

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

**PROJECT 000N-491
US HIGHWAY 16A
CUSTER COUNTY**

ASPHALT PATCHING ON BUFFALO GUARD ENDS
PCN i4a3

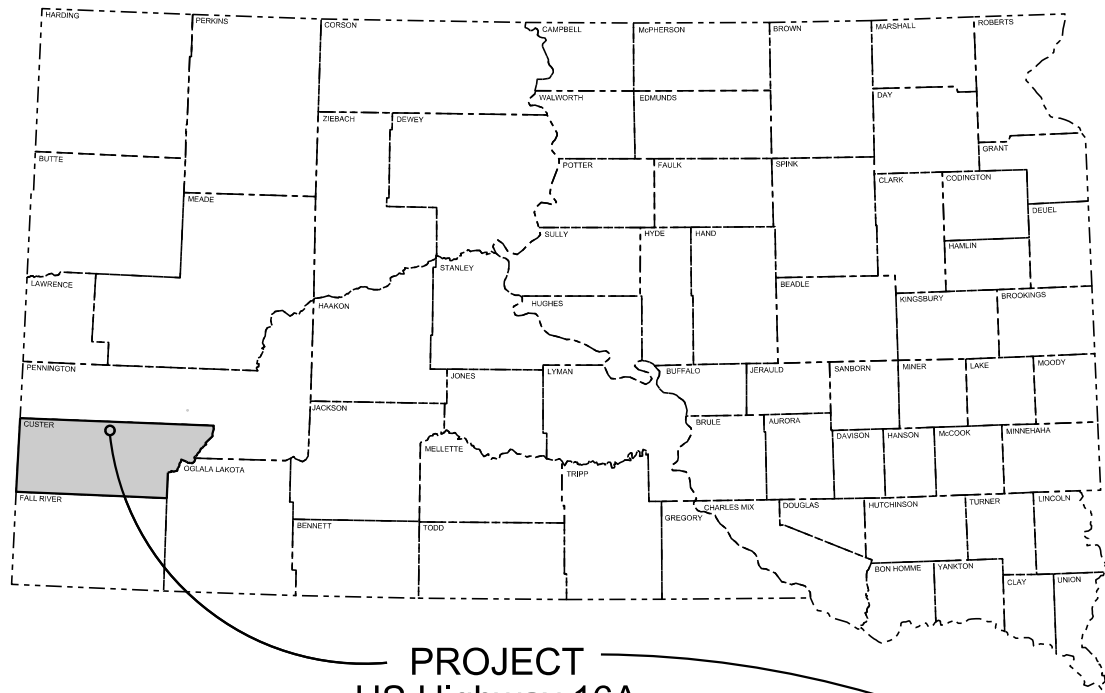
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000N-491	1	10

Plotting Date: 05/23/2016

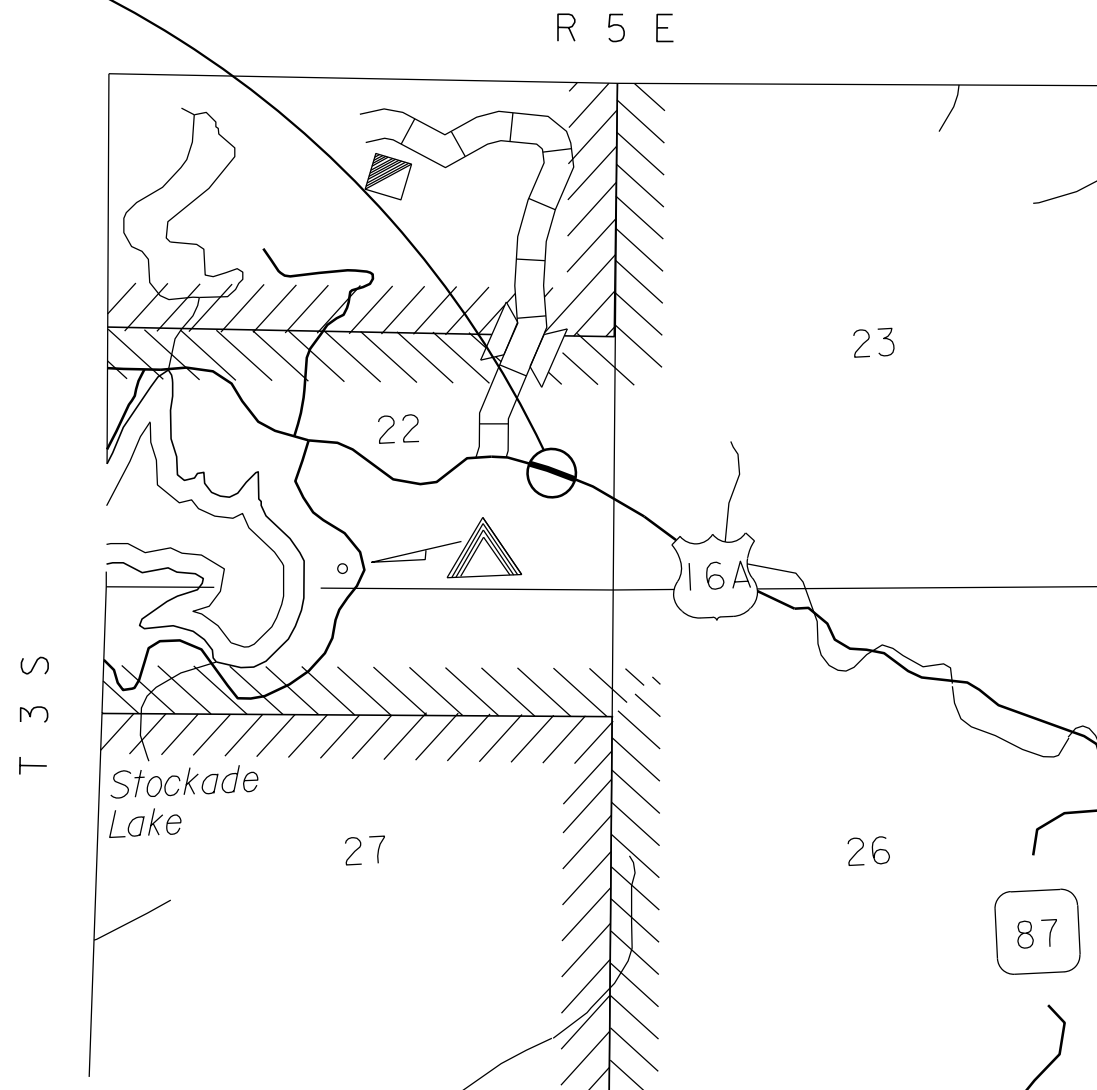
INDEX OF SHEETS

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Plot Scale - 1:200



**PROJECT
US Highway 16A
MRM 27.78**



STORM WATER PERMIT
None Required

Plotted From - trcs12608

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ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
320E1200	Asphalt Concrete Composite	27.8	Ton
332E0010	Cold Milling Asphalt Concrete	250	SqYd
633E1400	Pavement Marking Paint, 4" White	150	Ft
633E1405	Pavement Marking Paint, 4" Yellow	150	Ft
634E0010	Flagging	40.0	Hour
634E0110	Traffic Control Signs	106.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0640	Temporary Pavement Marking	75	Ft

SPECIFICATIONS

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

SEQUENCE OF OPERATIONS

1. Set up traffic control to close one lane.
2. Complete single lane mill and asphalt patching.
3. Switch traffic control to close adjacent lane.
4. Complete adjacent lane mill and asphalt patching.
5. Install Temporary Pavement Marking.
6. Install Permanent Pavement Marking.
7. Remove traffic control.

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and

the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived 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. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

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 shall 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 State ROW.

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

The waste disposal site(s) shall 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 Project Engineer.

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of 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 of time not to exceed the duration of the project. Prior to project completion, the waste shall 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) shall 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 designated option borrow sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: staging areas, borrow sites, waste disposal sites, and all material processing sites.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. 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; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on 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 shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). 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.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order 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 staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COLD MILLING ASPHALT CONCRETE

Loose material resulting from the cold milling shall be immediately picked up.

Cold Milling Asphalt Concrete shall be performed as shown in the centerline profile and as necessary at the limits of the project or at structures, so that the top mat of the new asphalt surfacing can match existing surface elevations.

The Los Angeles Abrasion Loss value on the aggregate used for the in place asphalt concrete was **26** percent. This value was obtained from testing during construction of the in place asphalt concrete.

Millings shall be treated as waste.

PROFILE ELEVATIONS

The Contractor shall use a fixed stringline to automatically control the elevation of the screed to match the centerline profile elevations provided in these plans.

ASPHALT CONCRETE COMPOSITE

Asphalt Concrete Composite shall be furnished by the Contractor.

Mineral Aggregate for Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E, Type 1 Asphalt Concrete Specifications.

SS-1h or CSS-1h Emulsified Asphalt for Tack shall be applied at the rate of 0.05 gallons per square yard.

The asphalt binder used in the mixture shall be PG 58-28, PG 64-22 or PG 64-28 Asphalt Binder.

Locations and quantities of asphalt repair are subject to change. The exact locations will be determined in the field by the Engineer. The Engineer reserves the right to adjust quantities and/or add locations at no additional cost to the state.

ASPHALT CROSS SLOPE TRANSITION

The new asphalt surfacing cross slope shall be transitioned along the length of the new surfacing, so that a bump or dip is not created. The percent cross slope change per foot shall be uniform along the length of the new asphalt surfacing. Below are the existing cross slopes:

	Left Lane (ft./ft.)	Right Lane (ft./ft.)	
-0+24	-0.01	-0.01	Match Existing Surfacing
0+26	0.00	0.00	Cattle Guard
0+37	0.00	0.00	Cattle Guard
0+61	0.01	0.00	Match Existing Surfacing

SURFACING THICKNESS DIMENSIONS

Plans tonnage will be applied even though the thickness may vary from that shown in the plans. At those locations where material must be placed to achieve a required elevation for smoothness, plans tonnage may be varied to achieve the required elevation.

TABLE OF ASPHALT CONCRETE REPAIR

Table of Asphalt Concrete Repair										
Station	to Station	Width (Ft)	Length (Ft)	Cold Milling Asphalt Concrete (SqYd)	Depth of Patch (Inches)	Asphalt Concrete Composite (Tons)	Temporary Pavement Marking (Ft)	Pavement Marking Paint, 4" Yellow (Ft)	Pavement Marking Paint, 4" White (Ft)	
-0+24	0+26	30	50	166.7	2	18.5	50	100	100	
0+37	0+62	30	25	83.3	2	9.3	25	50	50	
Total				250.0		27.8	75.0	150.0	150.0	

TRAFFIC CONTROL – GENERAL NOTES

1. Each construction work area shall be individually signed throughout the entire length of the construction work area.
2. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate 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. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.
3. Unless otherwise stated in these plans, no work will be allowed during hours of darkness.
4. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.
5. Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.
6. Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.
7. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.
8. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.
9. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.
10. All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.
11. All construction operations shall be conducted in the general direction of traffic movement.
12. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used, as determined by the Engineer.
13. At no time shall mainline traffic be exposed to differential elevations in traveling lanes due either to milling or paving operations. All lanes that are milled or paved shall be left closed until the adjacent lane is completed in a similar manner with no drop offs. All transitions shall be paved for a smooth ride as approved by the Engineer.

14. The Contractor shall repeat all applicable construction signing every 2 miles or as directed by the Engineer.
15. The Contractor shall keep the portion of the project being used by public traffic in a condition that will adequately and safely accommodate traffic.
16. Road Work Ahead (W20-1) signs shall be placed at applicable intersecting roads and as directed by the Engineer.
17. Traffic control shall not be removed until the uneven lane condition no longer exists.
18. 45 MPH (R2-1) shall be used only while workers are present.

PERMANENT PAVEMENT MARKINGS

All surfaces have existing markings and the Contractor is encouraged to review prior to bidding.

The pavement marking paint and glass beads shall be furnished and applied by the Contractor. All materials shall be applied as per manufacturer's recommendations.

PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

This material shall consist of a durable high build, low VOC, fast drying, waterborne traffic paint with a 100% acrylic polymer (DOW DT-400 or DOW HD-21A or equivalent) and with reflective media adhered to the paint. The reflective media shall consist of glass beads as well as bonded core reflective elements.

The bonded core reflective elements shall contain either clear or yellow tinted microcrystalline ceramic beads bonded to the outer surface. All microcrystalline ceramic beads bonded to reflective elements shall have a minimum index of refraction of 1.8 when tested using the liquid oil immersion method.

The Department will take retro-reflectivity 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 retro-reflectometer conforming to 30-meter geometry. Retro-reflectivity readings will be taken on a test location with cleaning being limited to light hand brooming.

Pavement markings not conforming to the Retro-reflectivity requirements shall be removed and replaced. If replacement of markings cannot be applied within the same year, the Contractor shall schedule subject work to be completed no later than June 15th in the following year. Upon replacement, the retro-reflectivity 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 retro-reflectivity readings will be taken at each test location. The three readings will be averaged and become the reading for that test location.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000N-491	4	10

Initial Readings (within 3 - 30 days of the line application):

<u>Pavement Marking Color</u>	<u>Minimum Value</u>
White	350 mcd/m2/lux
Yellow	275 mcd/m2/lux

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

RATES OF MATERIALS FOR HIGH GRADE POLYMER PAINT

Solid 4" Line = 27.8 Gals/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 shall be incidental to the contract unit price per gallon for Waterborne Pavement Marking Paint with High Grade Polymer, White or Yellow.

ITEMIZED LIST OF TRAFFIC CONTROL DEVICES

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16	32
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
G20-2	END ROAD WORK	2	36" x 18"	5	10
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS					106
SQFT					

TEMPORARY PAVEMENT MARKING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000N-491	5	10

Temporary Pavement Marking (Tabs) shall be used on the top lift of asphalt surfacing until permanent pavement marking is applied, and as directed by Engineer.

Temporary Pavement Marking (Tabs) shall be attached to the roadway surface with a flexible non-permanent bituminous adhesive capable of being removed from the roadway surface or with an adhesive approved by the Engineer.

The Temporary Pavement Marking (Tabs) shall be installed at 5-foot spacing and will be paid for at the contract unit price per foot per 4" line for both Yellow and White markers.

All costs for temporary pavement marking (Tabs) including furnishing, applying, uncovering, maintenance and removal shall be incidental to the contract unit price per foot for Temporary Pavement Marking.

TYPICAL SURFACING SECTION

US Highway 16A

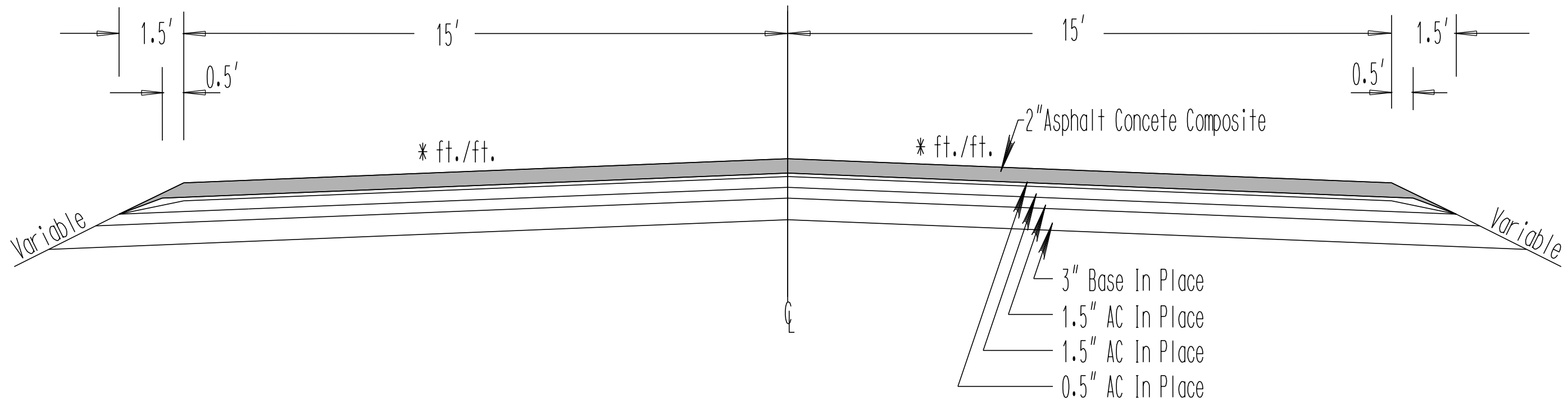
STATE OF SOUTH DAKOTA	PROJECT 000N-491	SHEET 6	TOTAL SHEETS 10
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Plotting Date: 05/19/2016

PLOT SCALE - 1:200

PLOT NAME - 2

* = As per table in plan notes



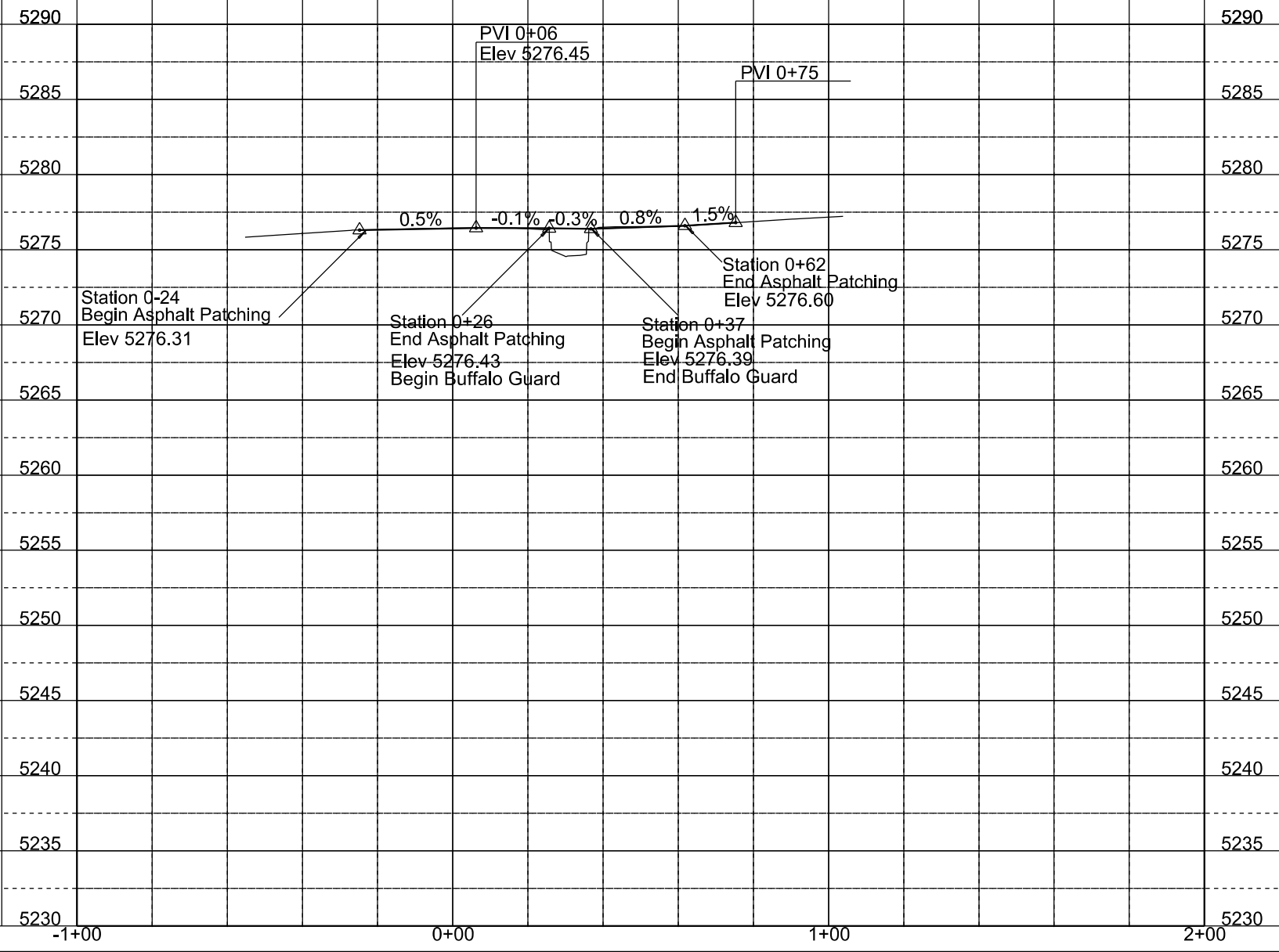
PLOTTED FROM - ITRC12608

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Cold Milling and Asphalt Resurfacing Profile

Plot Scale - 1:40

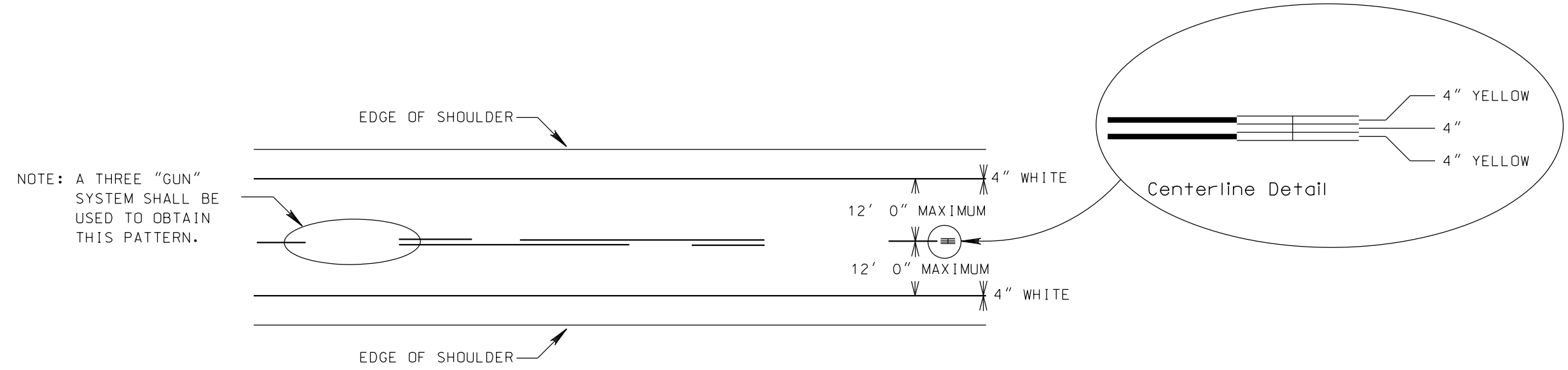
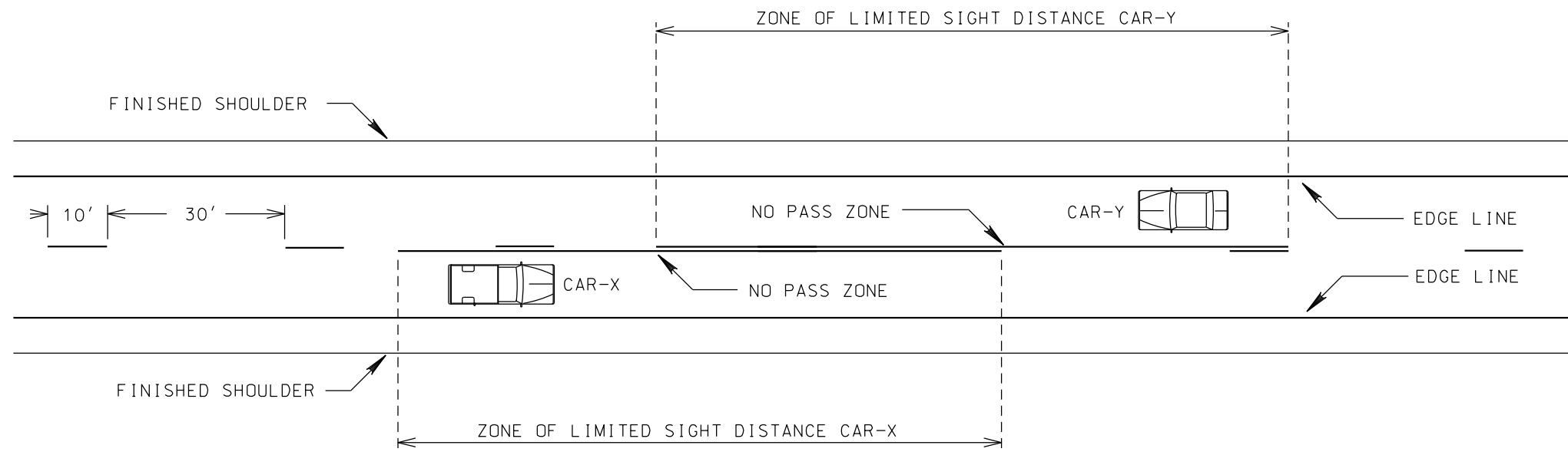
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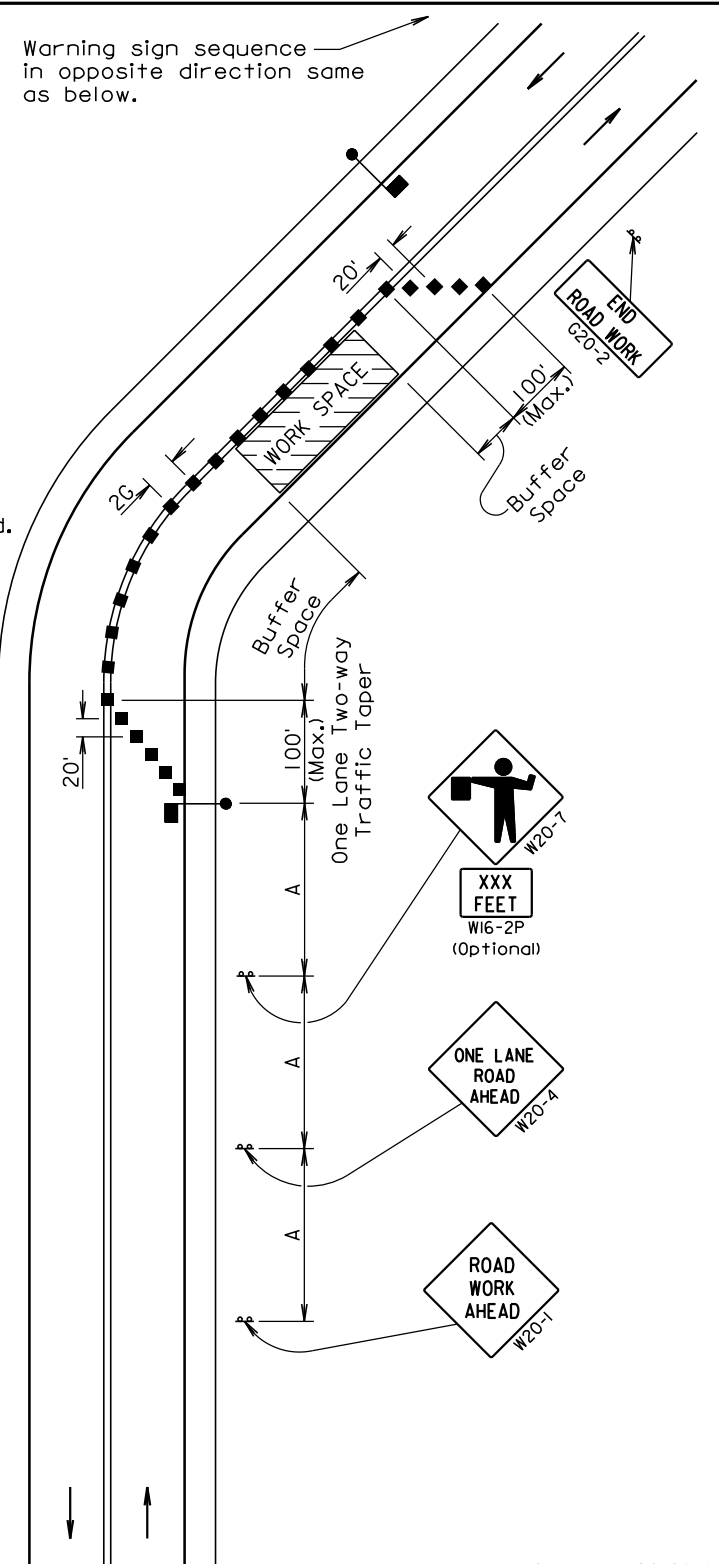
GENERAL PAVEMENT MARKING LAYOUT

STATE OF SOUTH DAKOTA	PROJECT 000N-491	SHEET 8	TOTAL SHEETS 10
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Plotting Date: 05/19/2016



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



Warning sign sequence in opposite direction same as below.

- 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.

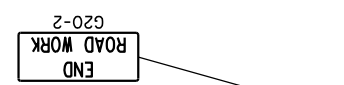
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall 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 shall 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.



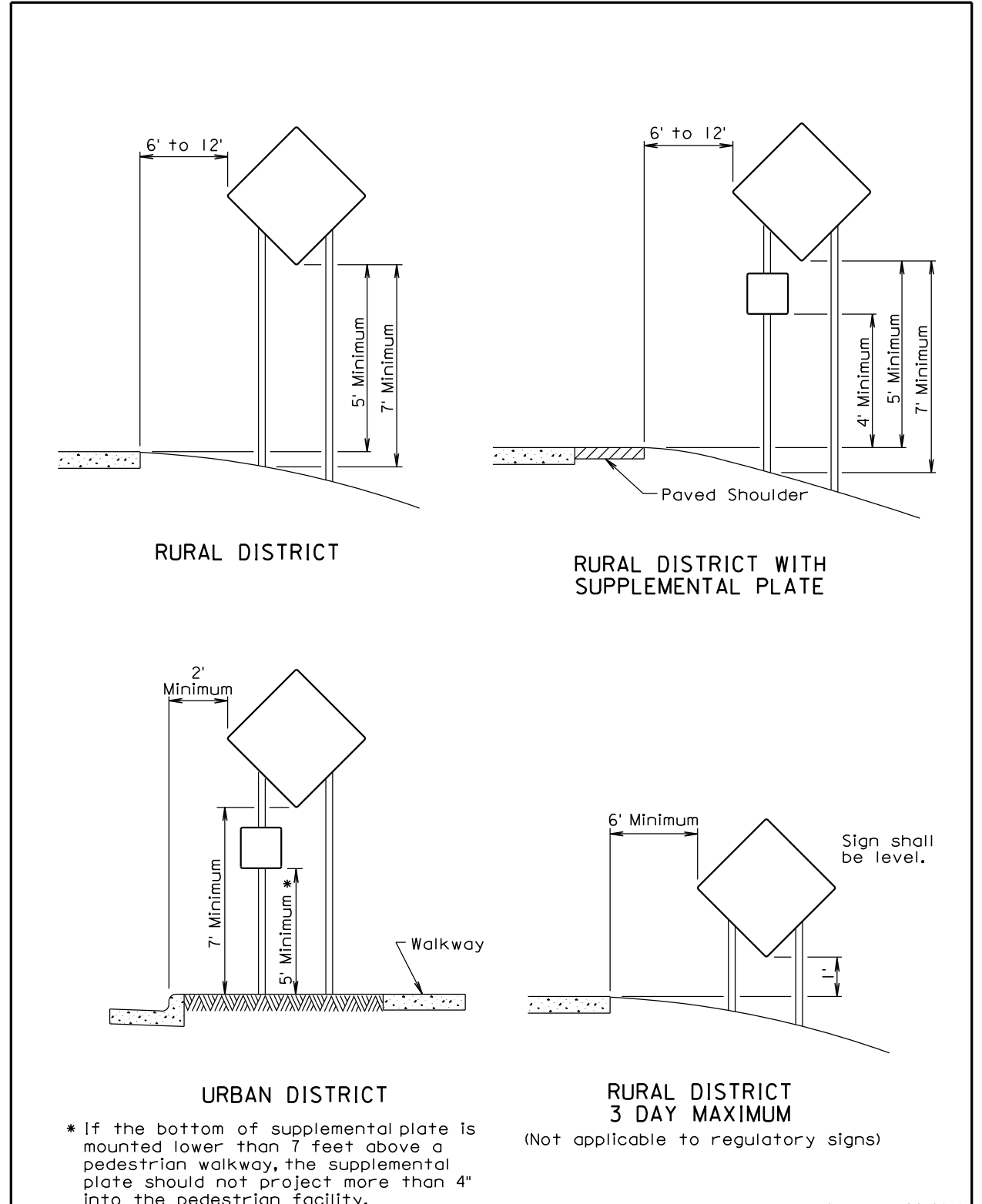
Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

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.

September 22, 2014

Published Date: 2nd Qtr. 2016	S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1



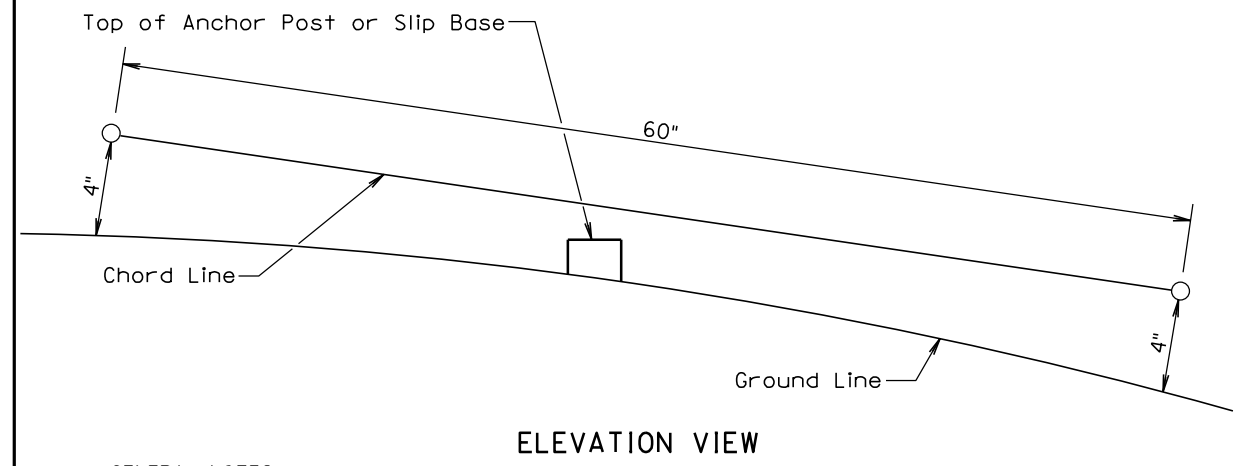
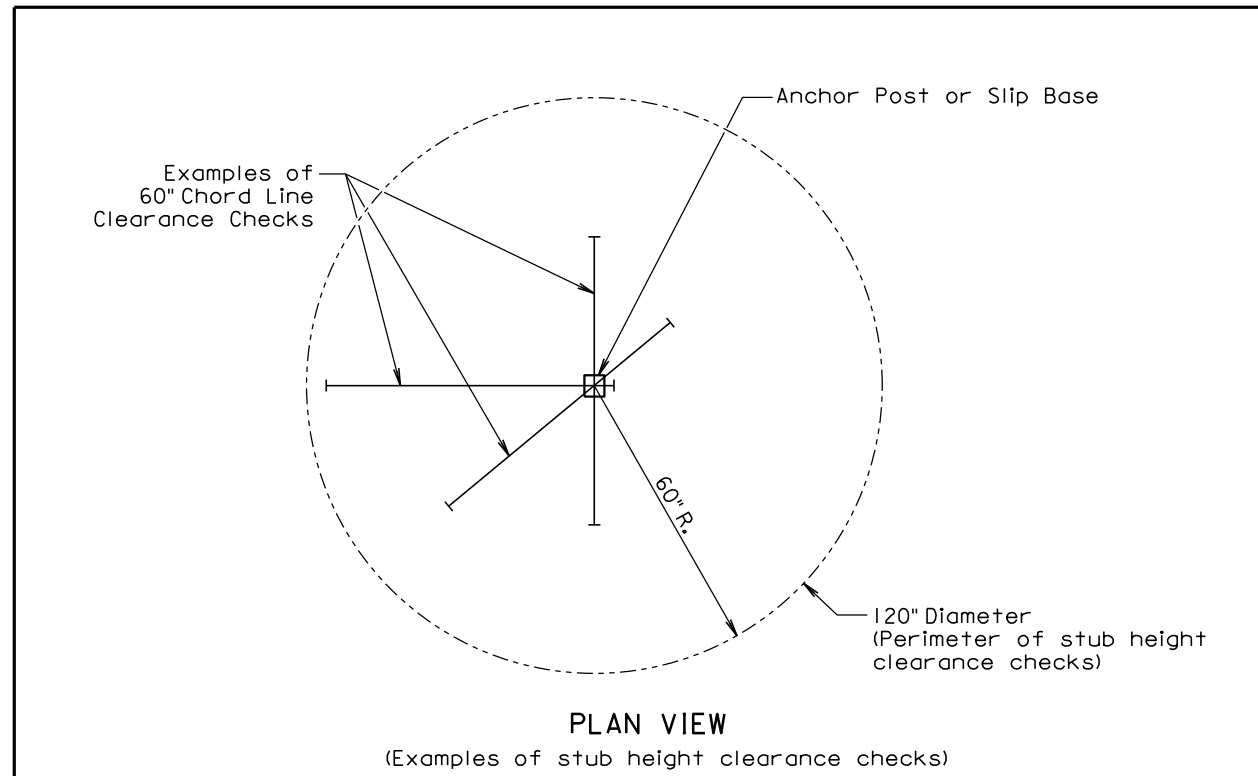
RURAL DISTRICT RURAL DISTRICT WITH SUPPLEMENTAL PLATE

URBAN DISTRICT RURAL DISTRICT 3 DAY MAXIMUM
(Not applicable to regulatory signs)

* 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.

September 22, 2014

Published Date: 2nd Qtr. 2016	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



GENERAL NOTES:

The top of anchor posts and slip bases SHALL 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 shall 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.

July 1, 2005

Published Date: 2nd Qtr. 2016	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1