15+	0.373	61.158	62.465	1.307	6901	1756	5145	8	52.6	54	5.8	6.0	1.0	1.0
I90E 4' shoulder	61+	0.201	62.15+	0.373	61.158	62.465	1.307	6901		6901	4	35.3	27	3.9	3.0	0.7	0.5
							Segment Total	2.614	13802			Segment Total	87.9	9.7		1.7	
I90W 8' shoulder	61+	0.610	62.13+	0.377	61.598	62.498	0.900	4752	1020	3732	8	38.1	54	4.2	5.9	0.7	1.0
I90W 4' shoulder	61+	0.610	62.13+	0.377	61.598	62.498	0.900	4752		4752	4	24.3	27	2.7	3.0	0.4	0.4
							Segment Total	1.800	9504			Segment Total	62.4	6.9		1.1	

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TABLE OF MATERIAL QUANTITIES (CONTINUED)

Highway							Total Length	Total Length	Length Exceptions	Net Length	Width	Type 2A Cover Aggregate	HFMS-2 Asphalt for Surface Treatment	SS-1h or CSS-1h Asphalt for Fog Seal			
I90E 8' shoulder	111.25+	0.419	132+	0.168	111.902	132.463	20.561	108562	6940	101622	8	1038.8	54	115.2	6.0	19.2	1.0
I90E 4' shoulder	111.25+	0.419	132+	0.168	111.902	132.463	20.561	108562	1003	107559	4	549.7	27	61.0	3.0	10.2	0.5
							Segment Total	41.122	217124			Segment Total	1588.5	176.2		29.4	
US14	113.74+	0.036	128.88+	0.021	0.036	14.096	14.060	74237	226	74011	40	3782.8	270	419.4	29.9	69.9	5.0
							Segment Total	14.060	74237			Segment Total	3782.8	419.4		69.9	
I90 E2	111.73+	0.000	112.54+	0.000	0.000	0.730	0.730	3854	401	3453	26	114.7	175	12.7	19.4	2.1	3.2
							Segment Total	0.730	3854			Segment Total	114.7	12.7		2.1	
I90 W1	112.87+	0.000	113.29+	0.000	0.000	0.310	0.310	1637	0	1637	26	54.4	175	6.0	19.4	1.0	3.2
							Segment Total	0.310	1637			Segment Total	54.4	6.0		1.0	
							Total Length	133.294	703792								

TABLE OF EXCEPTIONS

Highway	MRM	Structure Number	Length (ft)
I90E	9.96	Ramp	272
I90E	10.08	41091059	983
I90E	10.72	Ramp	361
I90E	12.27	Ramp	264
I90E	12.62	Ramp	308
I90E	13.61	41110086	981
I90E	14.05	Ramp	450
I90E	14.90	Ramp	431
I90W	9.97	Ramp	240
I90W	10.08	41091058	977
I90W	10.52	Ramp	256
I90W	12.04	Ramp	260
I90W	12.65	Ramp	250
I90W	13.61	41110085	1051
I90W	13.97	Ramp	260
I90W	14.77	Ramp	260
I90E	39.32	Ramp	1500
I90E	39.88	Ramp	769
I90E	40.58	Ramp	458

I90E	41.17	Ramp	261
I90E	41.66	Ramp	297
I90E	42.81	47080535	405
I90E	44.10	47085546	396
I90E	44.66	47088551	458
I90W	41.32	Ramp	297
I90W	41.81	Ramp	264
I90W	42.81	47080534	401
I90W	44.10	47085545	324
I90W	44.40	Ramp	296
I90W	44.66	47088550	400
I90E	51.93	Ramp	518
I90E	52.80	Ramp	1610
I90E	53.93	52383264	390
I90E	55.49	Ramp	589
I90E	55.87	Ramp	1610
I90W	51.93	Ramp	1615
I90W	52.80	Ramp	513
I90W	53.93	52383263	354
I90W	55.45	Ramp	1810

I90W	55.45	Ramp	1810
I90W	55.82	Ramp	806
I90E	62.09	Ramp	1756
I90W	62.13	Ramp	1020
I90E	112.30	Ramp	976
I90E	112.54	Ramp	157
I90E	116.62	Ramp	278
I90E	116.94	52953400	264
I90E	117.17	Ramp	285
I90E	121.70	Ramp	317
I90E	121.98	52A00420	211
I90E	122.31	Ramp	264
I90E	125.53	36071077	290
I90E	127.40	Ramp	180
I90E	127.73	36090088	238
I90E	128.08	Ramp	259
I90E	130.95	Ramp	185
I90E	131.59	Ramp	261
I90 E2	112.21	52925365	401
US14	123.83	36067016	98
US14	128.44	36112021	128
		Total	31512

TABLE OF ADDITIONAL QUANTITIES

I-90 E	# of locations	Type 2A Cover Aggregate (tons)	HFMS-2 Asphalt for Surface Treatment	Asphalt for Fog Seal (tons)
MRM 41.3 to 41.5, 20' Paved Ditch	1	14.9	1.7	0.3
Total:		14.8	1.7	0.3

RATES OF MATERIALS FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

Solid 4" line = 27.8 Gals/Mile
Dashed 4" line = 7.6 Gal/Mile
Glass Beads = 8 Lbs/Gal.

Solid 6" line = 41.7 Gals/Mile
Glass Beads = 8 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings will be incidental to the contract unit price for the respective High Build Waterborne Pavement Marking Paint items.

PAVEMENT MARKING MASKING

Just prior to beginning the asphalt surface treatment, all pavement marking tape will be covered with an approved pavement marking masking material. The masking will protect the pavement marking tape from oil and aggregates. Tabs will be placed on each masking line to provide a guide for locating the masking material after the surface treatment has been applied. Masking application ahead of the surface treatment will not exceed the amount estimated for the current day's operation. Upon completion of the fog seal, all masking material will be removed and disposed of by the Contractor.

Typical masking products may require multiple layers installed prior to the asphalt surface treatment. The estimated quantity for payment is for one installation even though multiple layers of masking material was installed. Separate measurement and payment for each layer of masking material installed and removed will not be made.

The Contractor will remove and dispose of the masking material after completion of the work.

All costs associated with this work will be incidental to the various contract items for Pavement Marking Masking.

PERMANENT PAVEMENT MARKING – GENERAL NOTES

The Contractor will survey and mark the location of no passing zones prior to covering pavement marking.

The Contractor will repaint all the existing pavement marking paint including centerline, edge line, lane lines, arrows, gore areas, etc. The Contractor will be required to inventory and mark, with appropriately colored tabs, the extent and location of the existing word messages, turn arrows, stop bars, railroad crossings, pedestrian crossings, gore areas, etc. before the markings are obliterated. Locations of pavement marking tape will be masked. The Contractor will provide a copy of the pavement marking inventory to the Engineer. All costs associated with this work will be incidental to the various pavement marking bid items.

Application of permanent pavement marking may begin no sooner than 7 calendar days following completion of the fog seal and will be completed within 14 calendar days following completion of the fog seal.

HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

All materials will be applied as per manufacturer's recommendations. High build waterborne pavement marking paint will conform to the supplemental specifications for Section 980.1 B.

Reflective media will consist of glass beads.

TABLE OF PAVEMENT MARKING QUANTITIES

Revised 1/18/24 jpr

Highway	MRM to		MRM		Total Length (miles)	High Build Waterborne Pavement Marking Paint, White (Gal)	High Build Waterborne Pavement Marking Paint, Yellow (Gal)	Temporary Flexible Vertical Markers (Tabs) (Mile)	Temporary Pavement Marking (Mile)	
I90E 4' shoulder	9.34+	0.469	15+	0.155	5.284		147		10.6	
I90W 4' shoulder	9.34+	0.478	15+	0.155	5.279		147		10.6	
SD34	35.82+	0.012	38.83+	0.026	3.003	209	78	9.0		
* I90E 4' shoulder	38+	0.843	44.90+	0.080	6.097		254		12.2	
* I90W 4' shoulder	40.20+	0.123	44.86+	0.055	4.595		192		9.2	
* I90E 4' shoulder	50+	0.005	56+	0.330	6.313		263		12.6	
* I90W 4' shoulder	50+	0.004	56+	0.609	6.593		275		13.2	
* I90E 4' shoulder	61+	0.201	62.15+	0.373	1.307		55		2.6	
* I90W 4' shoulder	61+	0.185	62.13+	0.377	1.325		55		2.7	
* I90E 4' shoulder	111.25+	0.419	132+	0.168	20.561		857		41.1	
US14	113.74+	0.036	128.88+	0.021	14.060	782	395	42.2		
I90 E2	111.73+	0.000	112.54+	0.000	0.730	20	20	2.2		
I90 W1	112.87+	0.000	113.29+	0.000	0.310	9	9	0.9		
					Totals	75.457	1020	2747	54.3	114.8

* These segments have 6" marking

TABLE OF PAVEMENT MARKING MASKING

Hwy.	Begin MRM	End MRM	Description	Pavement Marking Masking, 5" (Ft)	Pavement Marking Masking, 13" (Ft)	Pavement Marking Masking, 25" (Ft)	Pavement Marking Masking, Area SqFt	Pavement Marking Masking, Arrow (Each)	Pavement Marking Masking, 9" (Ft)
SD34	36.28	38.83	5 lane section	20046		1615	157	20	300
I90 E2	111.73	112.54	Ramp Gore		400				
			Segment Total	20046	400	1615	157	20	300

TEMPORARY PAVEMENT MARKING

Temporary Flexible Vertical Markers (Tabs) will be required on the project except for I-90. Pavement marking paint will be required for the yellow line along the inside shoulder on I-90.

The total length of no passing zones are estimated at 3.5 miles on US14 (MRM 113.74+ 0.036 to MRM 128.88+ 0.021).

It is estimated that 22 DO NOT PASS (R4-1) and 20 PASS WITH CARE (R4-2) signs will be required on US14 (MRM 113.74+ 0.036 to MRM 128.88+ 0.021) to mark the no passing zones.

Temporary flexible vertical markers (tabs) will be installed on one side of the centerline rumble for the temporary pavement marking. No passing zones will be marked in accordance with Specifications. DO NOT PASS (R4-1) and PASS WITH CARE (R4-2) signs will also be used in addition to the temporary flexible vertical markers (tabs) placed per Specifications to mark no passing zones.

Covers on the tabs will be sufficiently secured to prevent traffic from dislodging the cover and when removed, the covers will be properly disposed of. The Contractor will remove and properly dispose of the tabs after permanent pavement marking is applied. Method of removal will be nondestructive to the road surface and will be accomplished within one week of completion of the permanent pavement marking.

Full reflectivity of all temporary flexible vertical markers (tabs) is required at all times. The Contractor will be required to replace any missing or non-reflective tabs after each installation as detailed below at no additional cost to the State.

Quantities of Temporary Pavement Markings consist of:

- One pass prior to the chip seal
- One pass after the chip seal
- One pass after the fog seal

In the absence of a signed lane closure or pilot car operation, FLAGGER (W20-7) symbol signs and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights will be positioned on the shoulder in advance of workers for both directions of traffic during the installation and removal of the temporary flexible vertical markers (tabs). The traffic control device used will be moved intermittently to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1) sign, a WORKER (W21-1) symbol sign or a BE PREPARED TO STOP (W3-4) sign will be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work must be approved by the Engineer.

Prior to nightfall, tabs will be required to mark centerline on segments of roadway where existing centerline markings have been removed and new markings have not been installed.

SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work.

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

Portable sign supports will not be located on sidewalks, bicycle facilities, or other areas designated for pedestrian or bicycle traffic.

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking.

All haul trucks will be equipped with an additional flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights will be incidental to the various related contract items.

Traffic will be maintained on the driving lanes. Use of the shoulder as a driving lane will not be permitted. Any damage to the shoulder due to rerouted traffic or Contractor's equipment will be repaired at no expense to the Department.

The Contractor will furnish, install, maintain, and remove TRUCK CROSSING (W8-6) signs daily. The TRUCK CROSSING signs will be displayed always when haul vehicles are hauling material. When hauling conditions no longer exist, the signs will be covered or removed from view. The exact number and location will be determined during construction. Payment for additional signs will be based on the contract unit price per square foot for "Traffic Control Signs".

A mobile work operation will be allowed provided the rumble strip or rumble stripe grooving, flush sealing, and pavement marking can be completed satisfactorily by a continuously moving work operation. A mobile work operation will require approval by the Engineer.

A Type 3 Barricade will be installed at the end of a lane closure taper as detailed in these plans.

Construction vehicles will exit or enter the construction work zone at locations identified by the Engineer. At no time will construction vehicles utilize the maintenance crossovers or the interstate median to exit or enter interstate traffic.

Lane closures will be removed prior to nightfall, except for SD34.

QUEUE DETECTION SYSTEM

The Contractor will furnish and install a Queue Detection System for I-90 westbound and eastbound prior to the construction zone.

The Queue Detection System will be capable of detecting slowed and stopped traffic prior to and within the work zone for up to two miles. The system will be capable of detecting slowed and stopped traffic prior to and within the work zone and warn drivers of traffic congestion.

The Contractor will ensure the Queue Detection System is always operational.

The system will display the following messages depending on the traffic conditions detected:

During times of free flowing traffic, Portable Changeable Message Signs will be blank when not required for end-of-queue detection or incident management.

During times of moderate congestion and slow speeds (30 mph to 55 mph): "SLOWED TRAFFIC AHEAD" and "REDUCE SPEED" will be displayed.

During times of major congestion, very slow or stopped traffic (30 mph or less): "STOPPED TRAFFIC" and "REDUCE SPEED" will be displayed.

There will be four message boards for each direction of travel on I-90.

Portable Changeable Message Sign locations are dependent of site, traffic, and operational conditions. Locations of Portable Changeable Message Signs will be approved by the Engineer.

When road work begins on the project, the Contractor will be responsible for the operation (to include initial and daily system setup and programming) and the continued maintenance (to include adjustment and replacement of any parts or materials or appurtenances when necessary) required of the Queue Detection System. The Contractor's operation and maintenance responsibility will end upon the Engineer's acceptance of the work on the project.

QUEUE DETECTION SYSTEM (CONTINUED)

STATE OF SOUTH DAKOTA	PROJECT	SECTION	SHEET
	IM-NH 0041(181)	non	12/36

Queue Detection System operation or maintenance work is required to be performed by the Contractor when project conditions dictate, lane closure change, the flow of I-90 mainline or interchange ramp traffic is impeded, a potential risk to the public exists or when equipment breaks down or malfunctions.

The more serious situations require a high priority response and are to be reacted to as quickly as circumstances allow.

The Contractor should plan for sufficient staff for the operation, maintenance, adjustment, materials and replacement of the Queue Detection System. The individual(s) responsible for installation, operations and maintenance of the Queue Detection System will be experienced, knowledgeable, and trained with respect to installation, setup, operation and maintenance of the Queue Detection System.

Relocation of sensor trailers and Portable Changeable Message Signs will be required as part of the work involved in maintaining the Queue Detection System.

In the event of failure, the Contractor will furnish necessary advance flaggers to safely control or warn traffic until the Queue Detection System is operational. The Contractor will furnish the flaggers within one hour of initial awareness of the Queue Detection System failure.

The Contractor will be required to secure Portable Changeable Message Signs in the proper positions. All Portable Changeable Message Signs and any sensor trailers will be marked with a minimum of two reflectorized drums.

The detectors will be capable of detecting traffic speeds in 5 Mile Per Hour increments and relaying information to detection systems for preset thresholds. The system is required to detect end of queue and once detected, provide adequate notification and warning. As the end of queue continues to back up, the notification and warning will be extended.

All costs for furnishing, installing, maintenance, operation, relocation, including all equipment such as Portable Changeable Message Signs, detection, and all miscellaneous parts and materials will be incidental to contract unit price per each for Queue Detection System.

TRAFFIC CONTROL FOR ASPHALT SURFACE TREATMENT

The Contractor will furnish, install, and maintain LOOSE GRAVEL (W8-7) signs with 40 MPH (W13-1P) advisory speed plaques upon start of surface treatment operations at each end of the segment and on either side of intersecting asphalt roads and major intersections as determined by the Engineer. In addition, LOOSE GRAVEL signs with 40 MPH advisory speed plaques will be installed at no more than 4 mile intervals throughout each segment. The 40 MPH advisory speed plaque should not be installed with LOOSE GRAVEL signs in areas where the posted speed limit is less than 40 MPH. LOOSE GRAVEL signs and 40 MPH advisory speed plaques will be covered or removed from view when they are not applicable.

ROAD WORK NEXT XX MILES (G20-1), LOOSE GRAVEL (W8-7) with 40 MPH (W13-1P) advisory speed plaques, and END ROAD WORK (G20-2) signs are the only signs that need to be mounted on fixed location breakaway sign supports, as shown on the plan layout.

Until the end of each day's chip seal operations, at the discretion of the Contractor, additional flaggers and FLAGGER (W20-7) symbol signs will be provided to alert the traveling public entering completed portions of the project to the potential of airborne chips.

The flaggers will provide each motorist with a printed notice on the Contractor's letterhead similar to the one shown below. Cost of the notice will be incidental to other contract items.

CONTRACTOR'S LETTERHEAD

THIS HIGHWAY IS BEING RESURFACED WITH A ROCK CHIP SEAL COAT.

THIS TYPE OF CONSTRUCTION HAS THE POTENTIAL OF CAUSING VEHICLE DAMAGE SUCH AS CHIPPED WINDSHIELDS AND BROKEN HEADLIGHTS DUE TO ROCKS BEING THROWN BY HIGH SPEED ONCOMING OR PASSING TRAFFIC.

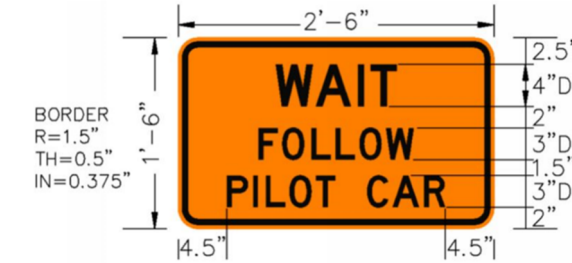
YOU MAY WISH TO CONSIDER TAKING AN ALTERNATE ROUTE. IF YOU PROCEED, KEEP TO THE RIGHT AND DRIVE 40 MPH OR LESS. ANOTHER FLAGGER AND A PILOT CAR WILL BE ESCORTING YOU AROUND THE OIL SEAL COAT APPLICATION AREA.

THANK YOU.

FLAGGING

Operations will be conducted so that the traveling public will not have to wait longer than 15 minutes at the flagger station.

Additional flagger warning signs and flagger hours have been included in the Estimate of Quantities for use on intersecting roads. These flaggers will be used as directed by the Engineer and will be used primarily during daytime hours. Also included in the Estimate of Quantities are WAIT FOLLOW PILOT CAR signs for use on low volume intersecting roads as determined by the Engineer. WAIT FOLLOW PILOT CAR signs will not block the view of the stop sign.



It is required that the flaggers and pilot car operators be able to communicate with one another. If an emergency vehicle needs to pass through the project, the Contractor will be required to expedite traffic movement. All costs associated with this will be incidental to the contract unit price per hour for "Flagging".

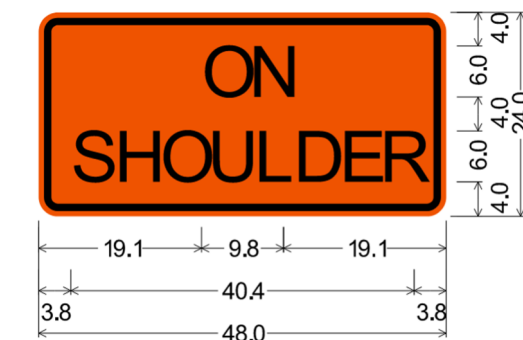
WORK ZONE SPEED REDUCTION

The Department is required to obtain a speed reduction resolution prior to the installation of any SPEED LIMIT (R2-1) signs shown on standard plate 634.63. To provide adequate time for the resolution to be enacted, the Contractor will inform the Engineer a minimum of 3 weeks prior to the scheduled installation of any work zone speed reduction signs on the project. The information provided by the Contractor will include the anticipated date of sign installation, the newly reduced speed limit, the location of the work zone, and the anticipated completion date of work requiring the speed reduction.

TRAFFIC CONTROL SIGNS

Traffic control signs have been included in a table for each route. Payment will only be for those signs used on each route.

SIGN DESIGN



2.3" Radius, 0.9" Border, 0.6" Indent, Black on Orange;

INVENTORY OF TRAFFIC CONTROL DEVICES (I90E, MRM 9.34+ 0.469 to MRM 15+ 0.155)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	2	36"	3.9	7.8
R2-1	SPEED LIMIT	5	36" x 48"	12.0	60.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-2	YIELD AHEAD (symbol)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (MPH)	3	48" x 48"	16.0	48.0
W4-1	MERGE (symbol)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	6	48" x 48"	16.0	96.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT 5 MILES	1	48" x 24"	8.0	8.0
G20-2	END ROAD WORK	5	48" x 24"	8.0	40.0
SPECIAL	ON SHOULDER	2	48" x 24"	8.0	16.0
SPECIAL	EXIT	2	36" x 32"	8.0	16.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT					537.8

INVENTORY OF TRAFFIC CONTROL DEVICES (I90E, MRM 38+ 0.843 to MRM 44.90+ 0.080)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	2	36"	3.9	7.8
R2-1	SPEED LIMIT	5	36" x 48"	12.0	60.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-2	YIELD AHEAD (symbol)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (MPH)	3	48" x 48"	16.0	48.0
W4-1	MERGE (symbol)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	3	48" x 48"	16.0	48.0
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	3	48" x 48"	16.0	48.0
G20-1	ROAD WORK NEXT 8 MILES	1	48" x 24"	8.0	8.0
G20-2	END ROAD WORK	5	48" x 24"	8.0	40.0
SPECIAL	ON SHOULDER	3	48" x 24"	8.0	24.0
SPECIAL	EXIT	2	36" x 32"	8.0	16.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT					561.8

INVENTORY OF TRAFFIC CONTROL DEVICES (I90E, MRM 50+ 0.005 to MRM 56+ 0.330)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	2	36"	3.9	7.8
R2-1	SPEED LIMIT	5	36" x 48"	12.0	60.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-2	YIELD AHEAD (symbol)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (MPH)	3	48" x 48"	16.0	48.0
W4-1	MERGE (symbol)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT 6 MILES	1	48" x 24"	8.0	8.0
G20-2	END ROAD WORK	4	48" x 24"	8.0	32.0
SPECIAL	ON SHOULDER	2	48" x 24"	8.0	16.0
SPECIAL	EXIT	2	36" x 32"	8.0	16.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT					513.8

INVENTORY OF TRAFFIC CONTROL DEVICES (I90W, MRM 9.34+ 0.478 to MRM 15+ 0.155)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	2	36"	3.9	7.8
R2-1	SPEED LIMIT	5	36" x 48"	12.0	60.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-2	YIELD AHEAD (symbol)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (MPH)	3	48" x 48"	16.0	48.0
W4-1	MERGE (symbol)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	3	48" x 48"	16.0	48.0
W20-1	ROAD WORK AHEAD	6	48" x 48"	16.0	96.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	3	48" x 48"	16.0	48.0
G20-1	ROAD WORK NEXT 5 MILES	1	48" x 24"	8.0	8.0
G20-2	END ROAD WORK	5	48" x 24"	8.0	40.0
SPECIAL	ON SHOULDER	3	48" x 24"	8.0	24.0
SPECIAL	EXIT	2	36" x 32"	8.0	16.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT					577.8

INVENTORY OF TRAFFIC CONTROL DEVICES (I90W, MRM 40.20+ 0.123 to MRM 44.86+ 0.055)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	1	36"	3.9	3.9
R2-1	SPEED LIMIT	4	36" x 48"	12.0	48.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-2	YIELD AHEAD (symbol)	1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (MPH)	3	48" x 48"	16.0	48.0
W4-1	MERGE (symbol)	2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT 5 MILES	1	48" x 24"	8.0	8.0
G20-2	END ROAD WORK	4	48" x 24"	8.0	32.0
SPECIAL	ON SHOULDER	2	48" x 24"	8.0	16.0
SPECIAL	EXIT	1	36" x 32"	8.0	8.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT					425.9

INVENTORY OF TRAFFIC CONTROL DEVICES (I90W, MRM 50+ 0.004 to MRM 56+ 0.609)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	2	36"	3.9	7.8
R2-1	SPEED LIMIT	5	36" x 48"	12.0	60.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-2	YIELD AHEAD (symbol)	2	48" x 48"	16.0	32.0
W3-5	SPEED REDUCTION AHEAD (MPH)	3	48" x 48"	16.0	48.0
W4-1	MERGE (symbol)	4	48" x 48"	16.0	64.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	3	48" x 48"	16.0	48.0
W20-1	ROAD WORK AHEAD	5	48" x 48"	16.0	80.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	3	48" x 48"	16.0	48.0
G20-1	ROAD WORK NEXT 6 MILES	1	48" x 24"	8.0	8.0
G20-2	END ROAD WORK	5	48" x 24"	8.0	40.0
SPECIAL	ON SHOULDER	3	48" x 24"	8.0	24.0
SPECIAL	EXIT	2	36" x 32"	8.0	16.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT					561.8

INVENTORY OF TRAFFIC CONTROL DEVICES (SD34, MRM 35.82+ 0.012 to MRM 38.83+ 0.026)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-6	TRUCK CROSSING	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	4	48" x 48"	16.0	64.0
W9-3	CENTER LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W13-1P	ADVISORY SPEED (plaque)	4	30" x 30"	6.3	25.2
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-2	FRESH OIL	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT 3 MILES	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
SPECIAL	WAIT FOLLOW PILOT CAR	4	30" x 18"	3.8	15.2
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					346.4

INVENTORY OF TRAFFIC CONTROL DEVICES (I90E, MRM 61+ 0.201 to MRM 62.15+ 0.373)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	1	36"	3.9	3.9
R2-1	SPEED LIMIT	4	36" x 48"	12.0	48.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-2	YIELD AHEAD (symbol)	1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (MPH)	3	48" x 48"	16.0	48.0
W4-1	MERGE (symbol)	2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT 1 MILES	1	48" x 24"	8.0	8.0
G20-2	END ROAD WORK	4	48" x 24"	8.0	32.0
SPECIAL	ON SHOULDER	2	48" x 24"	8.0	16.0
SPECIAL	EXIT	1	36" x 32"	8.0	8.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS					425.9
SQFT					

INVENTORY OF TRAFFIC CONTROL DEVICES (I90W, MRM 61+ 0.185 to MRM 62.13+ 0.377)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	1	36"	3.9	3.9
R2-1	SPEED LIMIT	4	36" x 48"	12.0	48.0
R2-6aP	FINES DOUBLE (plaque)	1	36" x 24"	6.0	6.0
W3-2	YIELD AHEAD (symbol)	1	48" x 48"	16.0	16.0
W3-5	SPEED REDUCTION AHEAD (MPH)	3	48" x 48"	16.0	48.0
W4-1	MERGE (symbol)	2	48" x 48"	16.0	32.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	2	48" x 48"	16.0	32.0
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT 1 MILES	1	48" x 24"	8.0	8.0
G20-2	END ROAD WORK	4	48" x 24"	8.0	32.0
SPECIAL	ON SHOULDER	2	48" x 24"	8.0	16.0
SPECIAL	EXIT	1	36" x 32"	8.0	8.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS					425.9
SQFT					

INVENTORY OF TRAFFIC CONTROL DEVICES (I90E, MRM 111.25+ 0.419 to MRM 132+ 0.168)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-2	YIELD	4	36"	3.9	15.6
R2-1	SPEED LIMIT	8	36" x 48"	12.0	96.0
R2-6aP	FINES DOUBLE (plaque)	2	36" x 24"	6.0	12.0
W3-2	YIELD AHEAD (symbol)	4	48" x 48"	16.0	64.0
W3-5	SPEED REDUCTION AHEAD (MPH)	6	48" x 48"	16.0	96.0
W4-1	MERGE (symbol)	8	48" x 48"	16.0	128.0
W4-2	LEFT or RIGHT LANE ENDS (symbol)	4	48" x 48"	16.0	64.0
W8-7	LOOSE GRAVEL	8	48" x 48"	16.0	128.0
W20-1	ROAD WORK AHEAD	6	48" x 48"	16.0	96.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	8	48" x 48"	16.0	128.0
G20-1	ROAD WORK NEXT 20 MILES	2	48" x 24"	8.0	16.0
G20-2	END ROAD WORK	6	48" x 24"	8.0	48.0
SPECIAL	ON SHOULDER	8	48" x 24"	8.0	64.0
SPECIAL	EXIT	4	36" x 32"	8.0	32.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS					1035.6
SQFT					

INVENTORY OF TRAFFIC CONTROL DEVICES (US14, MRM 113.74+ 0.036 to MRM 128.88+ 0.021)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	2	48" x 48"	16.0	32.0
W8-6	TRUCK CROSSING	2	48" x 48"	16.0	32.0
W8-7	LOOSE GRAVEL	8	48" x 48"	16.0	128.0
W13-1P	ADVISORY SPEED (plaque)	8	30" x 30"	6.3	50.4
W20-1	ROAD WORK AHEAD	4	48" x 48"	16.0	64.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	4	48" x 48"	16.0	64.0
W21-2	FRESH OIL	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT 14 MILES	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	4	36" x 18"	4.5	18.0
SPECIAL	WAIT FOLLOW PILOT CAR	4	30" x 18"	3.8	15.2
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS					476.6
SQFT					

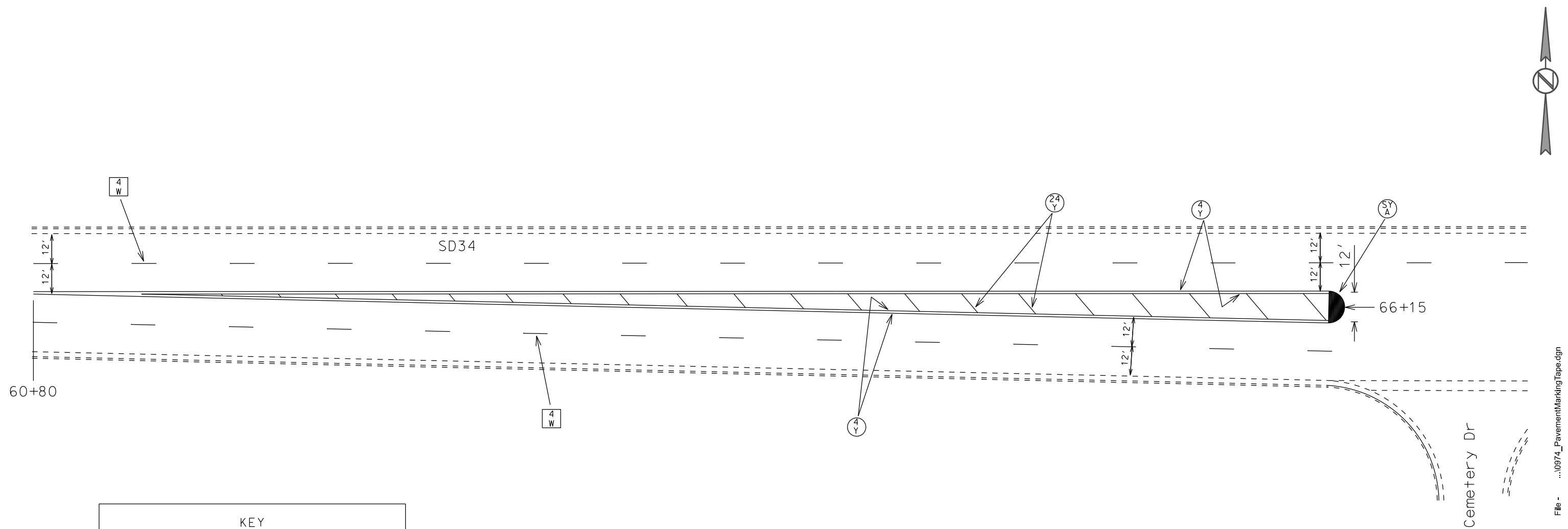
INVENTORY OF TRAFFIC CONTROL DEVICES (I90 E2, MRM 111.73 to MRM 112.54)

SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W5-4	RAMP NARROWS	1	48" x 48"	16.0	16.0
W8-6	TRUCK CROSSING	1	48" x 48"	16.0	16.0
W8-7	LOOSE GRAVEL	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque)	1	30" x 30"	6.3	6.3
W13-4P	ON RAMP (plaque)	1	36" x 36"	9.0	9.0
W20-1	ROAD WORK AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-2	FRESH OIL	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	48" x 24"	8.0	8.0
SPECIAL	EXIT	1	36" x 32"	8.0	8.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS					127.3
SQFT					

INVENTORY OF TRAFFIC CONTROL DEVICES (I90 W1, MRM 112.87 to MRM 113.29)

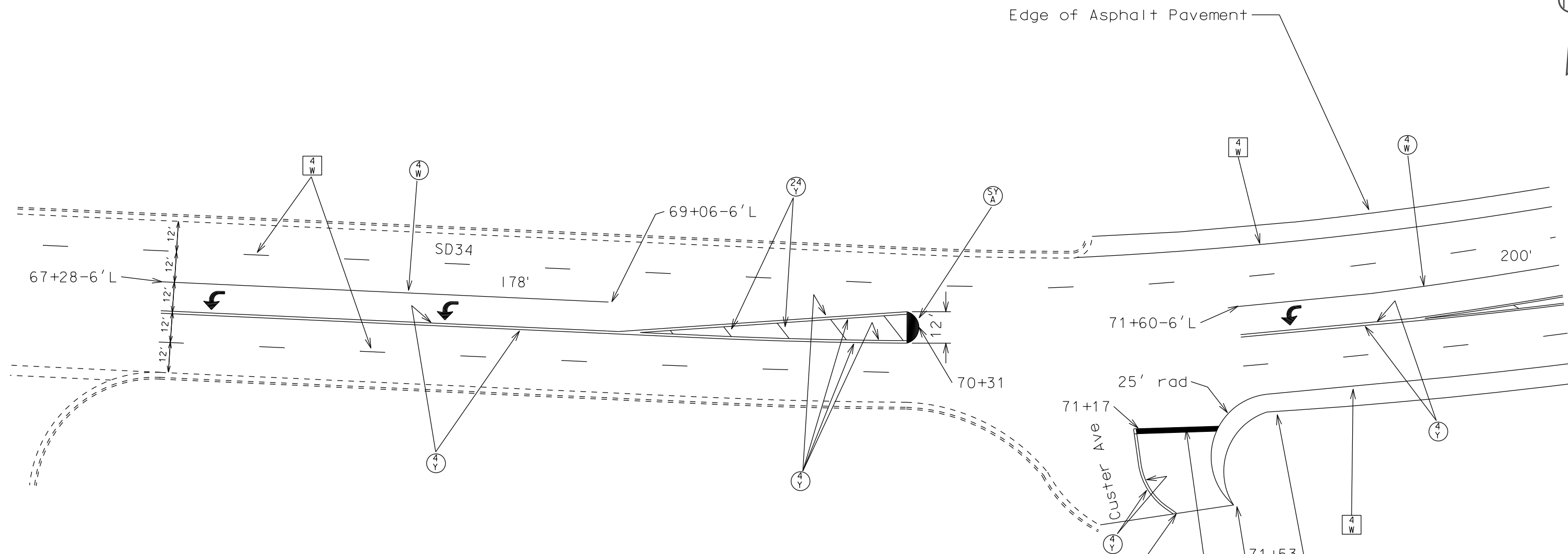
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W5-4	RAMP NARROWS	1	48" x 48"	16.0	16.0
W8-6	TRUCK CROSSING	1	48" x 48"	16.0	16.0
W8-7	LOOSE GRAVEL	1	48" x 48"	16.0	16.0
W13-1P	ADVISORY SPEED (plaque)	1	30" x 30"	6.3	6.3
W13-4P	ON RAMP (plaque)	1	36" x 36"	9.0	9.0
W20-1	ROAD WORK AHEAD	1	48" x 48"	16.0	16.0
W20-7	FLAGGER (symbol)	1	48" x 48"	16.0	16.0
W21-2	FRESH OIL	1	48" x 48"	16.0	16.0
G20-2	END ROAD WORK	1	48" x 24"	8.0	8.0
SPECIAL	EXIT	1	36" x 32"	8.0	8.0
EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS					127.3
SQFT					

SD34 EXISTING PAVEMENT MARKING



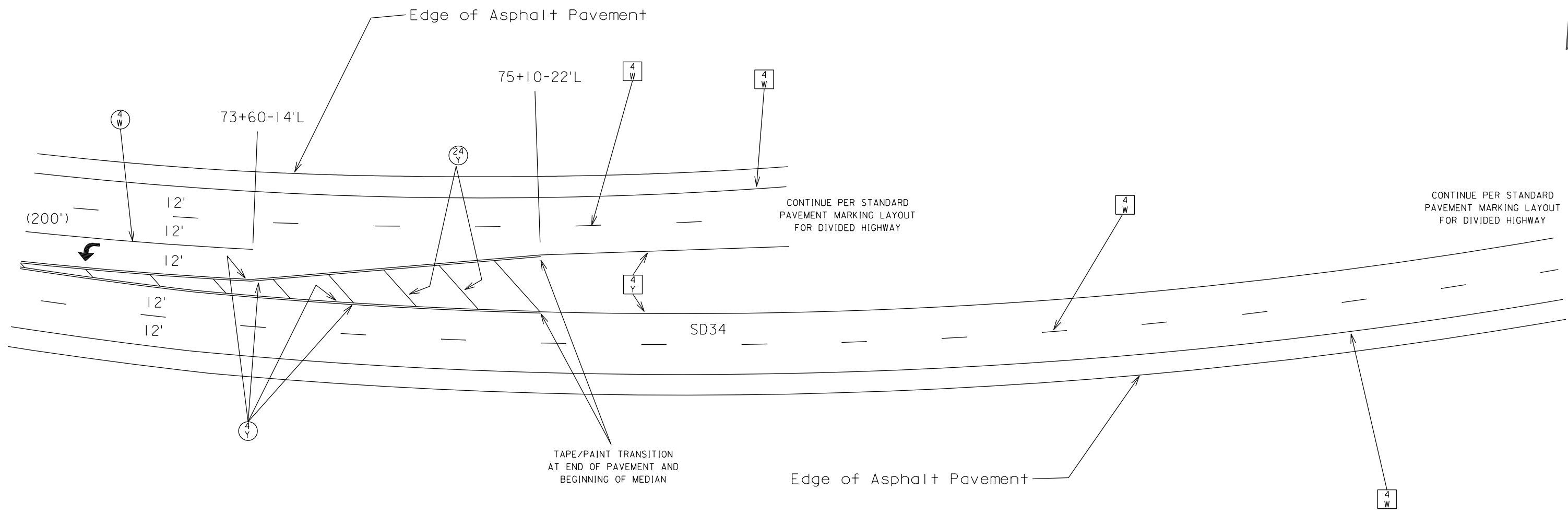
KEY	
SYM	DESCRIPTION
	4" WHITE PAINT
	4" WHITE TAPE (GROOVED IN)
	4" YELLOW TAPE (GROOVED IN)
	24" YELLOW TAPE (GROOVED IN)
	SOLID YELLOW AREA (GROOVED IN)

SD34 EXISTING PAVEMENT MARKING



KEY	
SYM	DESCRIPTION
	4" WHITE PAINT
	4" WHITE TAPE (GROOVED IN)
	4" YELLOW TAPE (GROOVED IN)
	24" WHITE TAPE (GROOVED IN)
	24" YELLOW TAPE (GROOVED IN)
	SOLID YELLOW AREA (GROOVED IN)
	ARROW TAPE (GROOVED IN)

SD34 EXISTING PAVEMENT MARKING

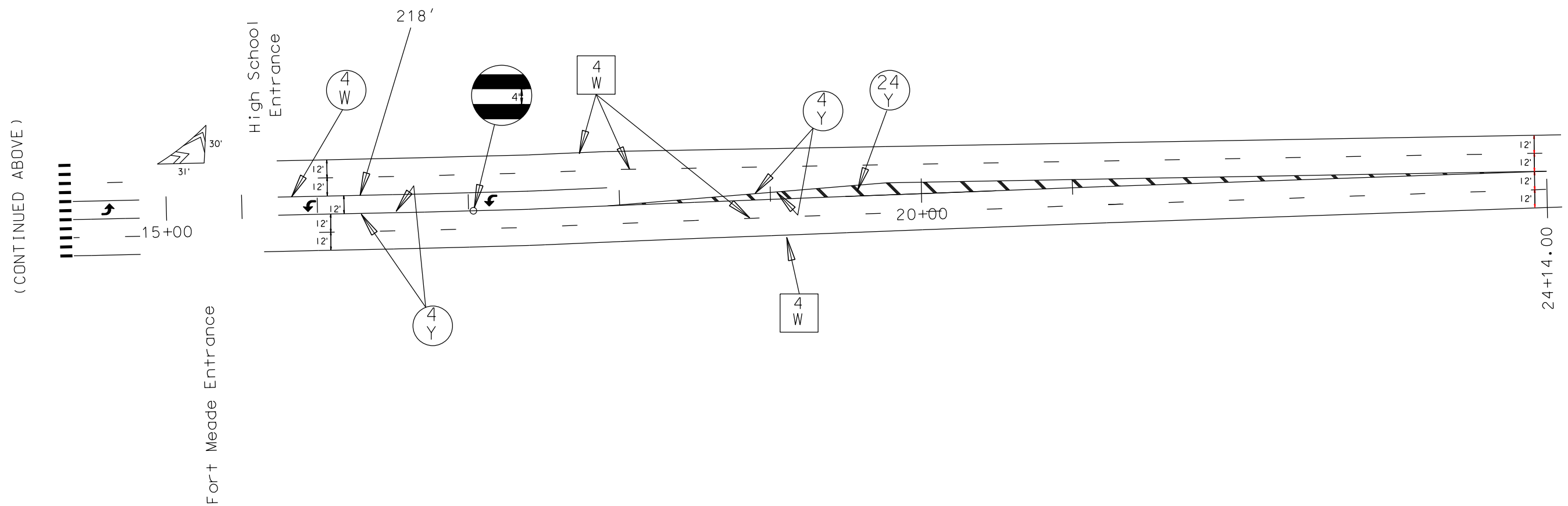
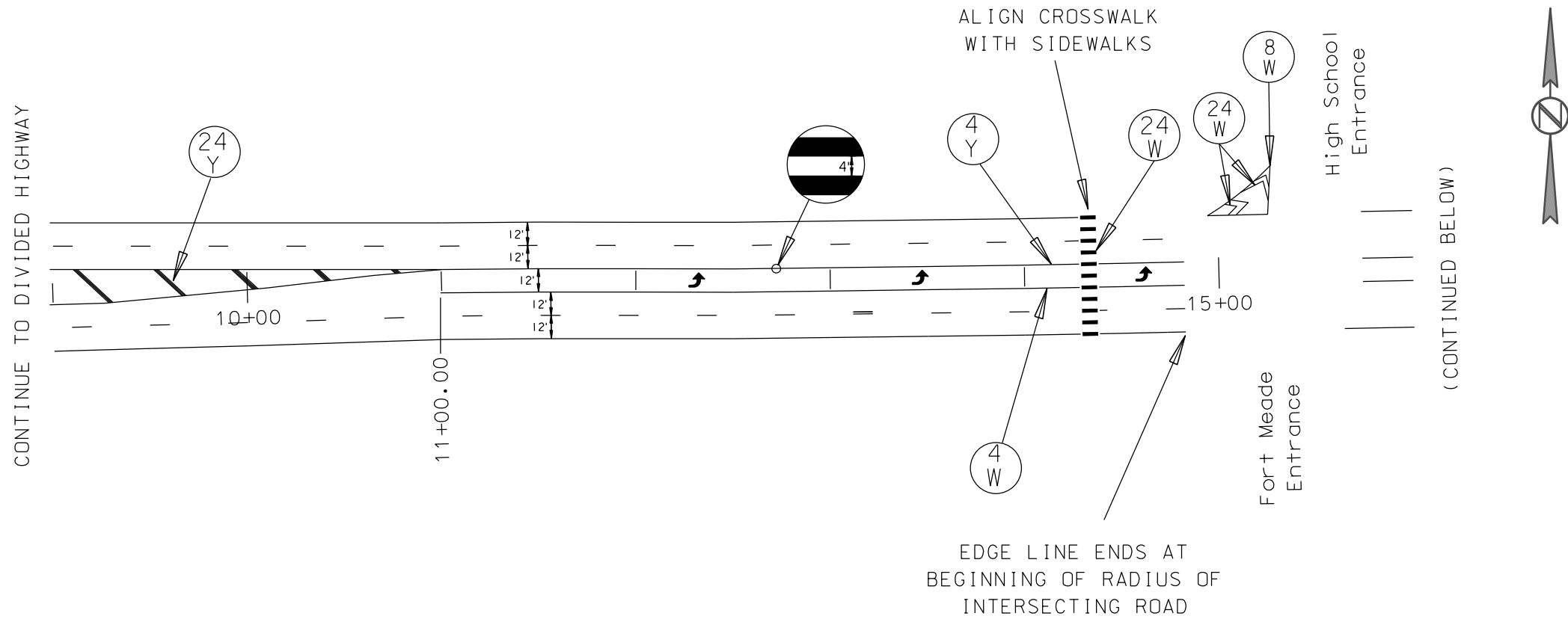


KEY	
SYM	DESCRIPTION
	4" WHITE PAINT
	4" WHITE TAPE (GROOVED IN)
	4" YELLOW PAINT
	4" YELLOW TAPE (GROOVED IN)
	24" YELLOW TAPE (GROOVED IN)
	ARROW TAPE (GROOVED IN)

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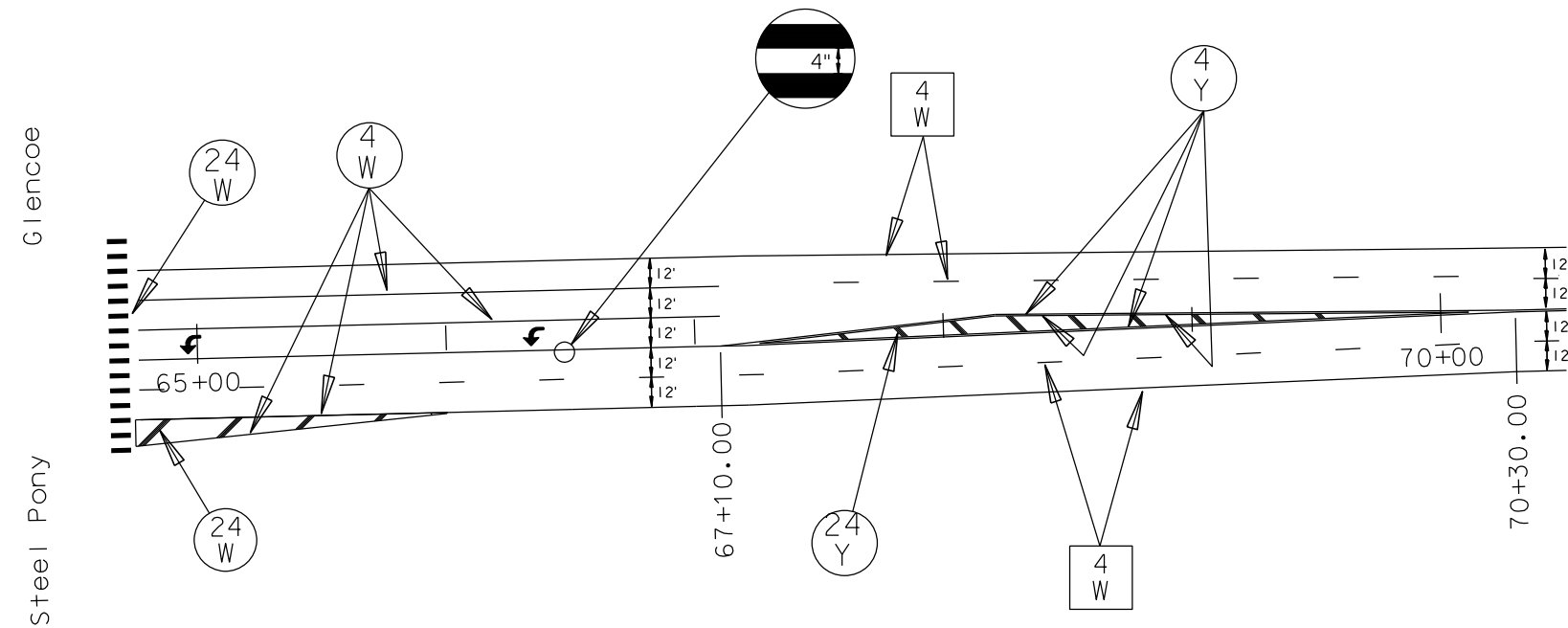
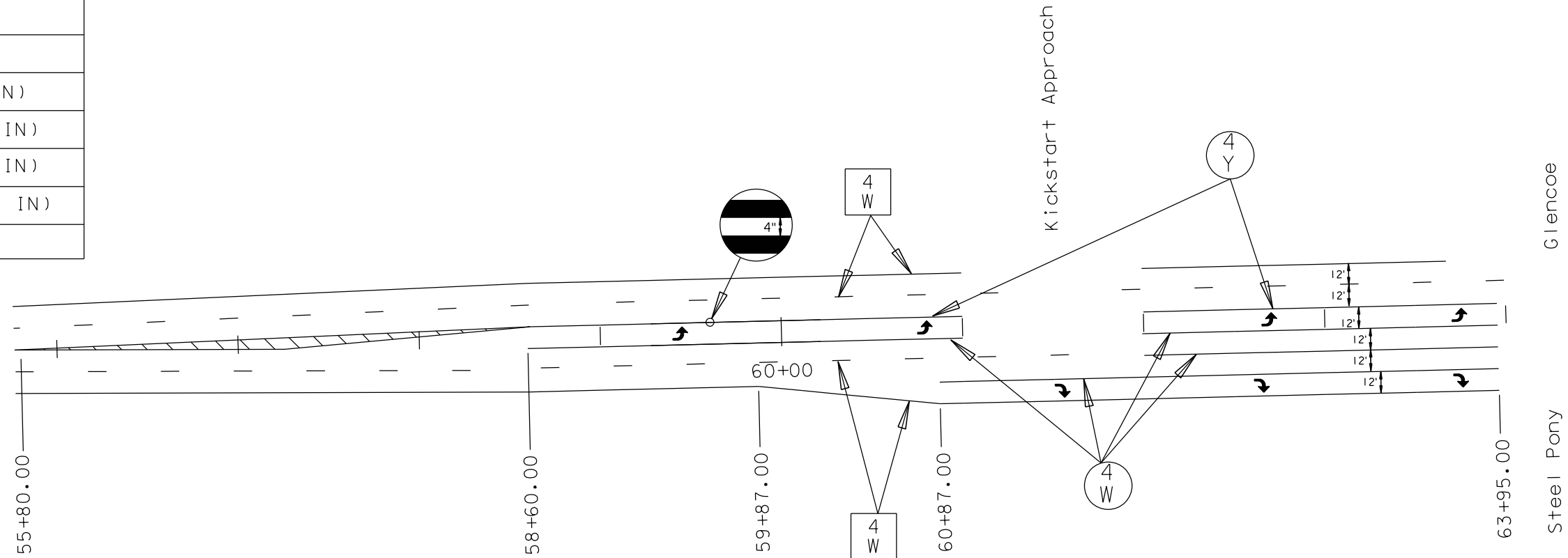
SD34 EXISTING PAVEMENT MARKING

KEY	
SYM	DESCRIPTION
4 W	4" WHITE PAINT
4 W	4" WHITE TAPE (GROOVED IN)
8 W	8" WHITE TAPE (GROOVED IN)
4 Y	4" YELLOW TAPE (GROOVED IN)
24 W	24" WHITE TAPE (GROOVED IN)
24 Y	24" YELLOW TAPE (GROOVED IN)
↷	ARROW TAPE (GROOVED IN)

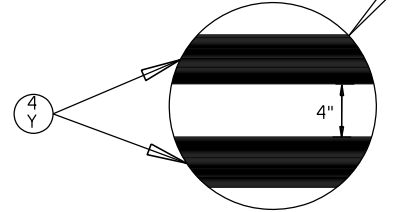
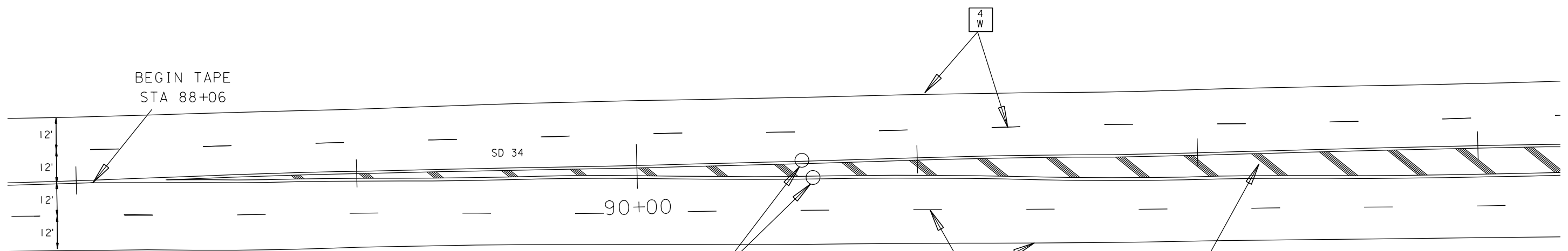


SD34 EXISTING PAVEMENT MARKING

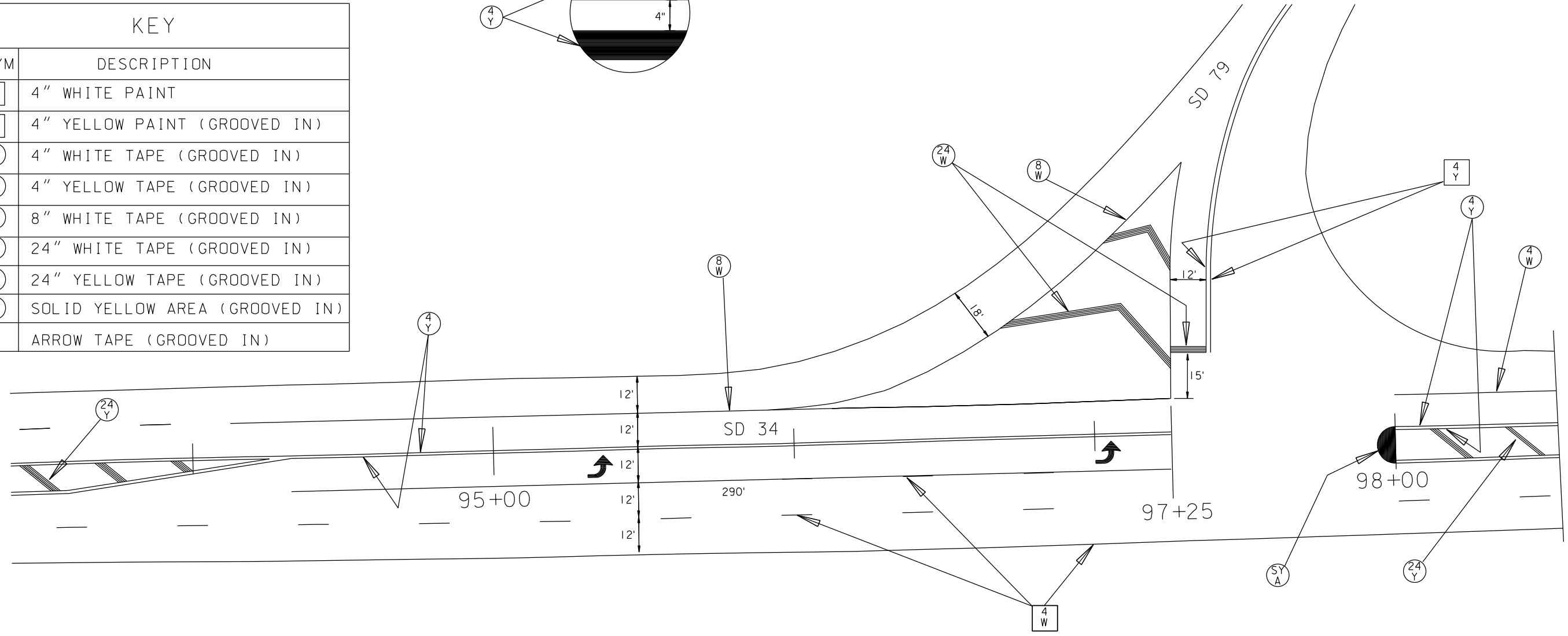
KEY	
SYM	DESCRIPTION
4 W	4" WHITE PAINT
4 W	4" WHITE TAPE (GROOVED IN)
4 Y	4" YELLOW TAPE (GROOVED IN)
24 W	24" WHITE TAPE (GROOVED IN)
24 Y	24" YELLOW TAPE (GROOVED IN)
↷	ARROW TAPE (GROOVED IN)



SD34 EXISTING PAVEMENT MARKING



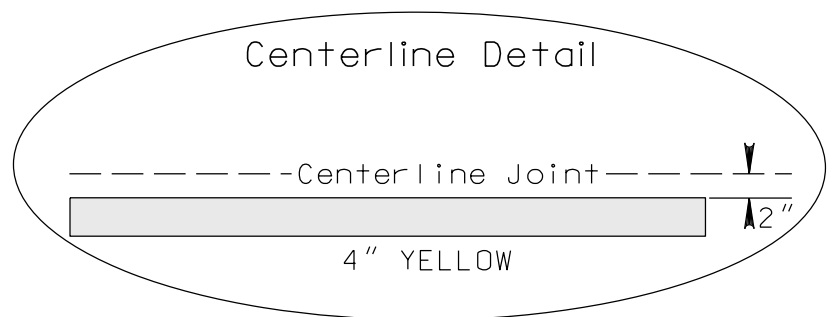
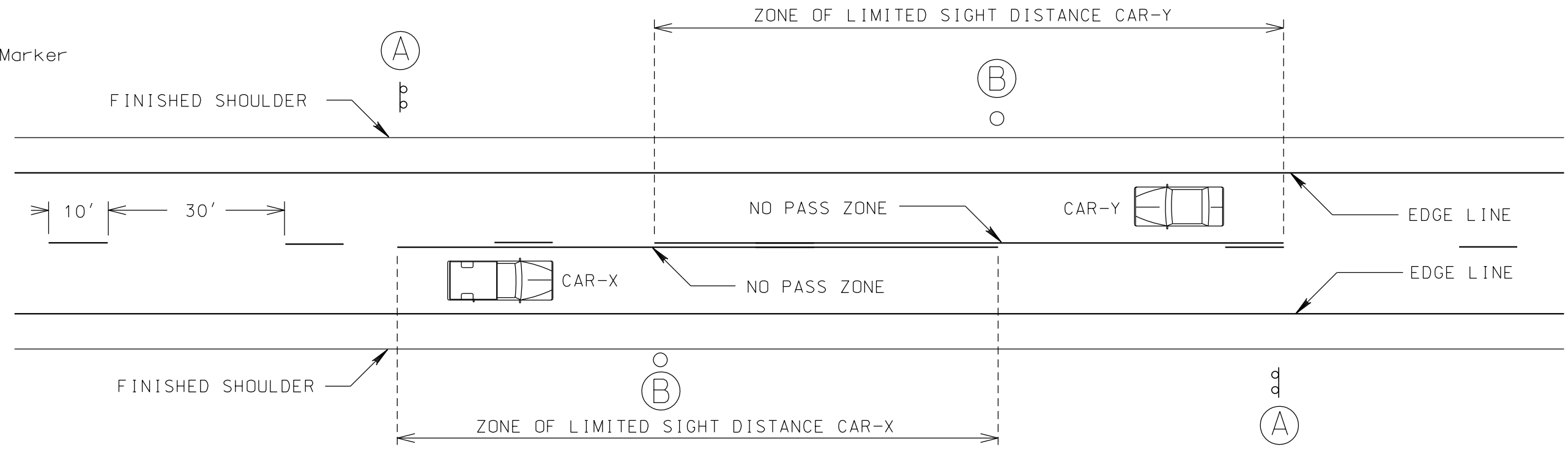
KEY	
SYM	DESCRIPTION
4 W	4" WHITE PAINT
4 Y	4" YELLOW PAINT (GROOVED IN)
4 W	4" WHITE TAPE (GROOVED IN)
4 Y	4" YELLOW TAPE (GROOVED IN)
8 W	8" WHITE TAPE (GROOVED IN)
24 W	24" WHITE TAPE (GROOVED IN)
24 Y	24" YELLOW TAPE (GROOVED IN)
SY A	SOLID YELLOW AREA (GROOVED IN)
↷	ARROW TAPE (GROOVED IN)



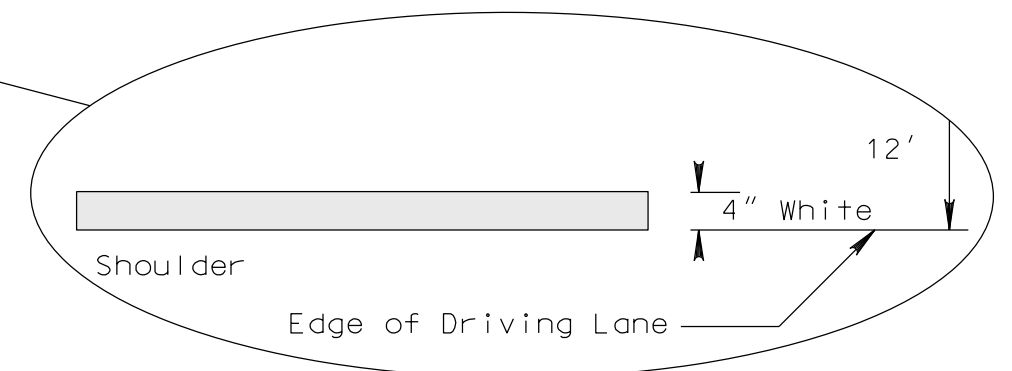
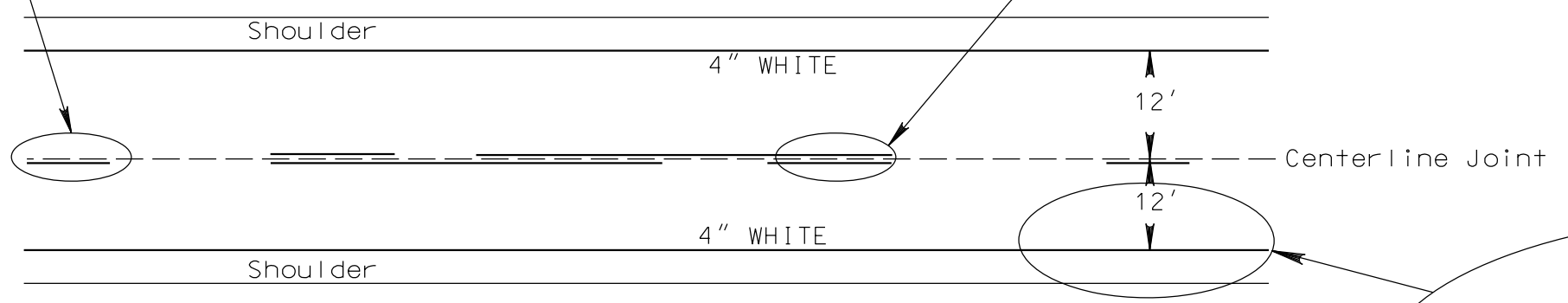
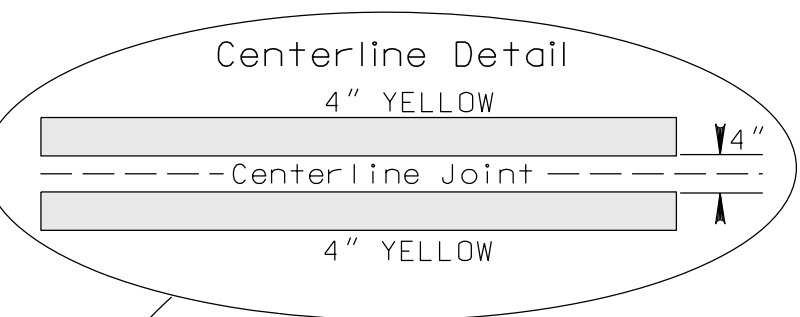
TYPICAL PAVEMENT MARKING LAYOUT



(A) NO PASSING ZONE
(B) End of Zone Marker

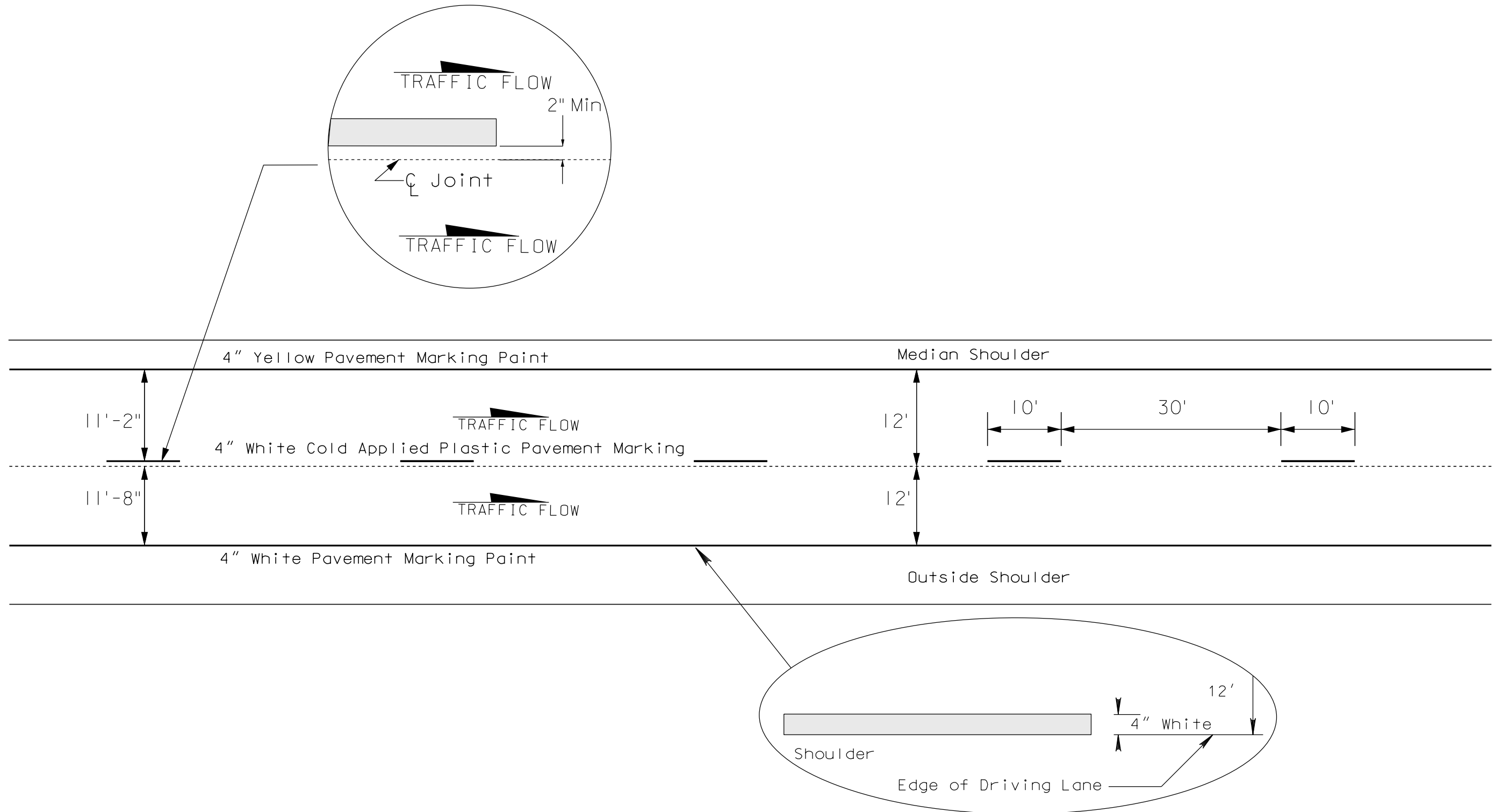


NOTE: A TWO "GUN" SYSTEM WILL BE USED TO OBTAIN THIS PATTERN.
 WHEN A SINGLE SKIP LINE EXISTS, THE SKIP WILL BE PLACED TO THE SOUTH OR EAST OF THE CENTERLINE JOINT.



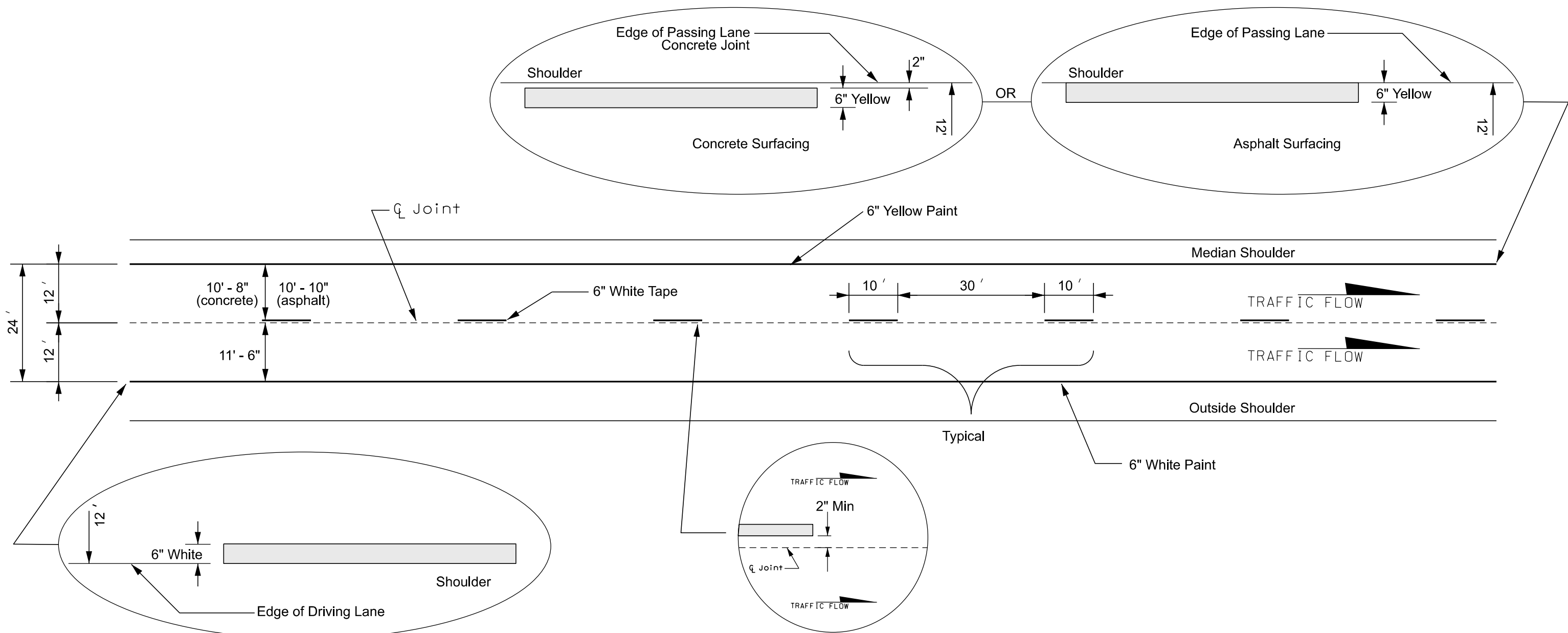
TYPICAL PAVEMENT MARKING LAYOUT

4 LANE DIVIDED HIGHWAY (4" Marking)



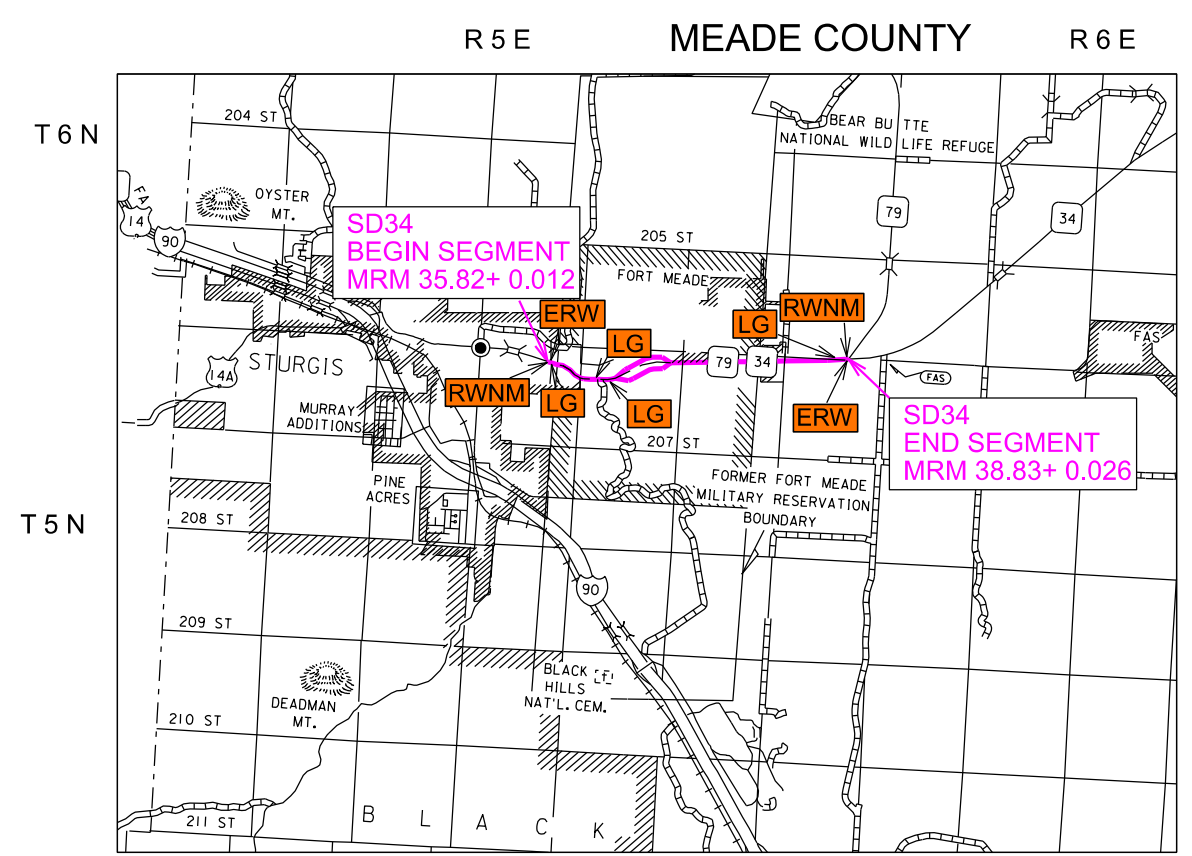
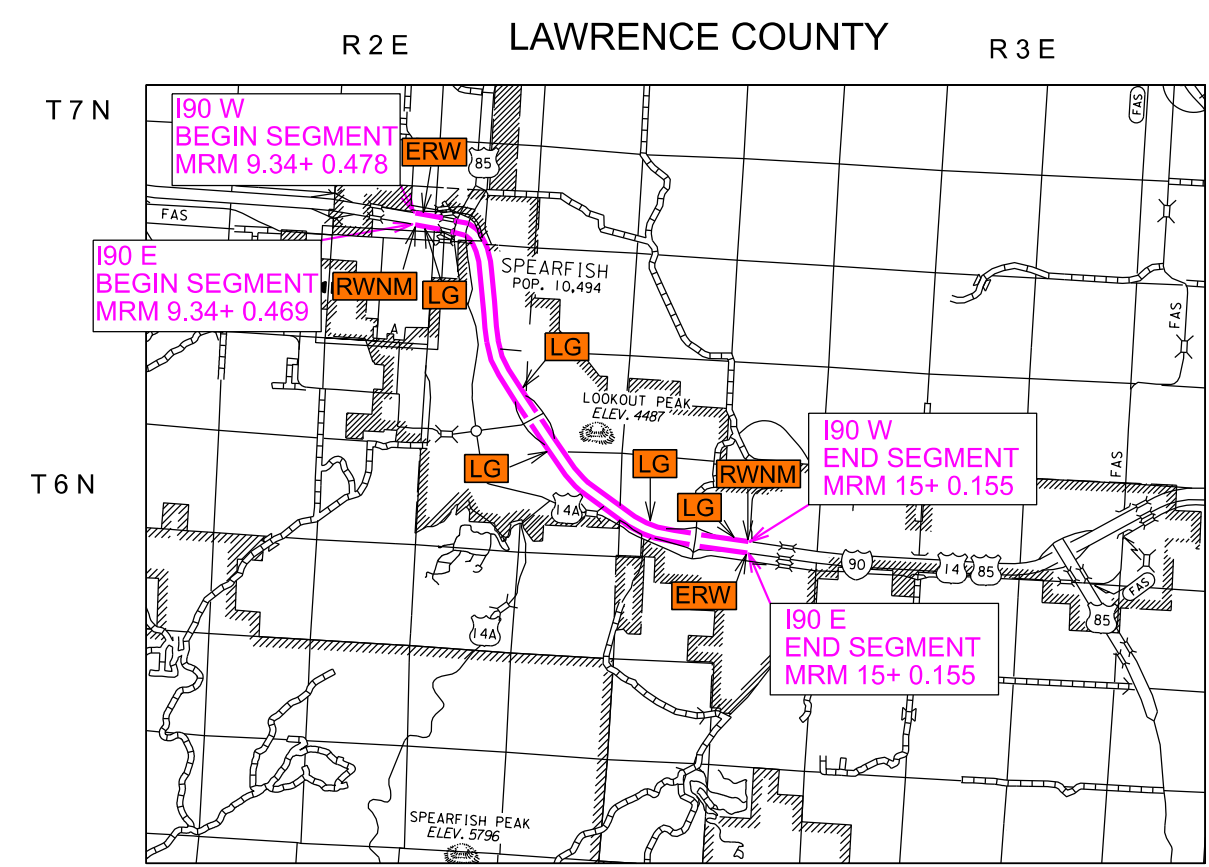
TYPICAL PAVEMENT MARKING LAYOUT

4 LANE DIVIDED HIGHWAY (6" Marking)



FIXED LOCATION SIGNS

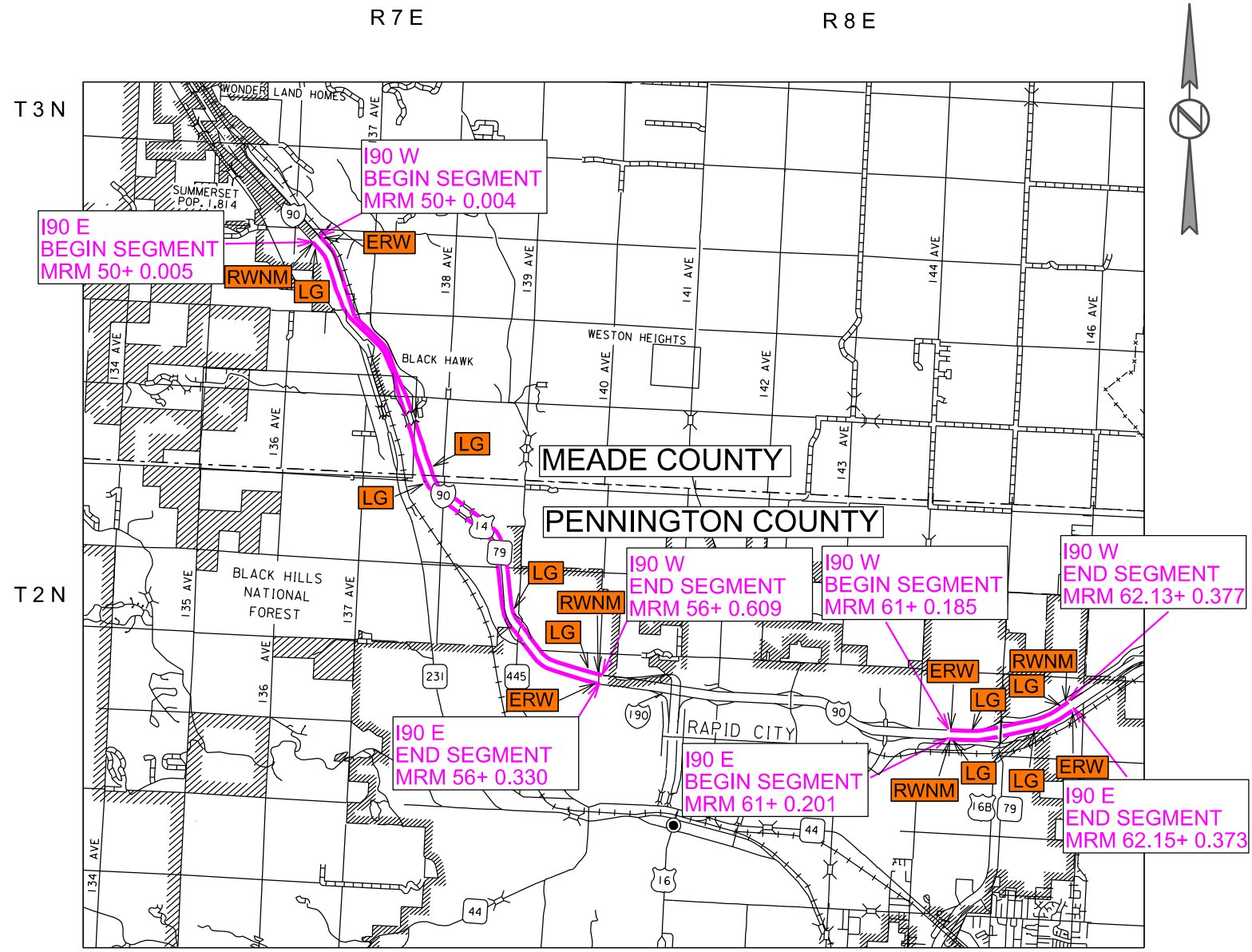
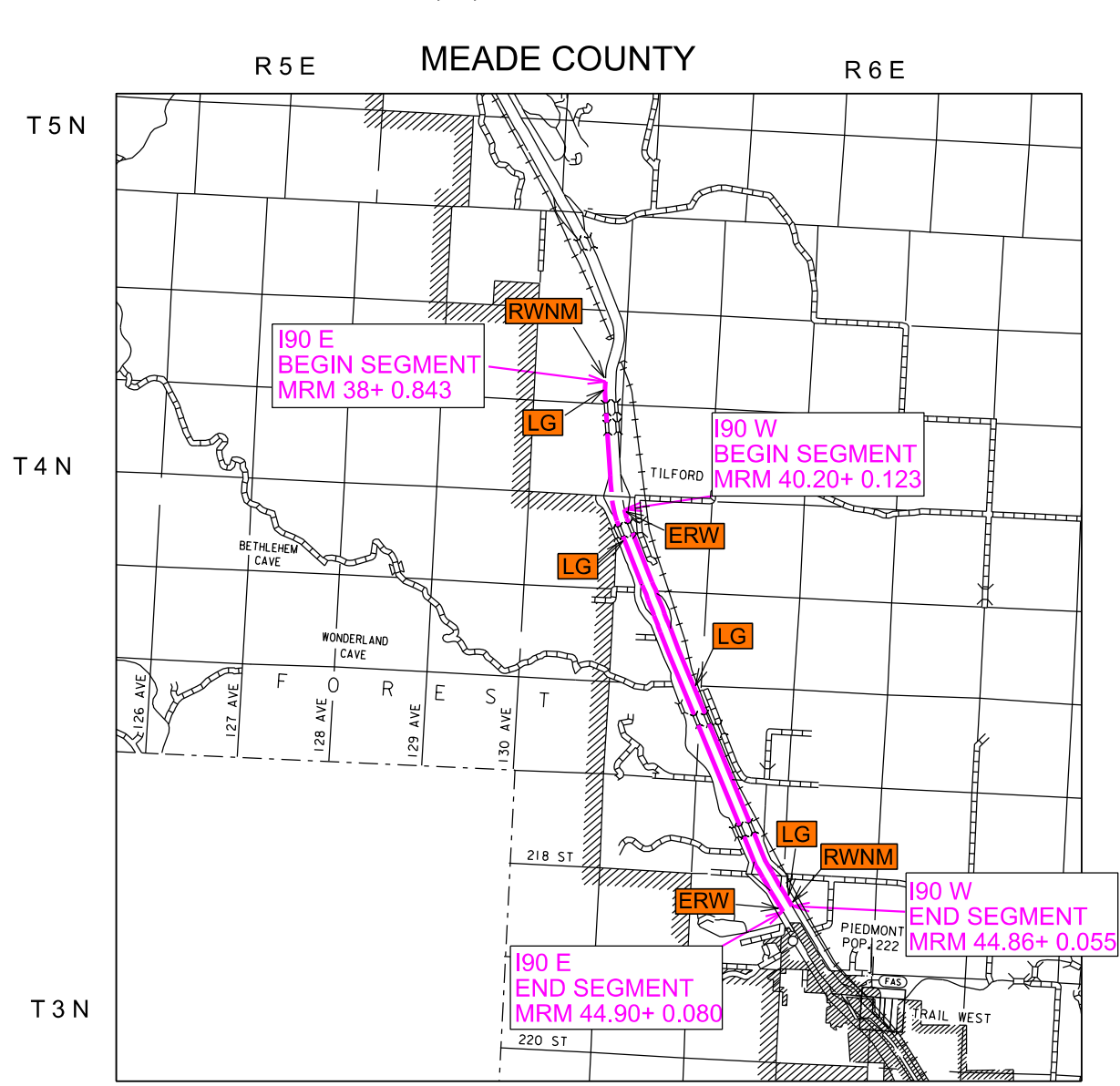
- RWNM ROAD WORK NEXT XX MILES
- ERW END ROAD WORK
- LG LOOSE GRAVEL with ADVISORY SPEED or ON SHOULDER plaques



- RWNM** ROAD WORK NEXT XX MILES
- ERW** END ROAD WORK
- LG** LOOSE GRAVEL with ON SHOULDER plaques

FIXED LOCATION SIGNS

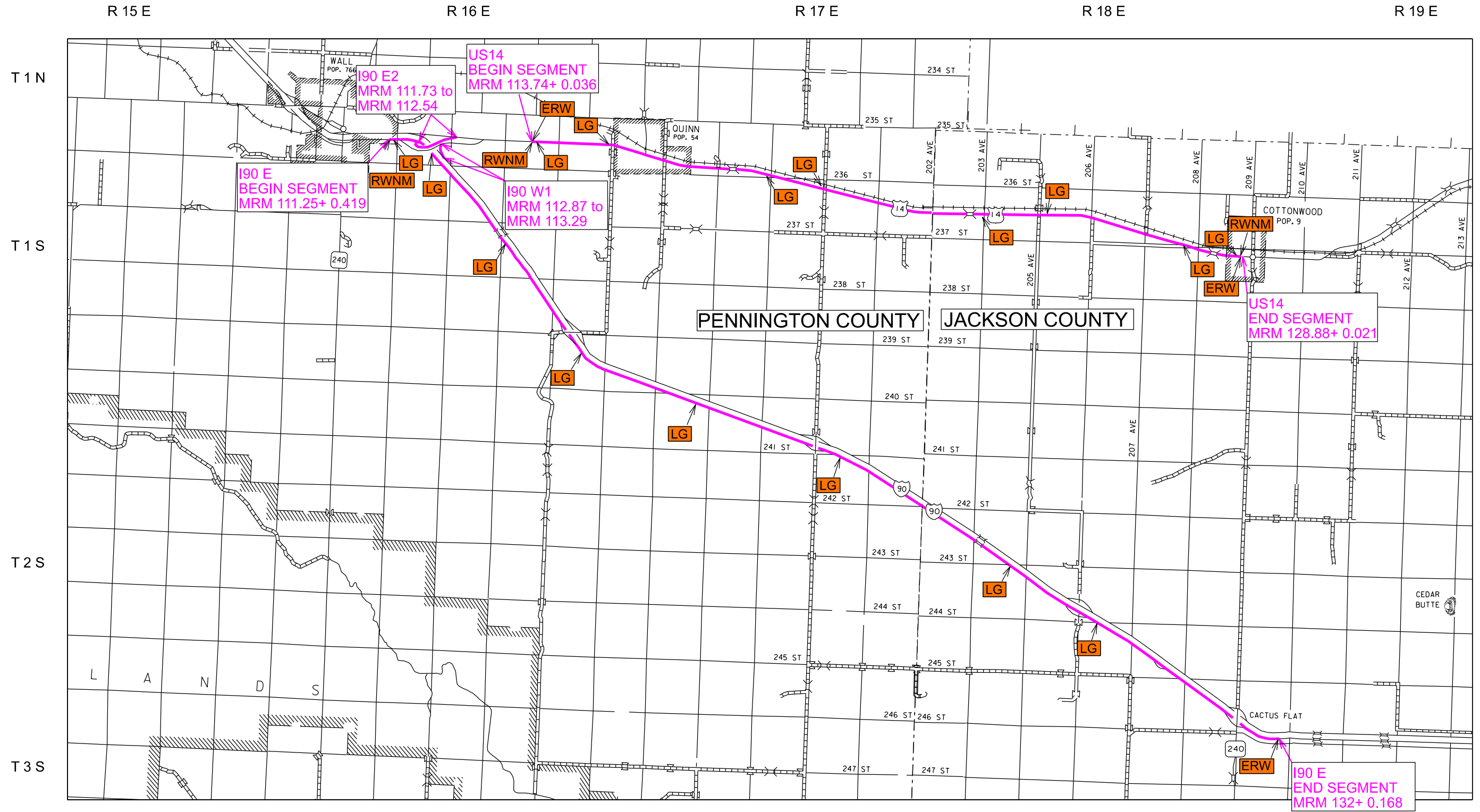
SD DOT	PROJECT	SECTION	SHEET
	IM-NH 0041(181)	non	25/36
Plotting Date: 12/08/2023			



- RWNM ROAD WORK NEXT XX MILES
- ERW END ROAD WORK
- LG LOOSE GRAVEL with ADVISORY SPEED or ON SHOULDER plaques

FIXED LOCATION SIGNS

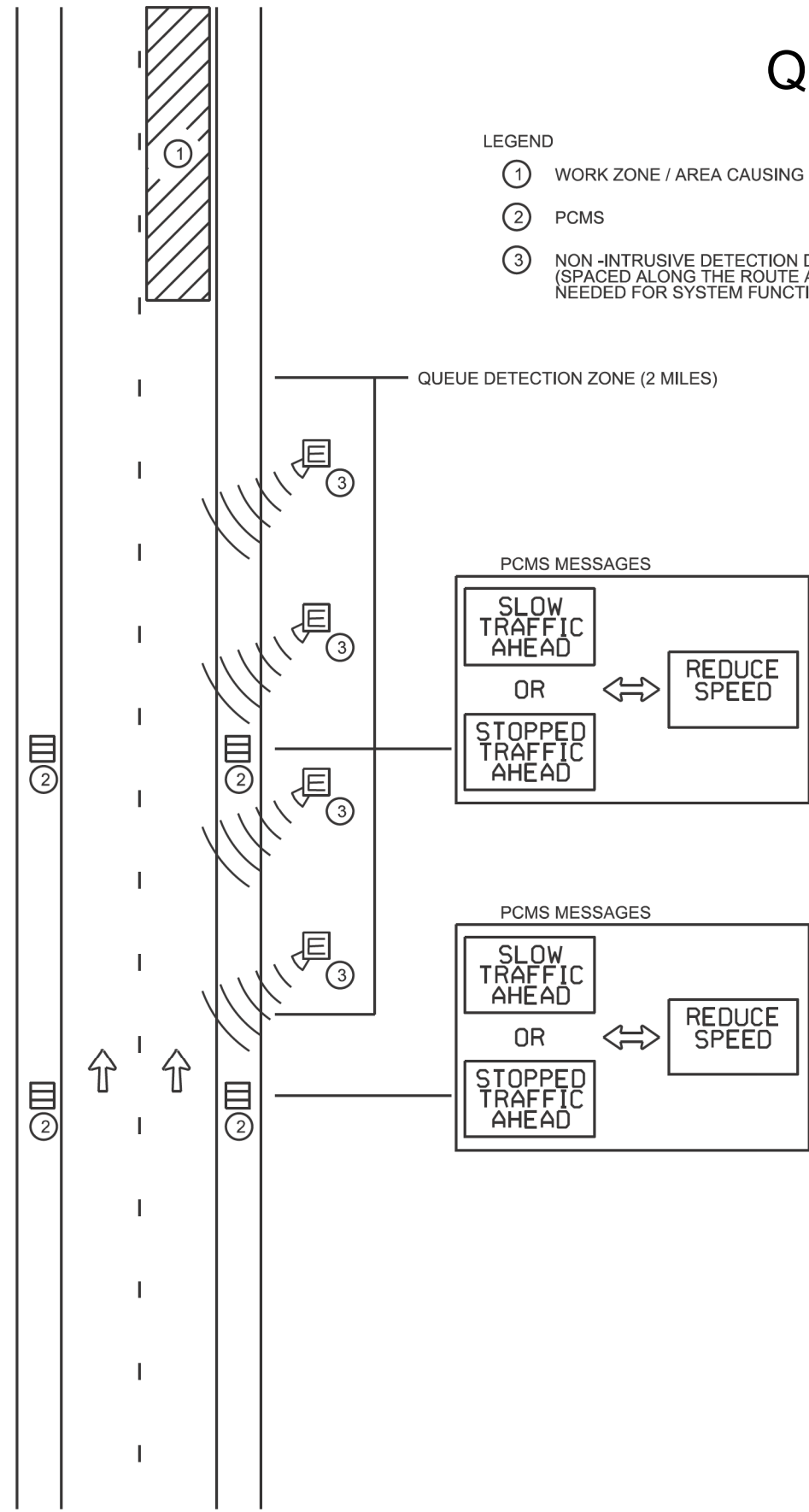
	PROJECT	SECTION	SHEET
	IM-NH 0041(181)	non	26/36
Plotting Date: 12/08/2023			



NOT TO SCALE

QUEUE DETECTION SYSTEM

- LEGEND
- ① WORK ZONE / AREA CAUSING DELAY.
 - ② PCMS
 - ③ NON-INTRUSIVE DETECTION DEVICE (SPACED ALONG THE ROUTE AS NEEDED FOR SYSTEM FUNCTION PROPERLY)



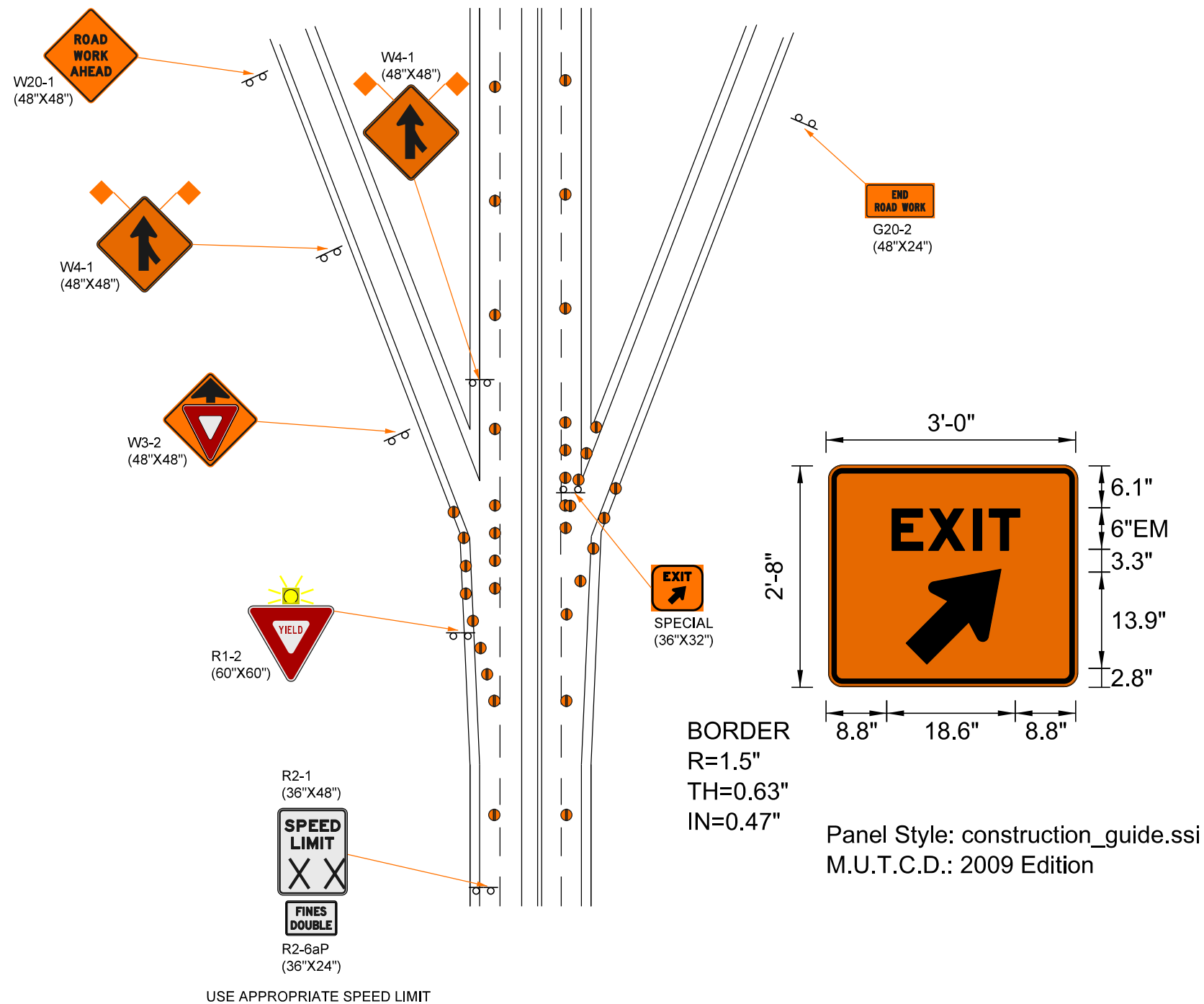
NOTES:

1. THE LAYOUT ONLY SHOWS THE ADDITIONAL SIGNAGE REQUIRED TO SETUP A STOPPED OR SLOW TRAFFIC AHEAD SYSTEM. REFER TO OTHER TEMPORARY TRAFFIC CONTROL LAYOUTS FOR THE PROPER TEMPORARY TRAFFIC CONTROL DEVICES.
2. LOCATIONS OF THE PCMS ARE DEPENDENT OF THE SITE, TRAFFIC, AND OPERATIONAL CONDITIONS. LOCATIONS OF THE PCMS WILL BE APPROVED BY THE ENGINEER. PCMS ARE ACTIVATED IN RESPONSE TO QUEUED TRAFFIC WHEN THE QUEUE IS DETECTED BETWEEN THE PCMS.
3. THE PCMS WILL ACTIVATE AND DEACTIVATE WHEN THE DOWNSTREAM DETECTOR SENSES TRAFFIC SPEEDS MEETING THRESHOLD VALUES AS SET BY THE ENGINEER. TO DEACTIVATE THE PCMS THE AVERAGE SPEED TYPICALLY SHOULD RECOVER TO WITHIN 10 MPH OF THE POSTED SPEED LIMIT OR HIGHER.

QUEUE DETECTION SYSTEM
MULTI-LANE DIVIDED ROAD

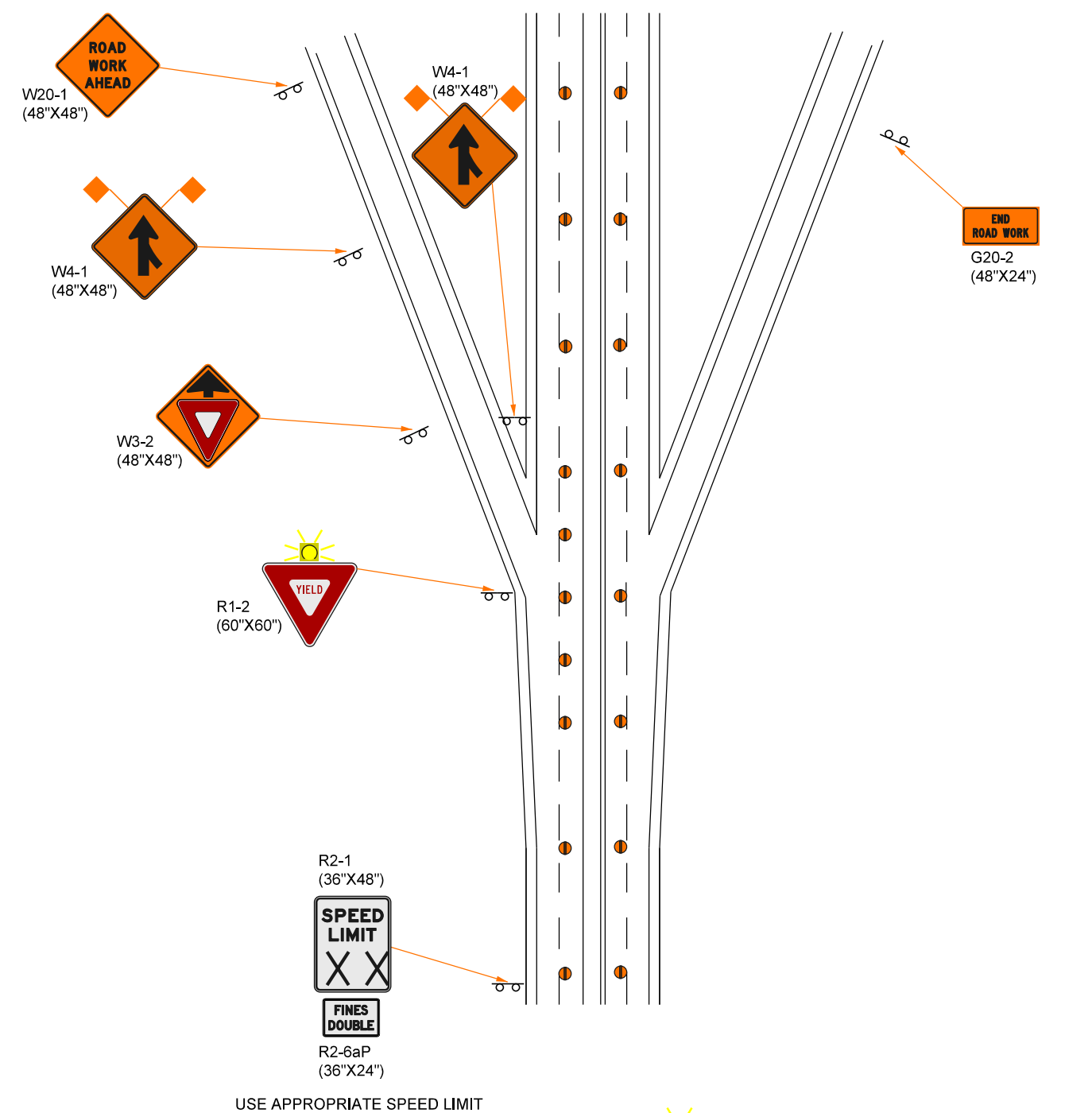
TRAFFIC CONTROL

RAMP ENTRANCE AND EXIT DRIVING LANE CLOSED



TRAFFIC CONTROL

RAMP ENTRANCE AND EXIT PASSING LANE CLOSED



* Messages on signs will vary depending on the operation being conducted.

Vehicle-mounted signs will be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs will be covered or turned from view when work is not in progress.

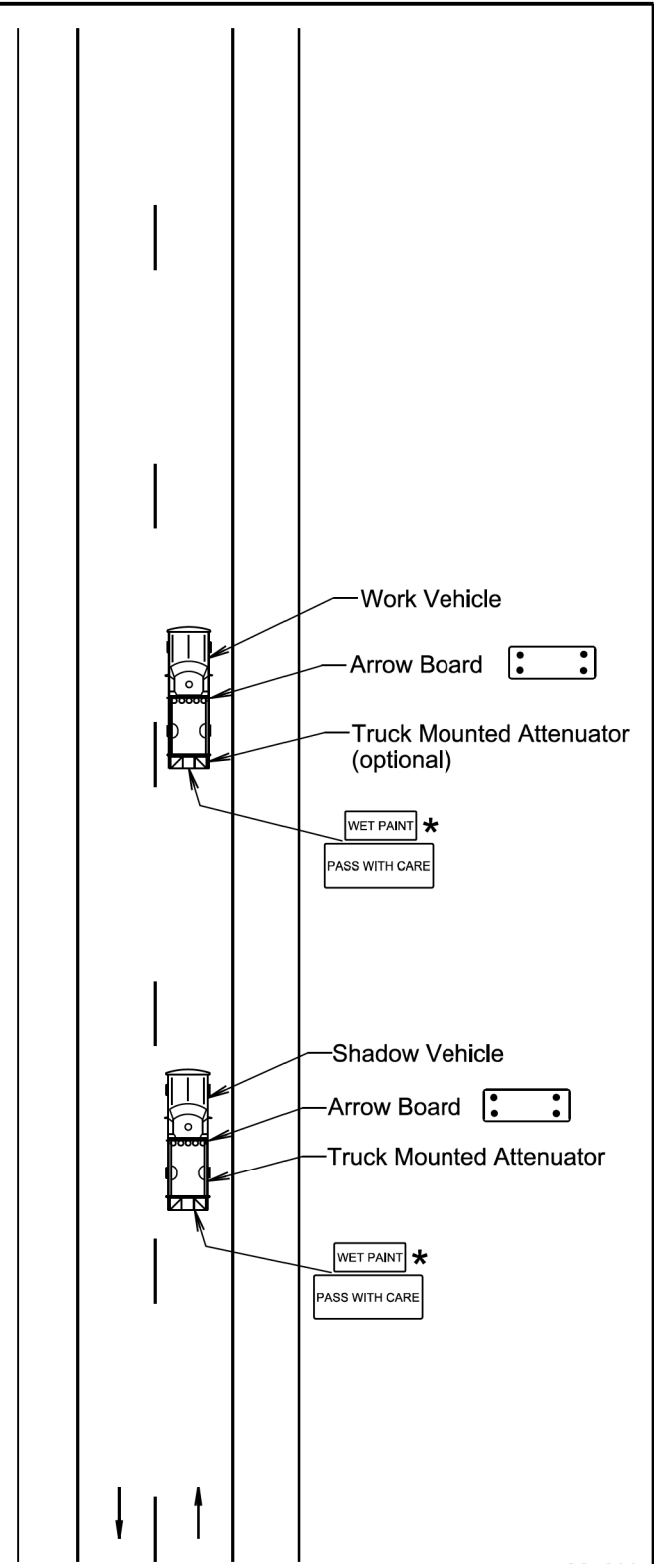
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

Vehicle hazard warning signals will not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

When an arrow board is used, it will be used in the caution mode. Marching Diamonds are acceptable.

Arrow boards will, as a minimum, be Type B, with a size of 60" x 30".

All costs associated with the traffic control for mobile operation including signs, arrow boards and equipment will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".



January 22, 2021

Published Date: 2024	SD DOT	MOBILE OPERATIONS ON 2-LANE ROAD	PLATE NUMBER 634.06
			Sheet 1 of 1

* Messages on signs will vary depending on the operation being conducted.

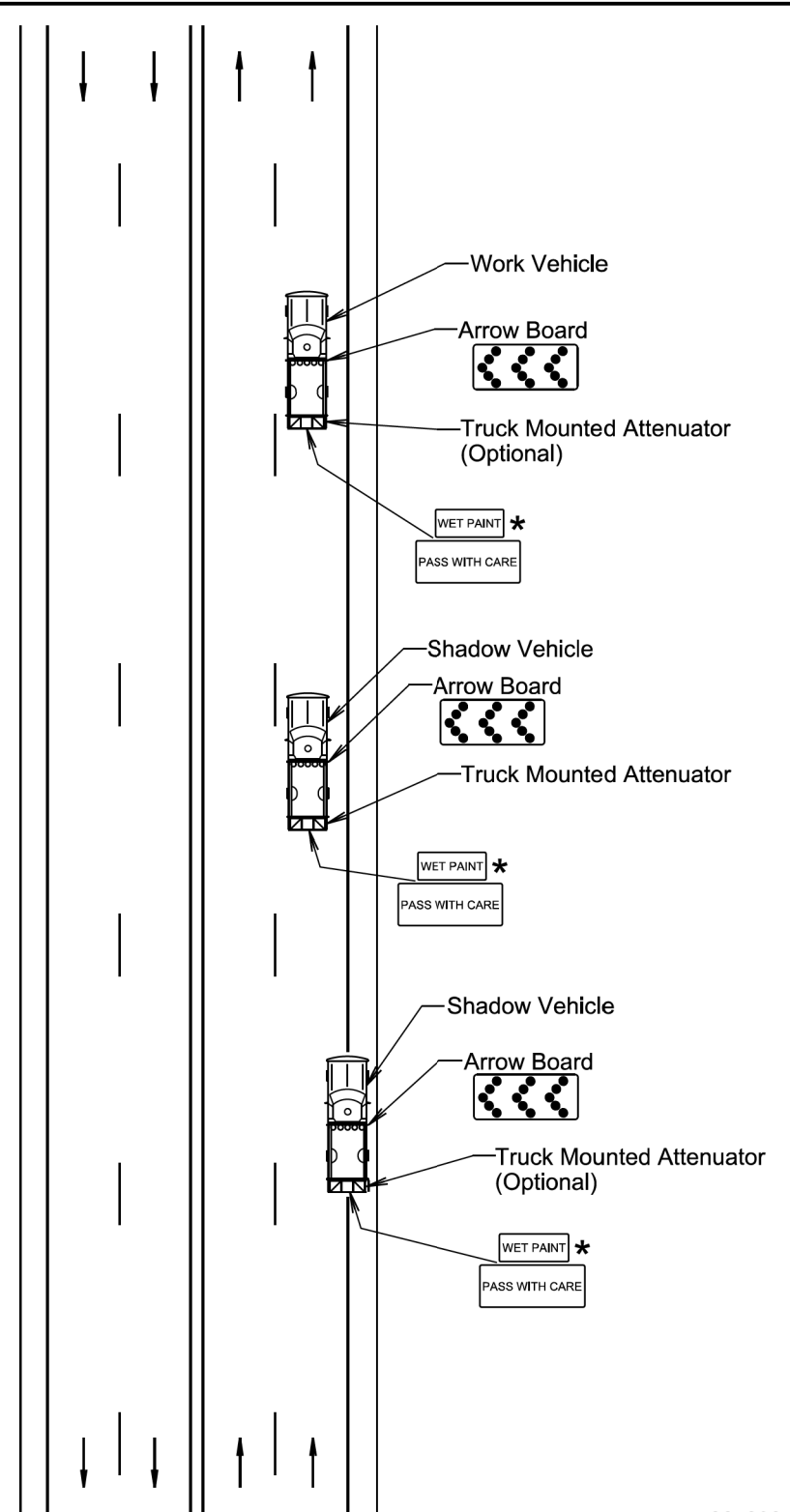
Vehicle-mounted signs will be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs will be covered or turned from view when work is not in progress.

Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

Vehicle hazard warning signals will not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

Arrow boards will, as a minimum, be Type B, with a size of 60" x 30".



All costs associated with the traffic control for mobile operation including signs, arrow boards and equipment will be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".



January 22, 2021

Published Date: 2024	SD DOT	MOBILE OPERATIONS ON MULTI-LANE HIGHWAYS	PLATE NUMBER 634.08
			Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45	500	25
50	500	50
55	750	50
60 - 65	1000	50

 Flagger
 Channelizing Device

For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

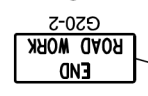
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) will be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

The channelizing devices will be drums or 42" cones.

Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

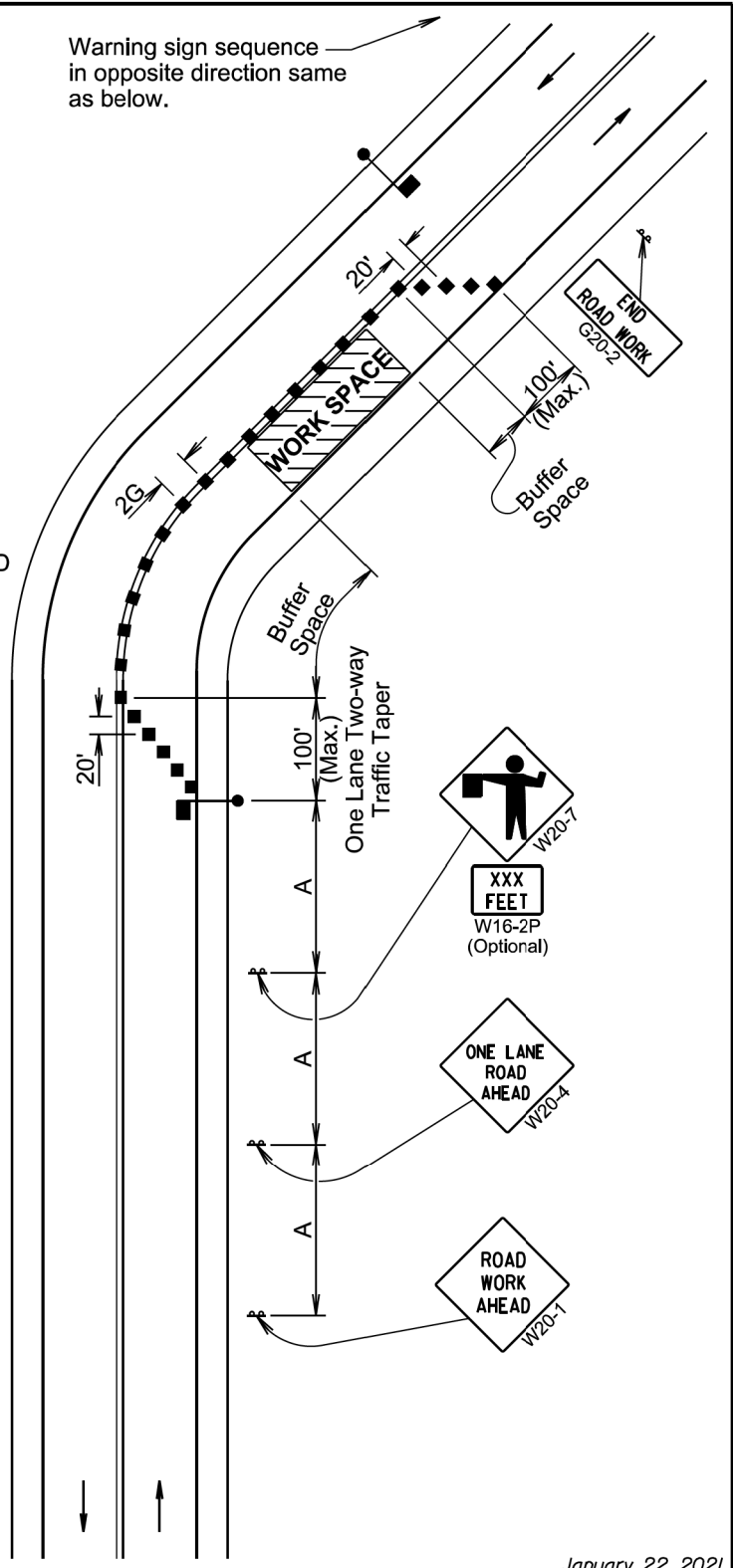


Channelizing devices and flaggers will be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

The length of A may be adjusted to fit field conditions.

Warning sign sequence in opposite direction same as below.

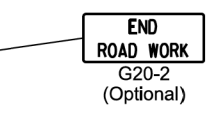


January 22, 2021

SD DOT	LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
		Sheet 1 of 1
Published Date: 2024		

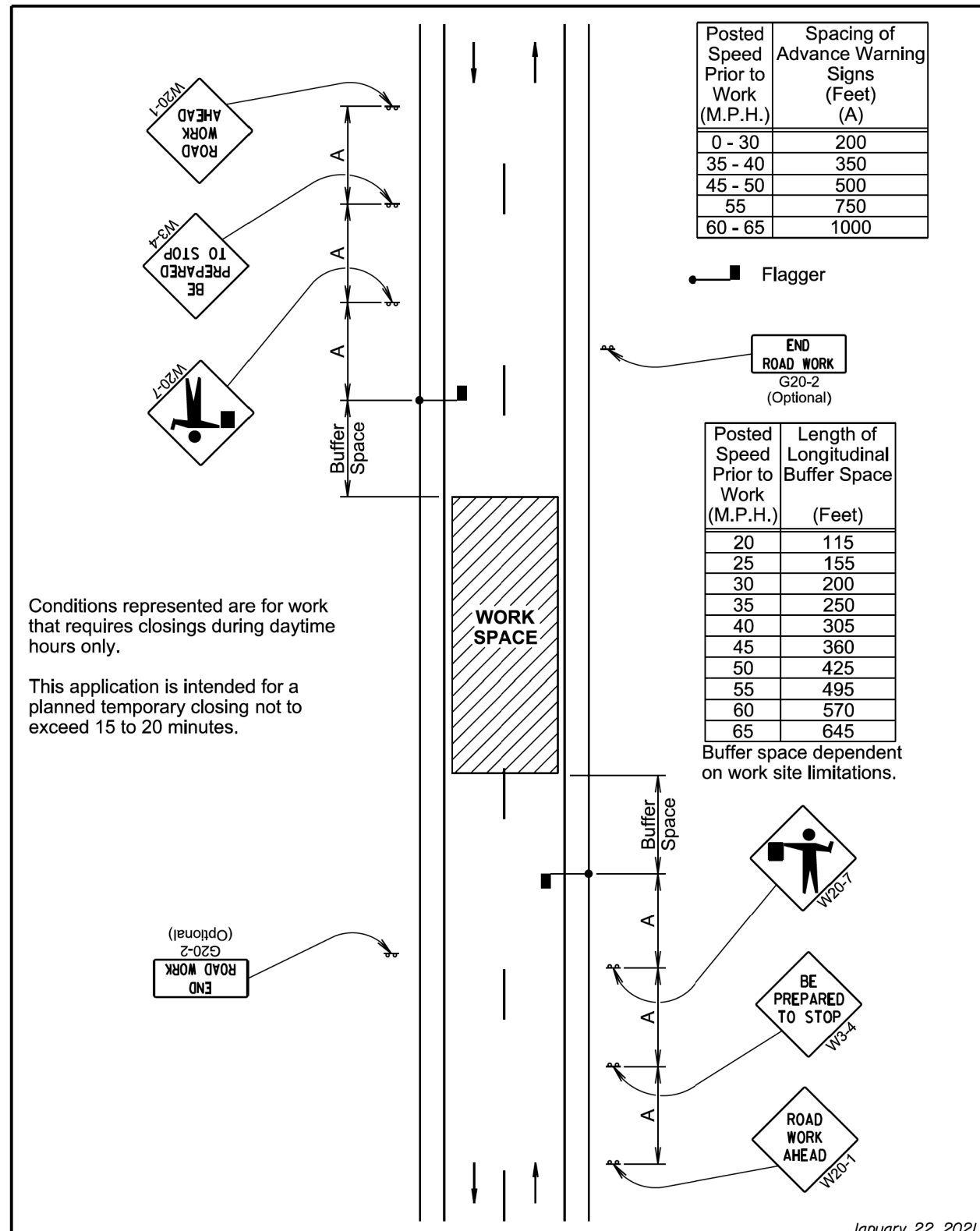
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000

 Flagger



Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645

Buffer space dependent on work site limitations.



Conditions represented are for work that requires closings during daytime hours only.

This application is intended for a planned temporary closing not to exceed 15 to 20 minutes.

January 22, 2021

SD DOT	TEMPORARY ROAD WORK	PLATE NUMBER 634.30
		Sheet 1 of 1
Published Date: 2024		

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45	500	600	25
50	500	600	50 *
55	750	660	50 *
60 - 65	1000	780	50 *

* Spacing is 40' for 42" cones.

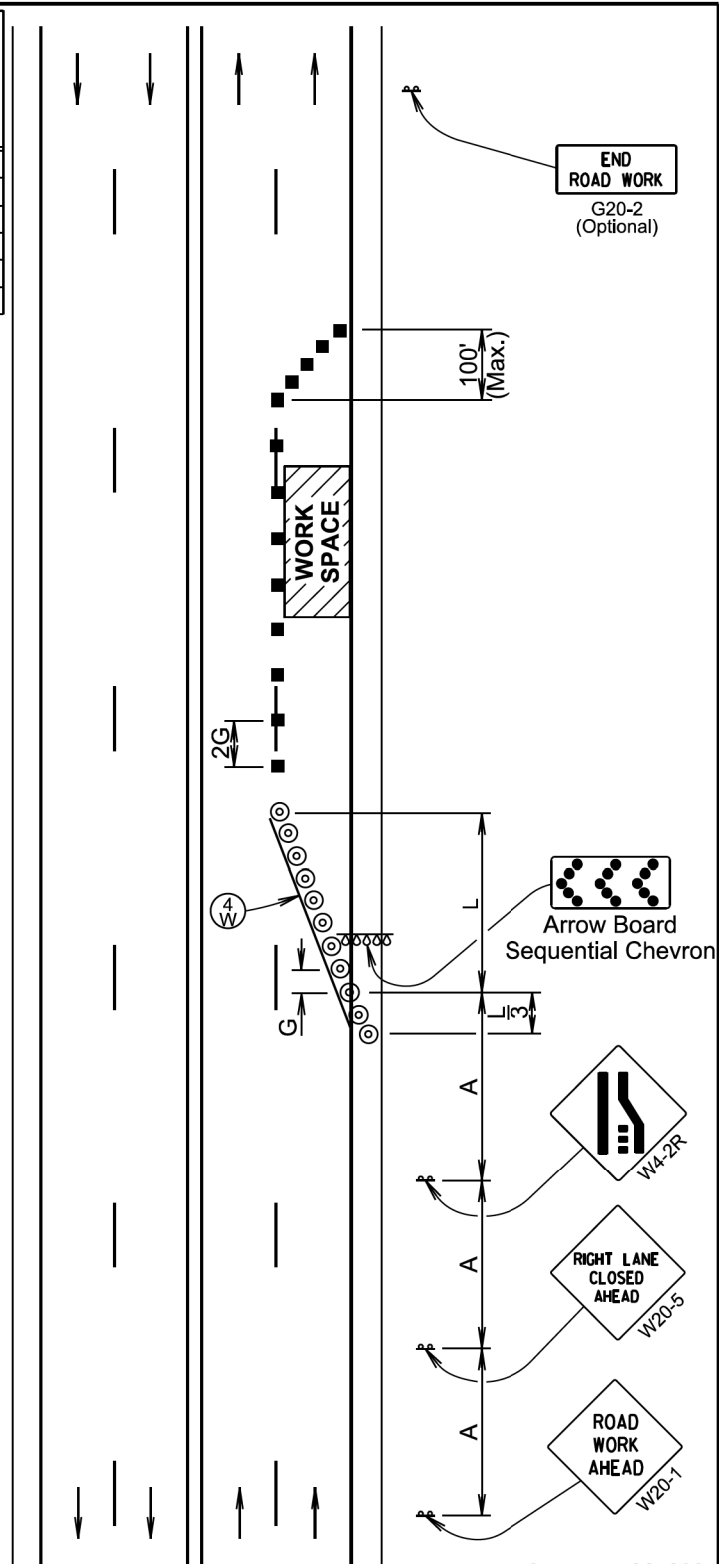
⊙ Reflectorized Drum
 ■ Channelizing Device
 (4) 4" White Temporary Pavement Marking

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

Temporary pavement markings will be used if traffic control must remain overnight.

The length of A and L may be adjusted to fit field conditions.



September 22, 2021

SD DOT	4-LANE UNDIVIDED, RIGHT LANE CLOSED	PLATE NUMBER 634.47
		Sheet 1 of 1
Published Date: 2024		

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45	500	600	25
50	500	600	50 *
55	750	660	50 *
60 - 65	1000	780	50 *

* Spacing is 40' for 42" cones.

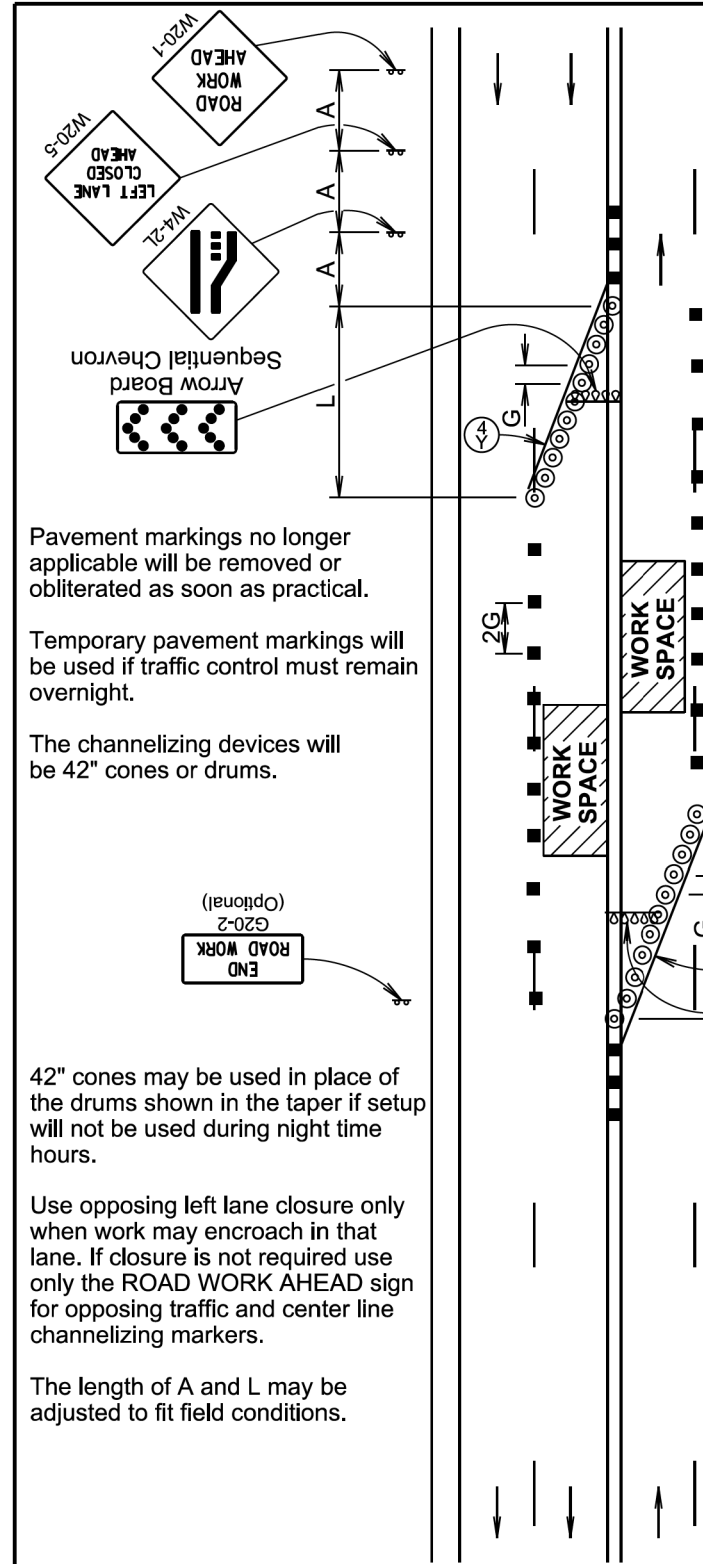
⊙ Reflectorized Drum
 ■ Channelizing Device
 (4) 4" Yellow Temporary Pavement Marking

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

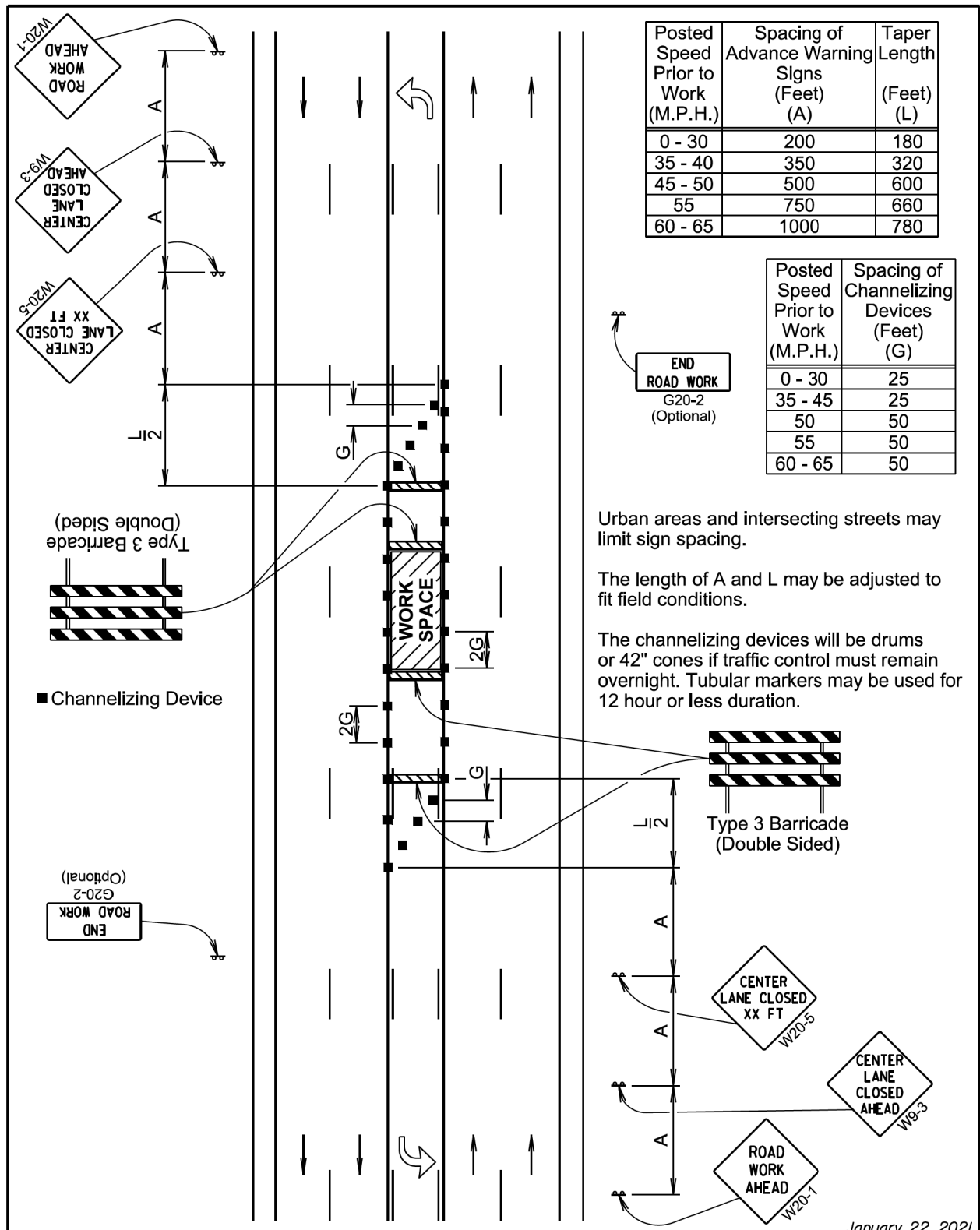
Use opposing left lane closure only when work may encroach in that lane. If closure is not required use only the ROAD WORK AHEAD sign for opposing traffic and center line channelizing markers.

The length of A and L may be adjusted to fit field conditions.

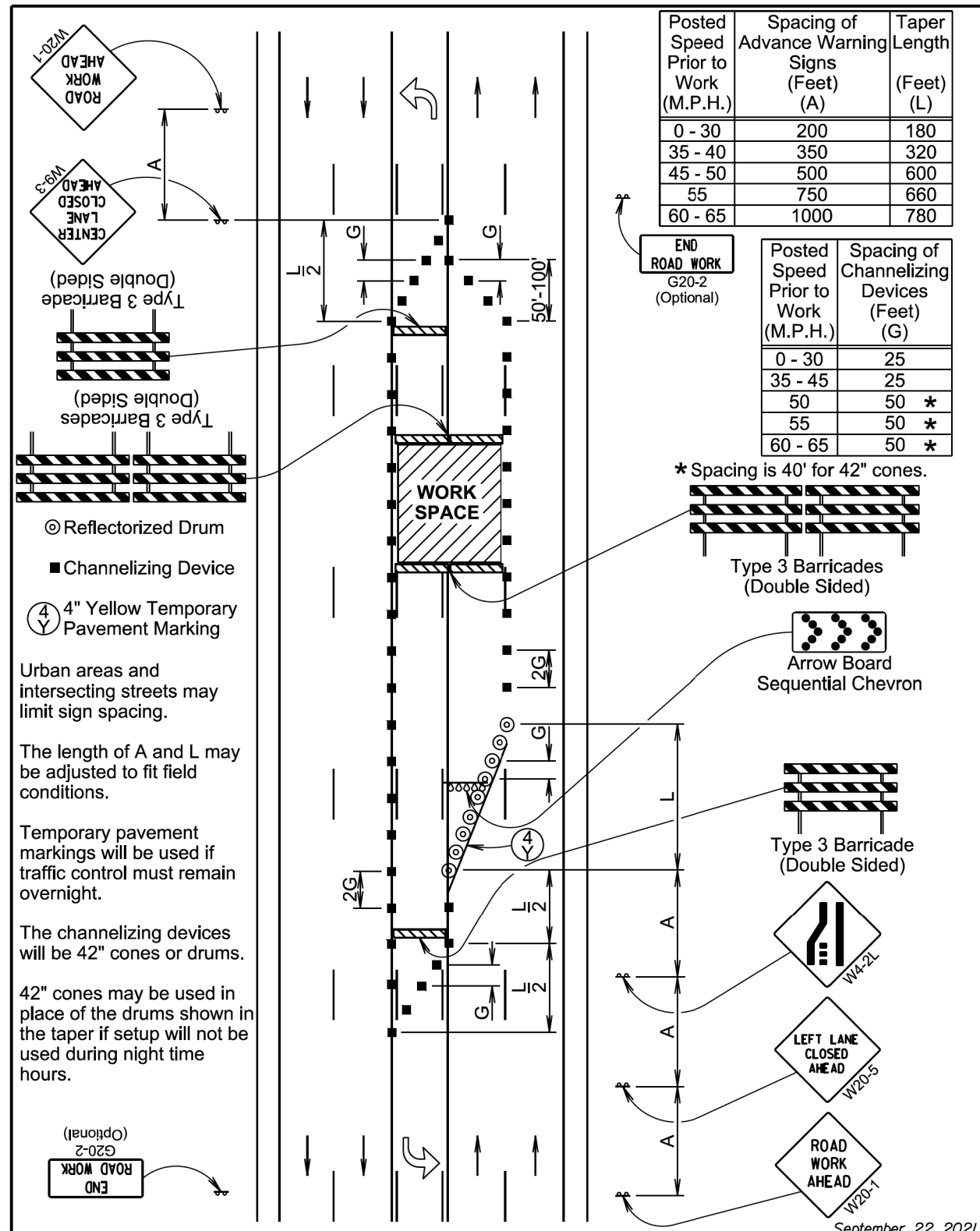


August 31, 2022

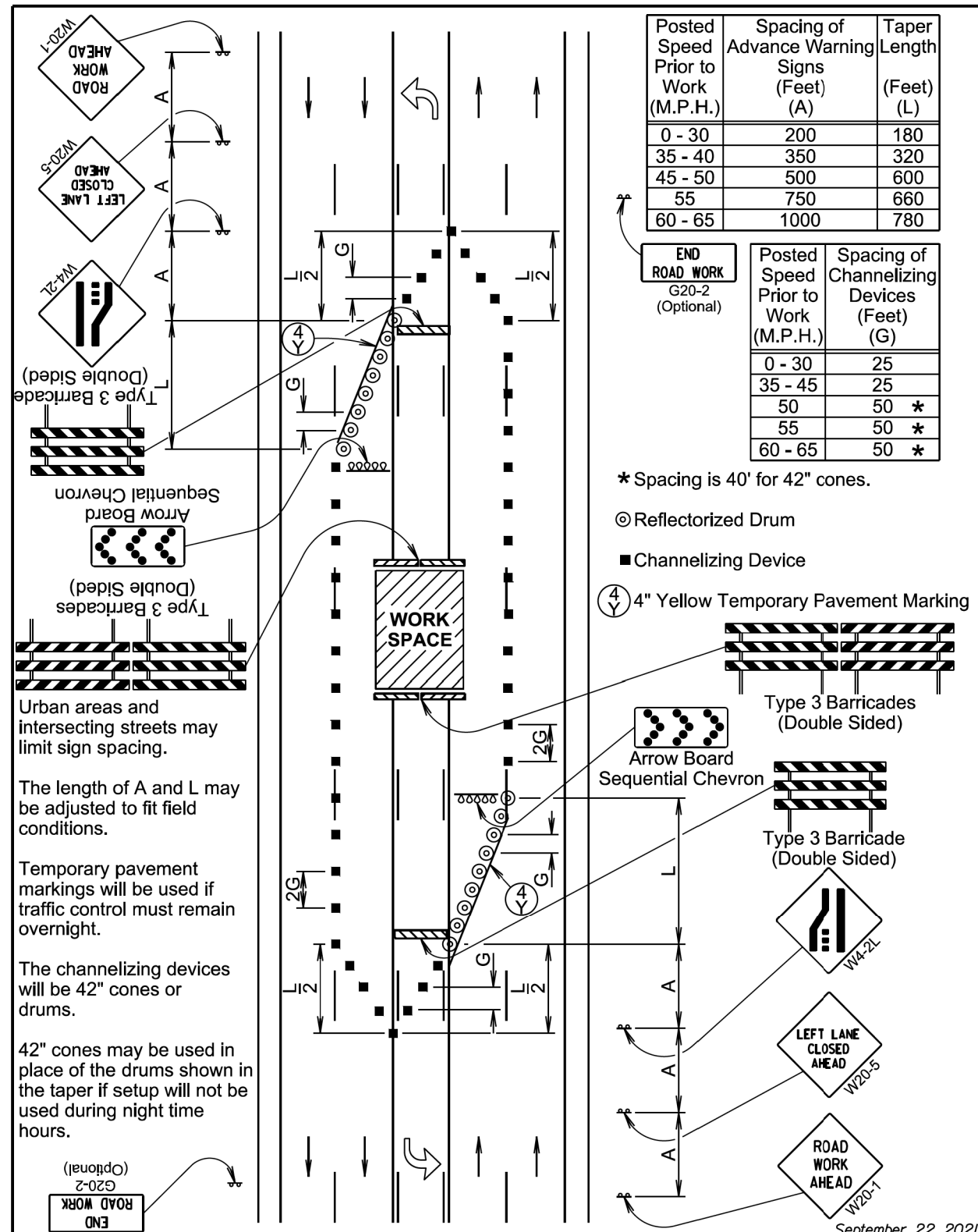
SD DOT	4-LANE UNDIVIDED, LEFT LANE CLOSED	PLATE NUMBER 634.48
		Sheet 1 of 1
Published Date: 2024		



SDDOT
5-LANE, CENTER LANE CLOSED
 PLATE NUMBER 634.55
 Sheet 1 of 1
 Published Date: 2024



SDDOT
5-LANE, INSIDE 2 LANES CLOSED
 PLATE NUMBER 634.56
 Sheet 1 of 1
 Published Date: 2024



Published Date: 2024

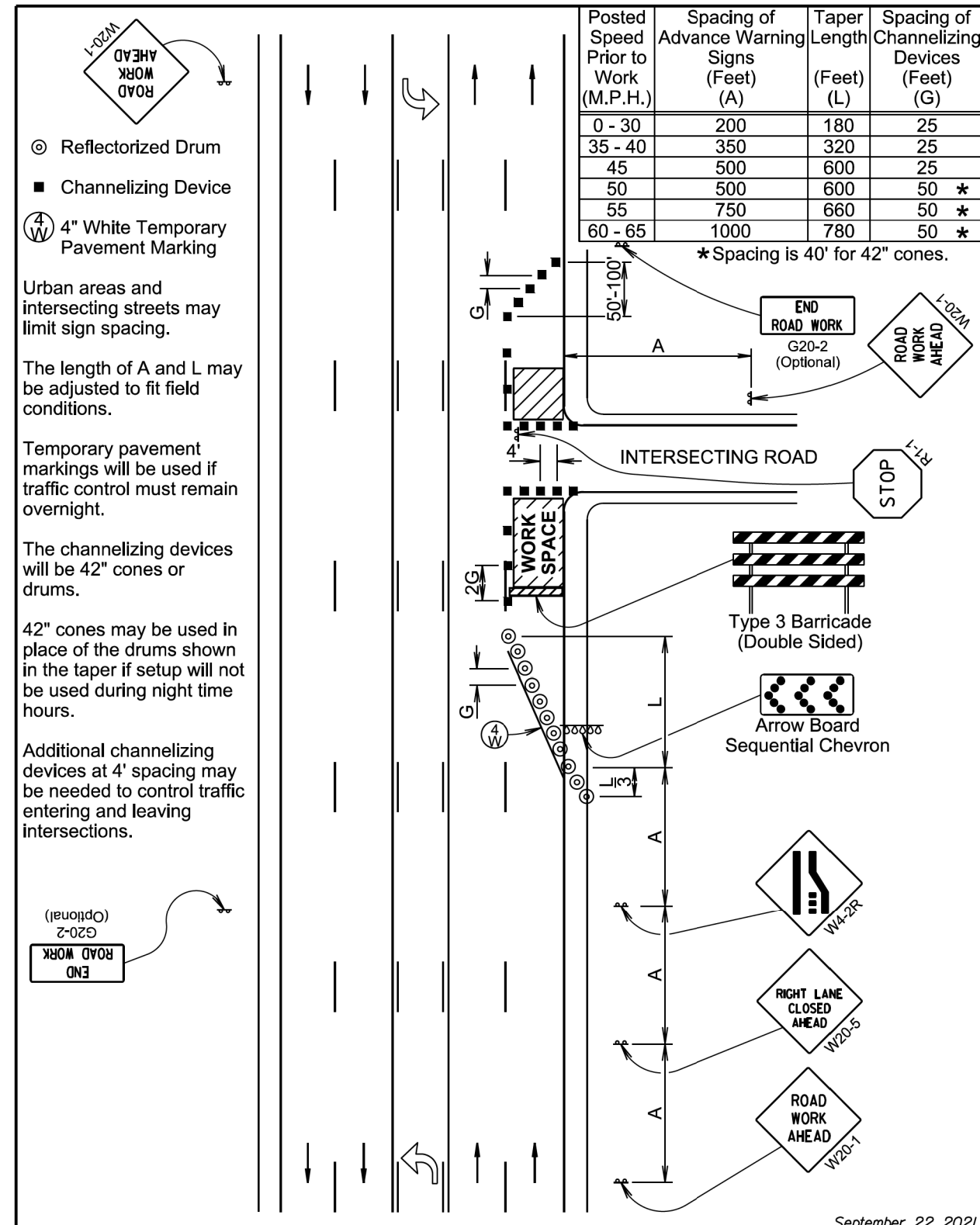
SD DOT

5-LANE, CENTER 3 LANES CLOSED

PLATE NUMBER
634.57

September 22, 2021

Sheet 1 of 1



Published Date: 2024

SD DOT

5-LANE, OUTSIDE LANE CLOSED

PLATE NUMBER
634.60

September 22, 2021

Sheet 1 of 1

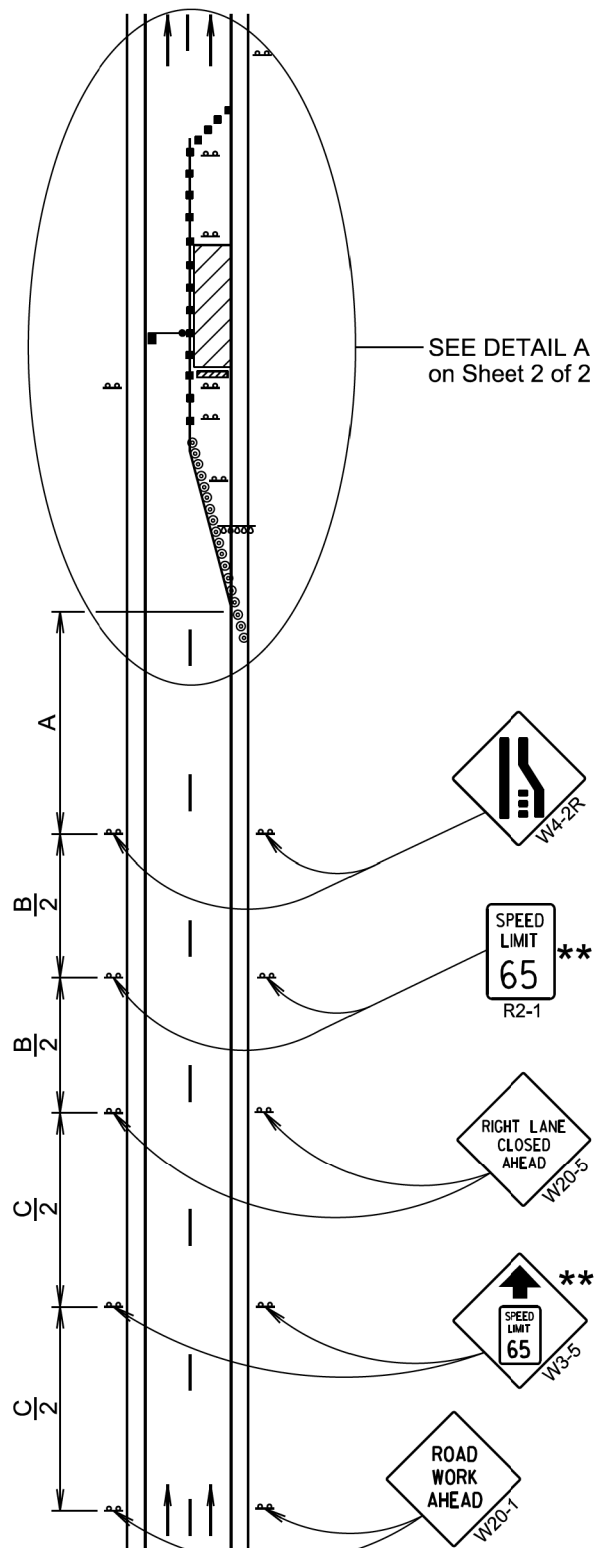
Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		
	(A)	(B)	(C)
0 - 30	200		
35 - 40	350		
45 - 50	500		
55	750		
60 - 65	1000		
70 - 80	1000	1500	2640

** Speed appropriate for location.

- ⊙ Reflectorized Drum
- Channelizing Device

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

High speed is defined as having a posted speed limit greater than 45 mph.



September 22, 2021

SD DOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
		Sheet 1 of 2
Published Date: 2024		

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)
0 - 30	25	180
35 - 40	25	320
45	25	600
50	50 *	600
55	50 *	660
60 - 65	50 *	780
70 - 80	50 *	960

* Spacing is 40' for 42" cones.

** Speed appropriate for location.

*** Use speed limit designated for the condition when workers are present in the work space. Signs will be covered or removed when workers are not present.

■ Flagger (As Necessary)

⊙ Reflectorized Drum

■ Channelizing Device

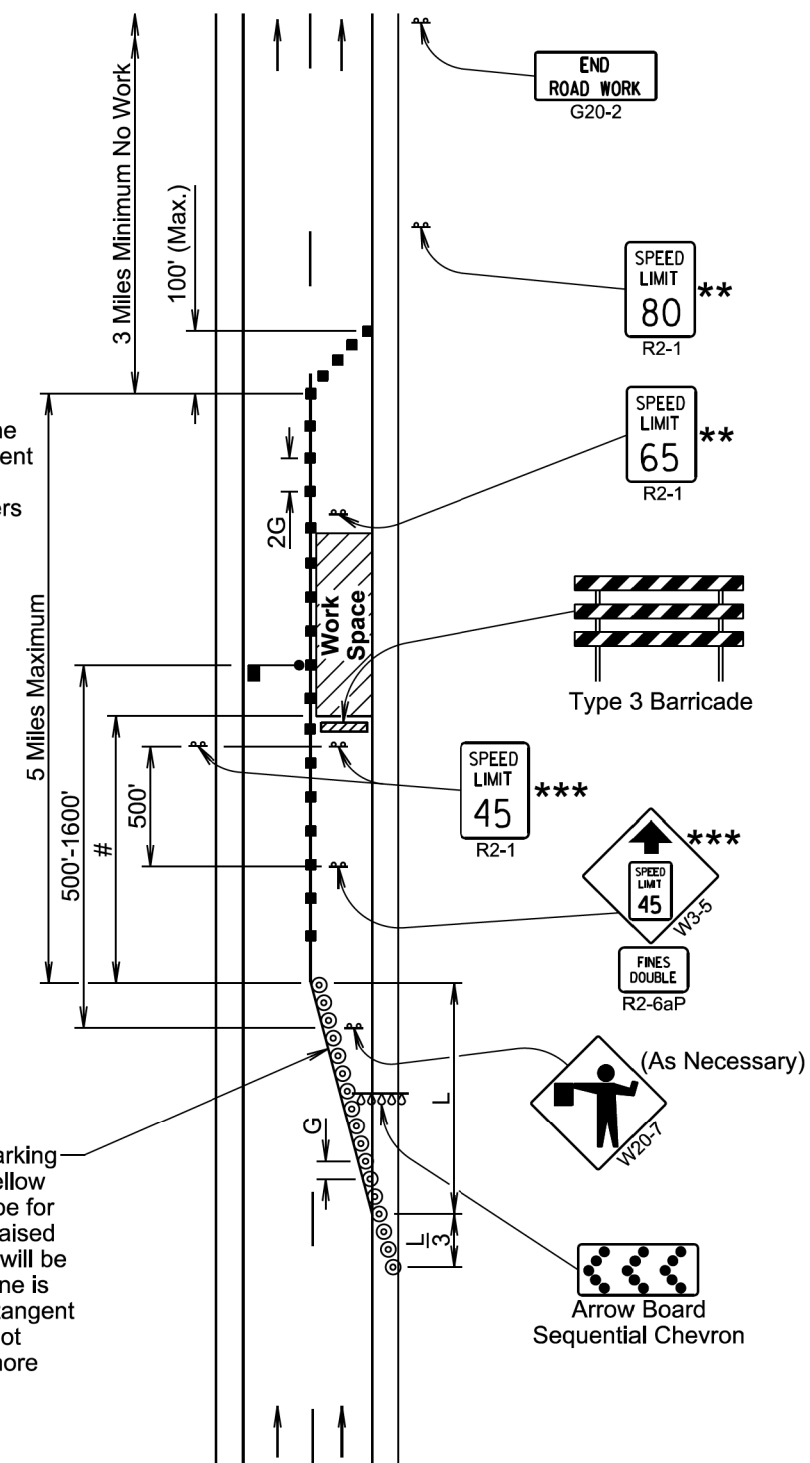
The Work Space will be a minimum of 500' from the end of the taper.

The FLAGGER sign will be used whenever there is a Flagger present.

The channelizing devices will be 42" cones or drums.

42" cones may be used in place of the drums shown in the taper if setup will not be used during night time hours.

4" white temporary pavement marking tape for right lane closures, 4" yellow temporary pavement marking tape for left lane closures, or temporary raised pavement markers at 5' spacing will be installed in the taper when the lane is closed overnight, and along the tangent section where the skip lines do not exist and the lane is closed for more than 3 days.



DETAIL A

September 22, 2021

SD DOT	WORK ZONE SPEED REDUCTION FOR INTERSTATE AND HIGH SPEED MULTI-LANE HIGHWAYS	PLATE NUMBER 634.63
		Sheet 2 of 2
Published Date: 2024		

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)		Taper Length (Feet) (L)
	(A)	(B)	
45 - 50	500		600
55	750		660
60 - 65	1000	780	
	(A)	(B)	
70 - 80	1000	1500	1125

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 80	50 *

* Spacing is 40' for 42" cones.

■ Channelizing Device

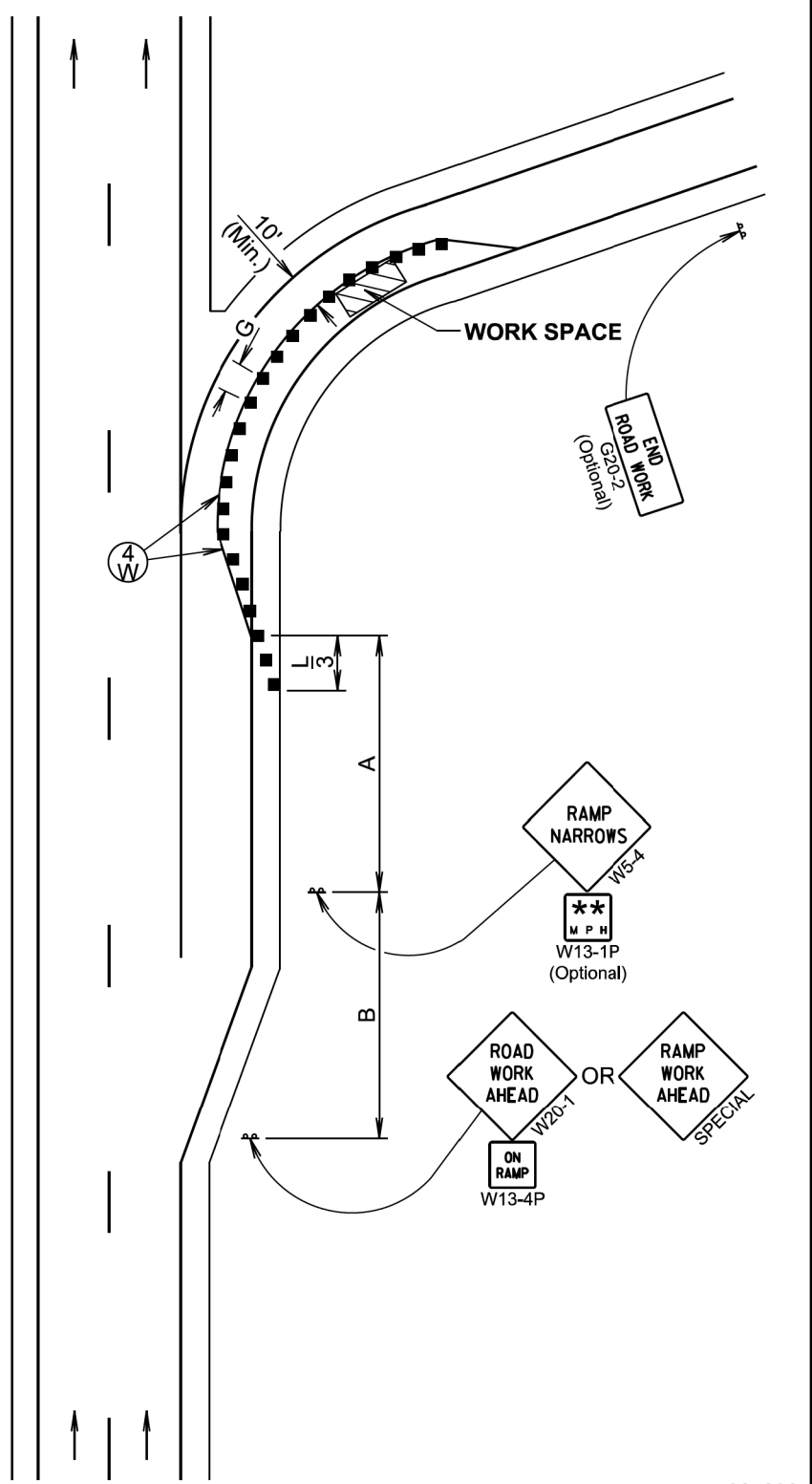
④ W 4" White Temporary Pavement Marking

** Need and safe speed to be determined by the Engineer.

Temporary pavement markings will be used if traffic control must remain overnight.

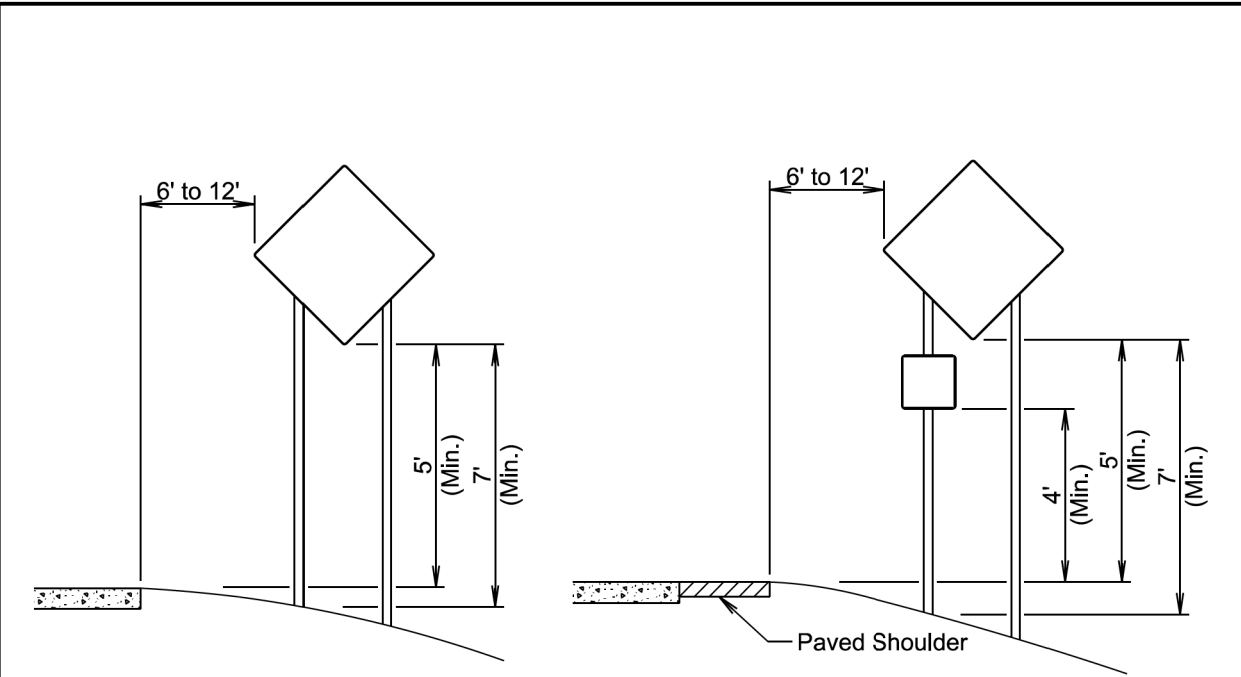
The channelizing devices will be drums or 42" cones if traffic control must remain overnight.

Truck off-tracking should be considered when determining whether the 10-foot minimum lane width is adequate.



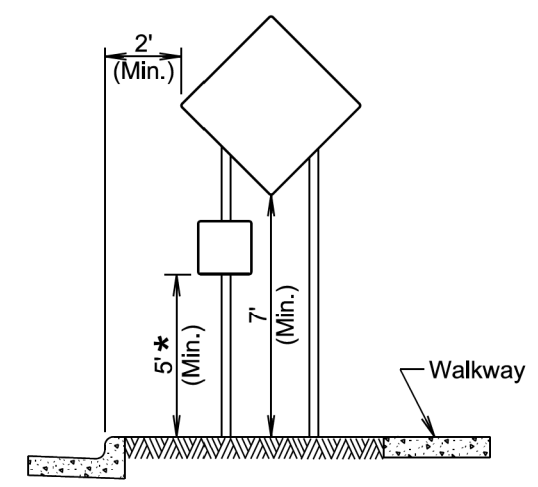
January 22, 2021

SD DOT	PARTIAL EXIT RAMP CLOSURE	PLATE NUMBER 634.69
		Sheet 1 of 1
Published Date: 2024		

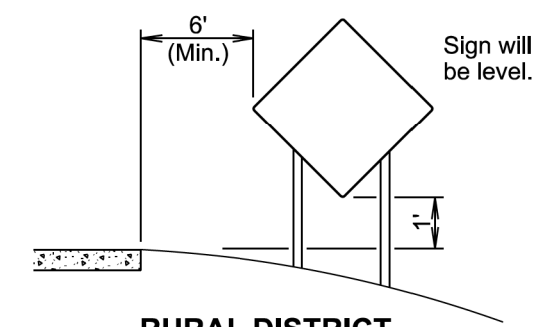


RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

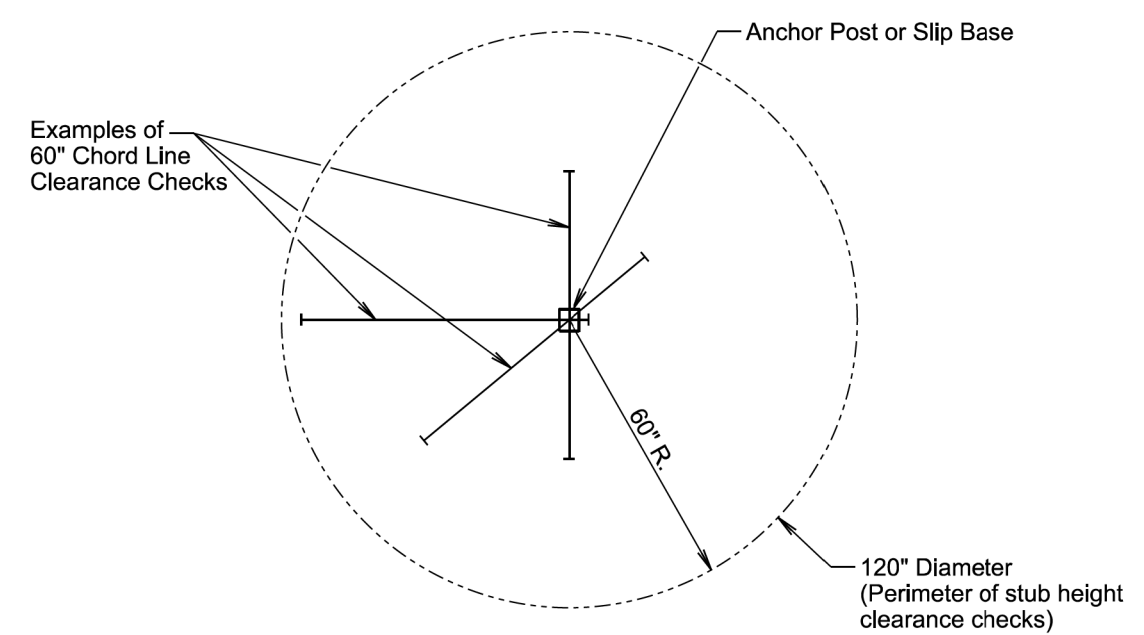


RURAL DISTRICT 3 DAY MAXIMUM

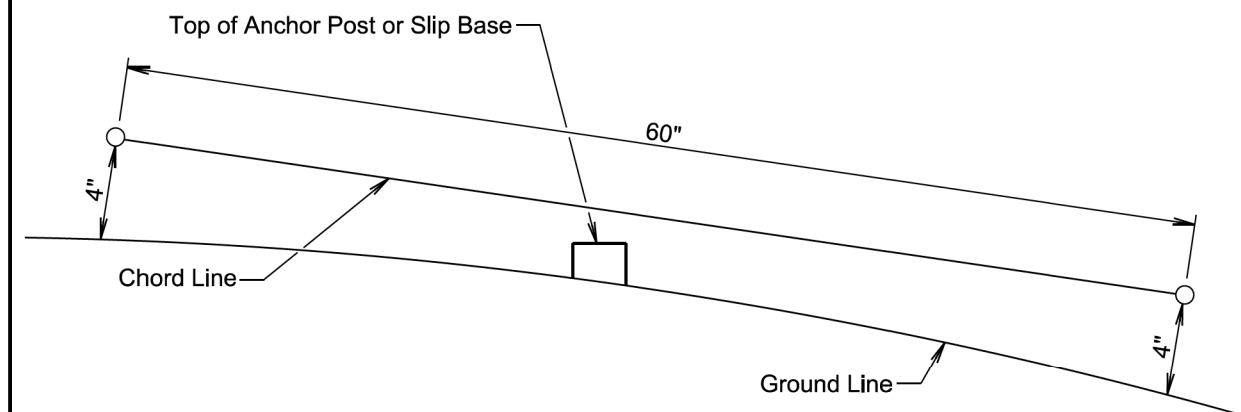
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

SD DOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
		Sheet 1 of 1
Published Date: 2024		



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases WILL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height will be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

January 22, 2021

SD DOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
		Sheet 1 of 1

Published Date: 2024