

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0030 (37)	1	7

Plotting Date: 02/15/2024

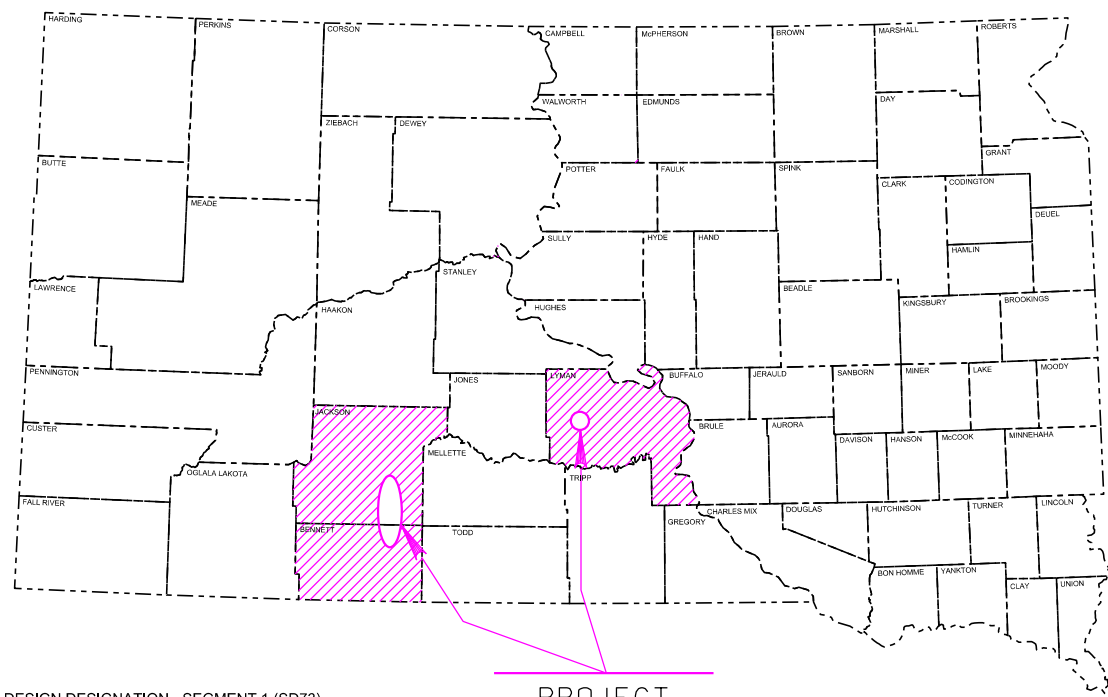
PROJECT PH 0030(37) HIGHWAYS SD73 & SD248

BENNETT, JACKSON, & LYMAN COUNTIES

DURABLE PAVEMENT MARKING
PCN 05VP

INDEX OF SHEETS

SHEET 1	Title Sheet
SHEETS 2-4	Estimates, Notes, Marking/Grooving Details
SHEETS 5-7	Standard Plates



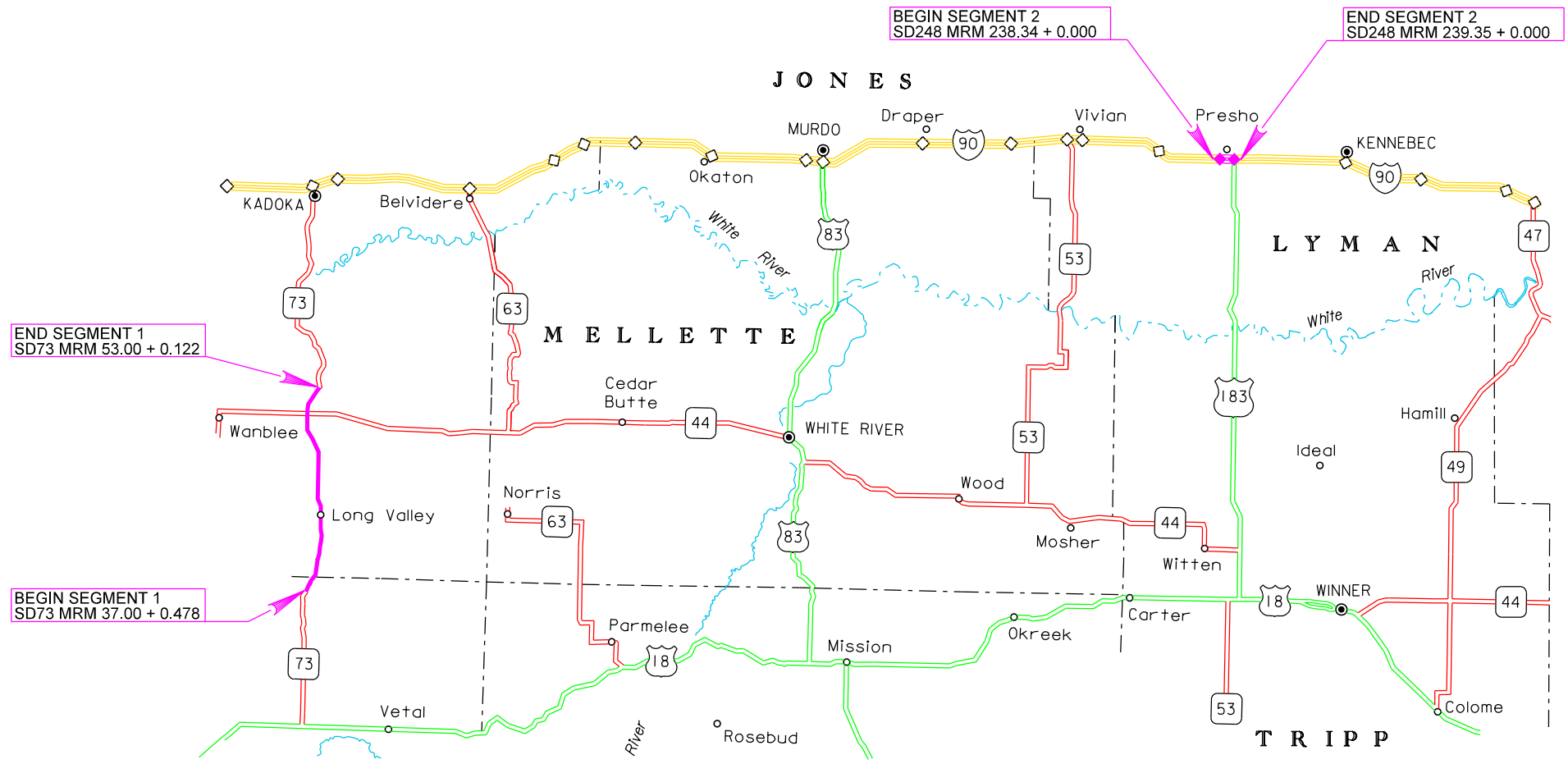
PROJECT

DESIGN DESIGNATION - SEGMENT 1 (SD73)

AADT (2022)	626
AADT (2042)	904
DHV	106
D	50%
DHV T%	9.8%
AADT T%	21.6%
V	65 mph

DESIGN DESIGNATION - SEGMENT 2 (SD248)

AADT (2022)	176
AADT (2042)	249
DHV	40
D	50%
DHV T%	10.3%
AADT T%	22.6%
V	45/55 mph



Segment 1 Net Length:	82,389 Feet	15.604 Miles
Segment 2 Net Length:	5,333 Feet	1.010 Miles
Total Net Length:	87,722 Feet	16.614 Miles

STORMWATER PERMIT: NOT REQUIRED

10

April 17, 2024

Plot Scale - 1:200

Plotted From -

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ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
633E1201	High Build Waterborne Pavement Marking Paint with Reflective Elements, White	932	Gal
633E1206	High Build Waterborne Pavement Marking Paint with Reflective Elements, Yellow	366	Gal
633E5100	Grooving for Durable Pavement Marking, 4"	68,985	Ft
634E0010	Flagging	200.0	Hour
634E0020	Pilot Car	100.0	Hour
634E0110	Traffic Control Signs	315.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS

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 B4: BALD EAGLE

Bald eagles are known to occur in this area.

Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	PH 0030(37)	2	7

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: HISTORIC PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historic 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

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES (CONT.)

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.

PROJECT SCOPE AND GENERAL NOTES

This project consists of grooving and painting existing* 4" yellow centerlines and 4" white edgelines on Highways SD73 and SD248, and 4" white lane lines on Highway SD248.

All work on this project will be sequenced so that all pavement markings that are removed will be replaced with new pavement markings on the same day.

*Some markings may be modified following the Department's checking of no passing zones, see note below.

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 at least a 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

All construction operations will be conducted in the general direction of traffic movement. Grooving operations will utilize lane closures (with flaggers on Segment 1), and painting operations will utilize a mobile operation. Lane closures will not be allowed to remain overnight.

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

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

FLAGGING

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



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".

ITEMIZED LISTS FOR TRAFFIC CONTROL

Segment 1

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT ___ MILES	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					114.0

Segment 2

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol) (2 each)	4	48" x 48"	16.0	64.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD (2 each)	4	48" x 48"	16.0	64.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					201.0

PAVEMENT MARKING PAINT

The Contractor will advise the Engineer a minimum of 3 weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones.

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 consisting of glass beads as well as bonded core reflective elements will be adhered to the paint.

The bonded core reflective elements will contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. The bonded core reflective elements will provide a 50/50 blend of dry to wet ratio of reflective element. All microcrystalline ceramic beads bonded to reflective elements will have a minimum index of refraction of 1.8 for dry retroreflectivity and 2.4 for wet retroreflectivity when tested using the liquid oil immersion method.

The Department will take retroreflectivity readings on the pavement marking lines no sooner than 3 days and no later than 30 days after the completion of all line applications required for an individual highway route using a portable retroreflectometer conforming to 30-meter geometry. Retroreflectivity readings will be taken on a test location with cleaning being limited to light hand brooming.

Pavement markings not conforming to the retroreflectivity requirements will be removed and replaced. If replacement of markings cannot be applied within the same year, the Contractor will schedule subject work to be completed no later than June 15th in the following year. Upon replacement, the retroreflectivity testing process will be done again requiring new readings.

The Department will randomly select one test location per mile of each edge line including ramps and one test location per mile of centerline (solid and/or skip line will be considered as one centerline). Three retroreflectivity readings will be taken at each test location. The three readings will be averaged and become the reading for that test location.

Initial readings:

Pavement Marking Color	Minimum Value
White	350 mc/m ² /lux
Yellow	275 mc/m ² /lux

All pavement markings not conforming to the requirements provided in these plans will be considered deficient and will be removed and replaced. Additional retroreflectivity readings will be taken by the Department to determine the limits of removal. The removal will be accomplished using suitable sand blasting or grinding equipment unless the Engineer authorizes other means. The removal process will remove at least 90% of the deficient line, with no excessive scarring of the existing pavement. The removal width will be one inch wider all around the nominal width of the pavement marking to be removed. Removal and replacement of the pavement markings will be at the Contractor's expense, with no cost incurred by the State.

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 = 5.3 Lbs/Gal.
Composite Reflective Elements = 2.1 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.

GROOVING FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT

The Contractor will establish a positive means for the removal of the grinding and/or grooving residue. Residue from dry grooving will be vacuumed. Solid residue will be removed from the pavement surfaces before being blown by traffic action or wind. The Contractor will conduct this work to control and minimize airborne dust and similar debris that may become a hazard to motor vehicle operation or nuisance to property owners. Residue from wet grooving

GROOVING FOR HIGH BUILD WATERBORNE PAVEMENT MARKING PAINT (CONT.)

will not be permitted to flow across lanes being used by public traffic or into gutter or drainage facilities. Residue, whether in solid or slurry form, will be disposed of in a manner that will prevent it from reaching any waterway in a concentrated state. All costs for removal of grinding and/or grooving residue will be included in the contract unit price per foot for "Grooving for Durable Pavement Marking" contract item.

Unless otherwise specified in the plans, the Contractor will groove the surface for High Build Waterborne Pavement Marking Paint as specified in these plans and as per the manufacturer's instructions.

The grooving will be completed within the following tolerances:

Description	Specification	Tolerance
Depth of Groove	Marking Thickness ¹ + 15 mils	+ 5 mils
Width of Groove	5 to 6 inches	
Length of Skip Lines ²	10 foot 6 inches	± 3 inch
Tapers at ends of lines	6 to 9 inches	
Between Double Lines	4 inches	± 1/2 inch

¹ Marking thickness will include the thickness of marking material and reflective media.

² Additional length may be required as specified in the plans.

The equipment will be capable of the following:

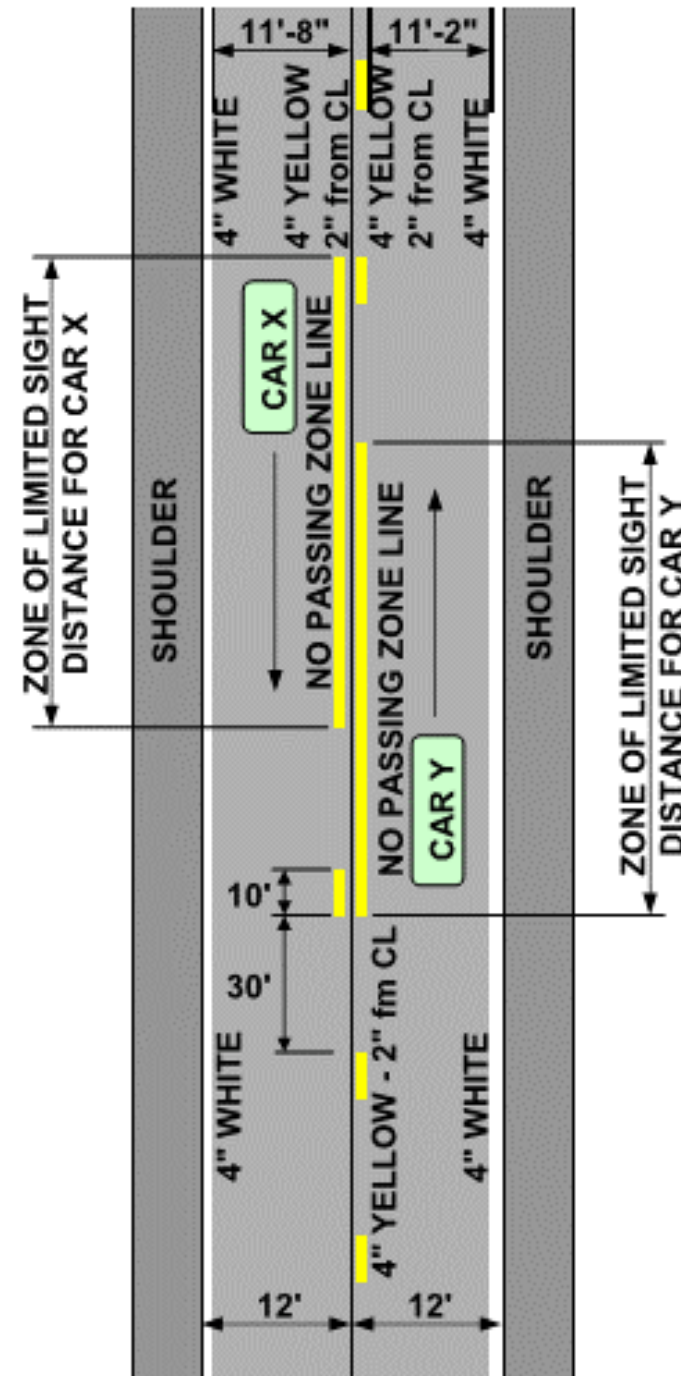
- Grooving the total width of the groove in one pass or uniform depths with multiple passes.
- Grooving without causing damage to the pavement joints or joint sealant material.
- Provide uniform alignment and depth.
- Moving continuously to permit a mobile traffic work operation.

If damage occurs, including, but not limited to, joints, joint sealant material, and backer rod, the grooving operation will be stopped and modifications will be made to the grooving operation to prevent further damage. The Contractor will be required to use specially prepared circular diamond blade cutting heads to prevent damage at the joints. Damage caused will be repaired or replaced by the Contractor, as directed by the Engineer. No additional payment will be made for the repair work or any reapplication of the pavement marking in the area of the repair.

TABLE OF GROOVING QUANTITIES

SEGMENT	1	2	TOTAL
GROOVING (FT)	58,619	10,366	68,985

PAVEMENT MARKING DETAIL*



4" Yellow Skip Centerline, when not adjacent to a 4" Yellow No Passing Zone, will be placed to the south or east side of centerline.

ESTIMATE OF QUANTITIES

ROUTE	HIGH GRADE POLYMER PAINT WITH ELEMENTS	
	WHITE	YELLOW
Segment 1	868 Gals.	318 Gals.
Segment 2	64 Gals.	48 Gals.
TOTALS	932 Gals.	366 Gals.

PLOT SCALE - 1:200

PLOT NAME - 2

* 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.

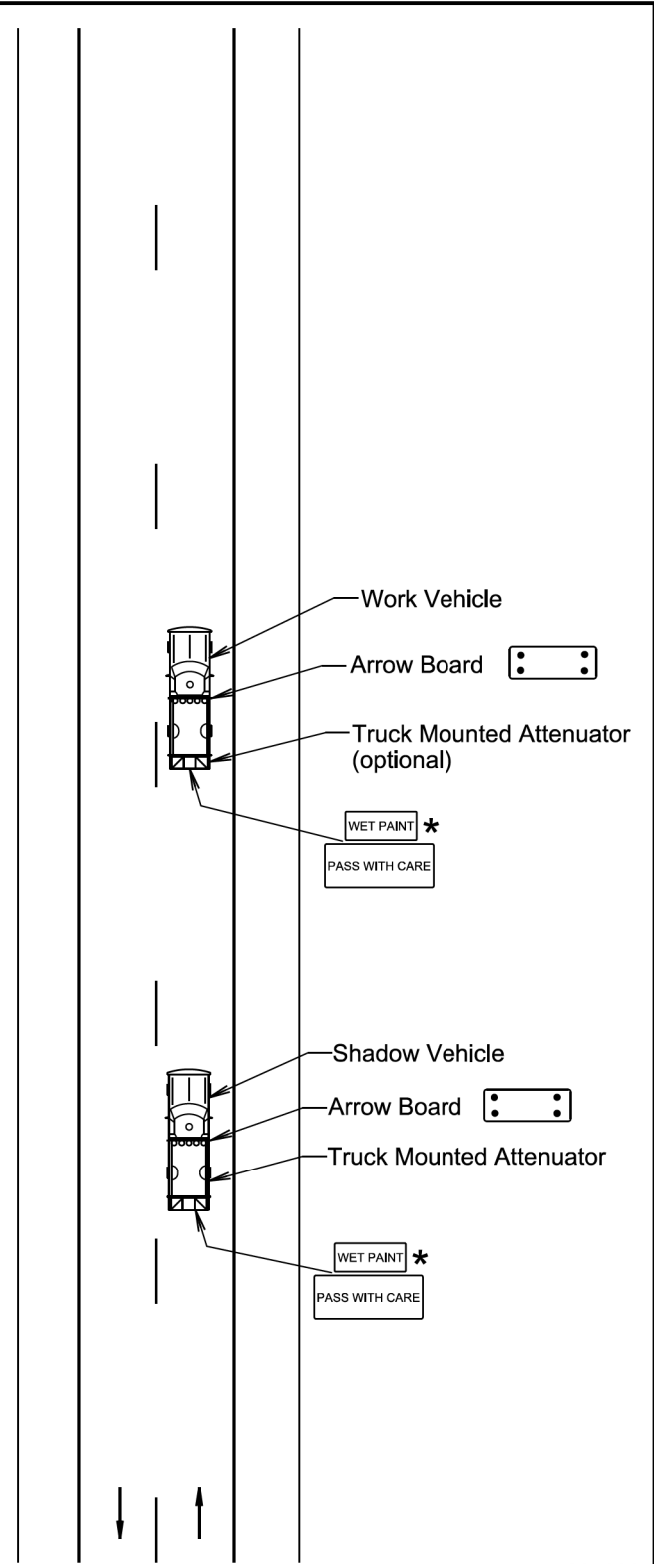
Shadow and Work vehicles will display high-intensity rotating, flashing, oscillating, or strobe lights, flags, signs, or arrow boards.

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	S D D O T	MOBILE OPERATIONS ON 2-LANE ROAD	PLATE NUMBER 634.06
			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.

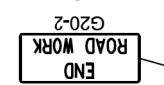
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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.

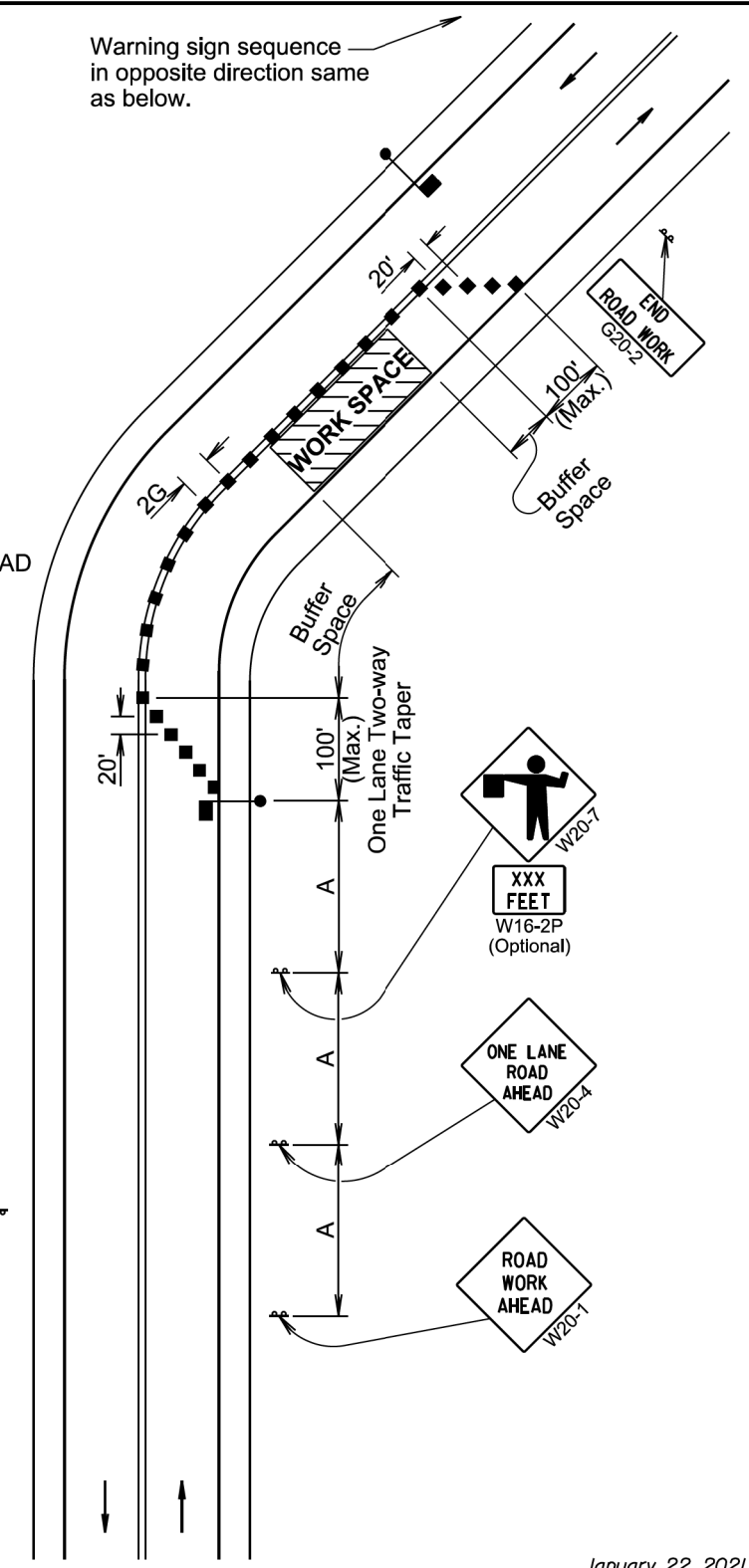


Channelizing devices and flaggers will be used at intersecting roads to control intersecting road traffic as required.

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.



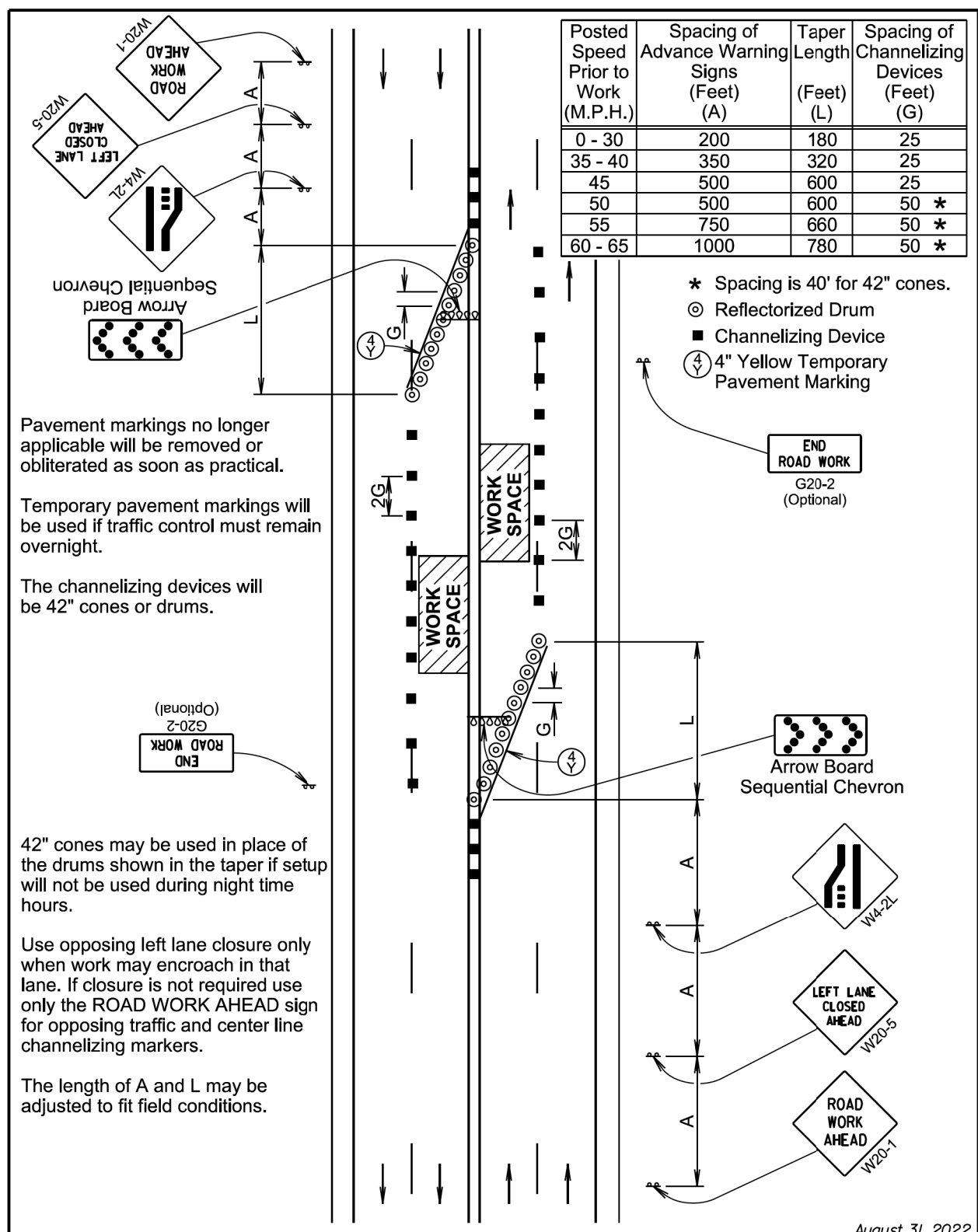
January 22, 2021

Published Date: 2024	S D D O T	LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1

PLOTTED FROM - TRPR25584

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PLOT SCALE - 1:200



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

Pavement markings no longer applicable will be removed or obliterated as soon as practical.

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

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

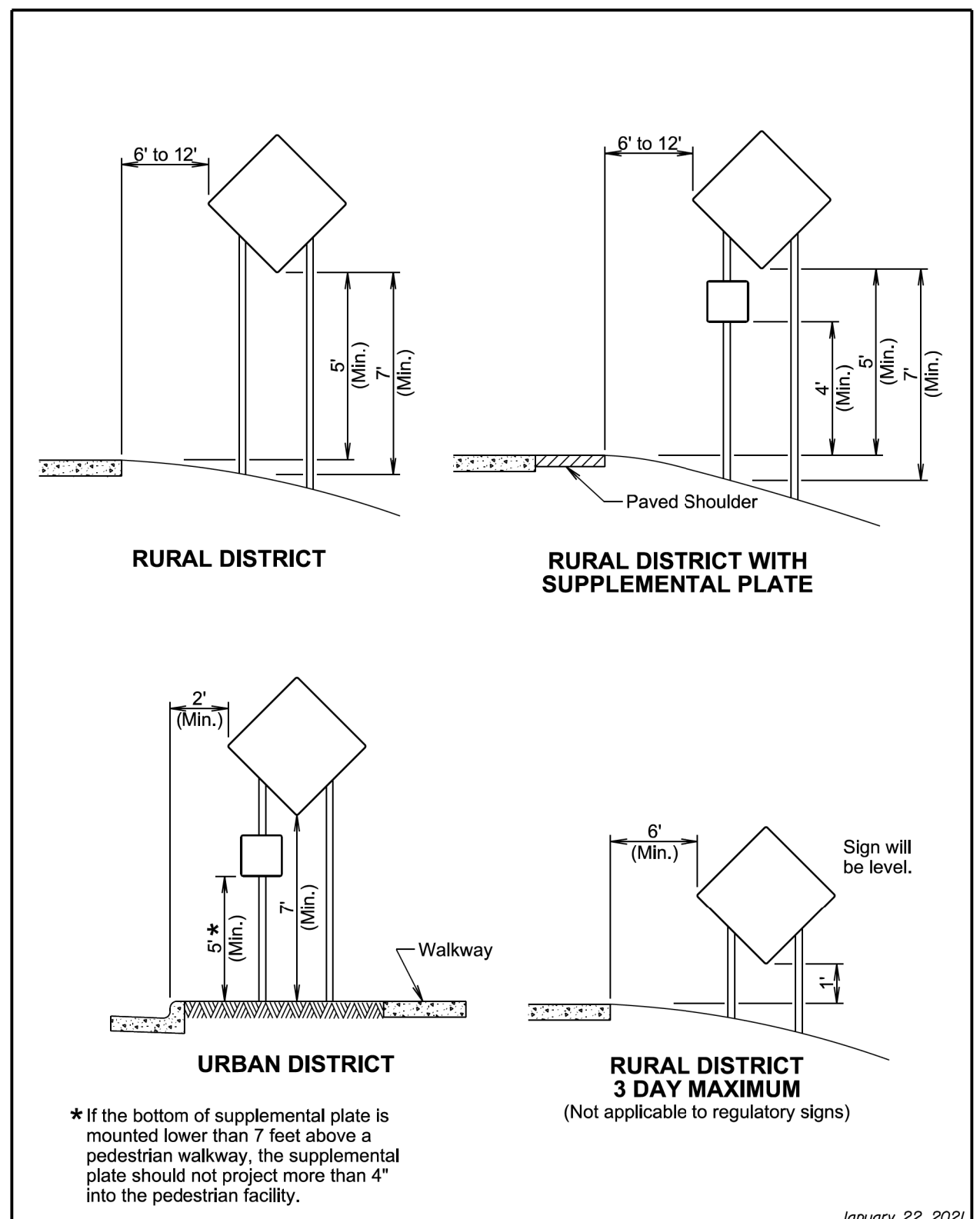
S D D O T	4-LANE UNDIVIDED, LEFT LANE CLOSED	PLATE NUMBER 634.48
		Sheet 1 of 1

Published Date: 2024

PLOTTED FROM - TRPR25584

PLOT NAME - 3

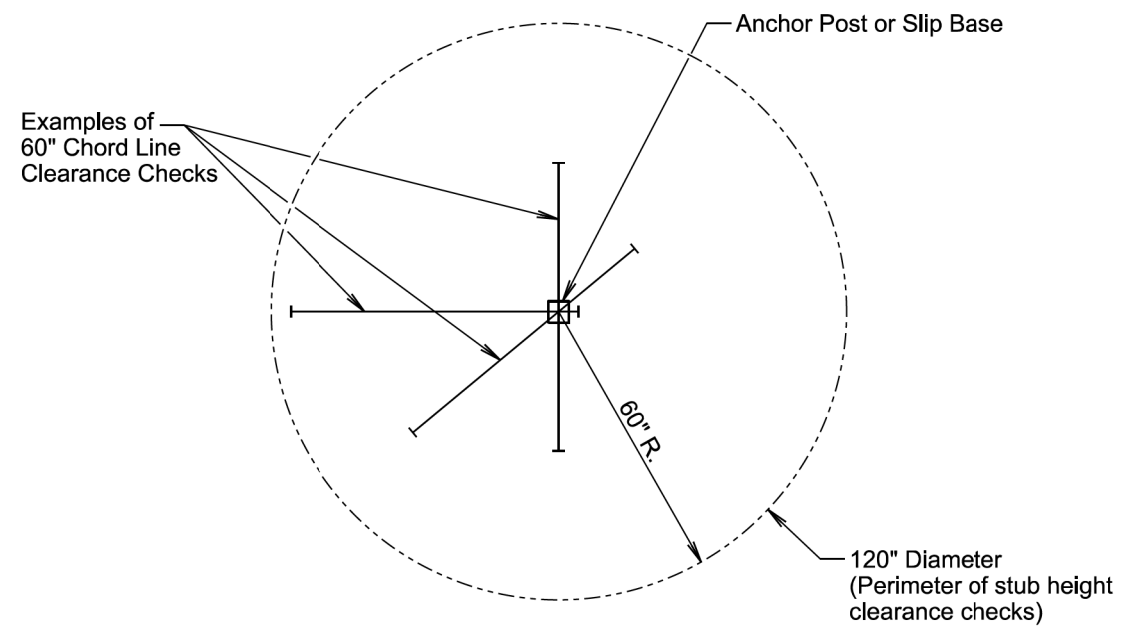
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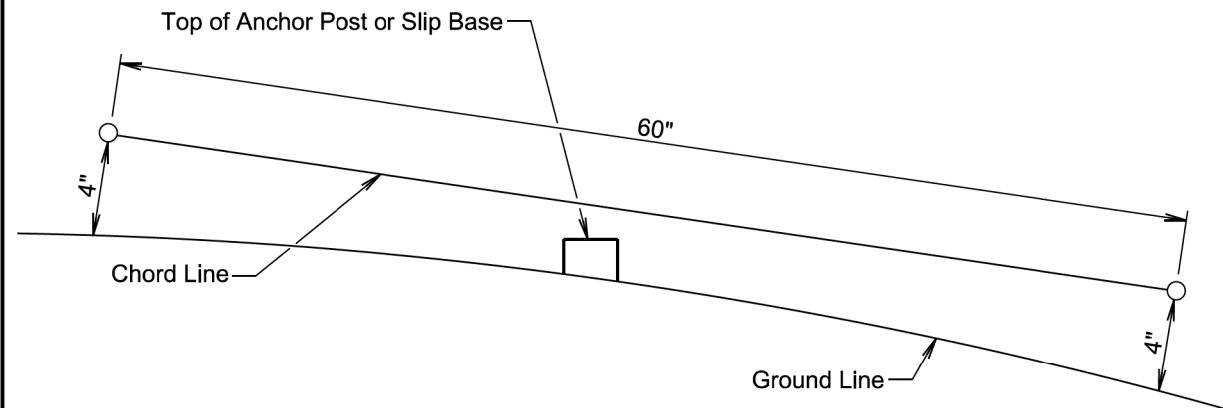
S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
		Sheet 1 of 1

Published Date: 2024

January 22, 2021



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

Published Date: 2024

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BREAKAWAY SUPPORT STUB CLEARANCE

PLATE NUMBER
634.99

Sheet 1 of 1