

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED  
**PROJECT 019-271**  
**SD HIGHWAY 19**  
**TURNER COUNTY**

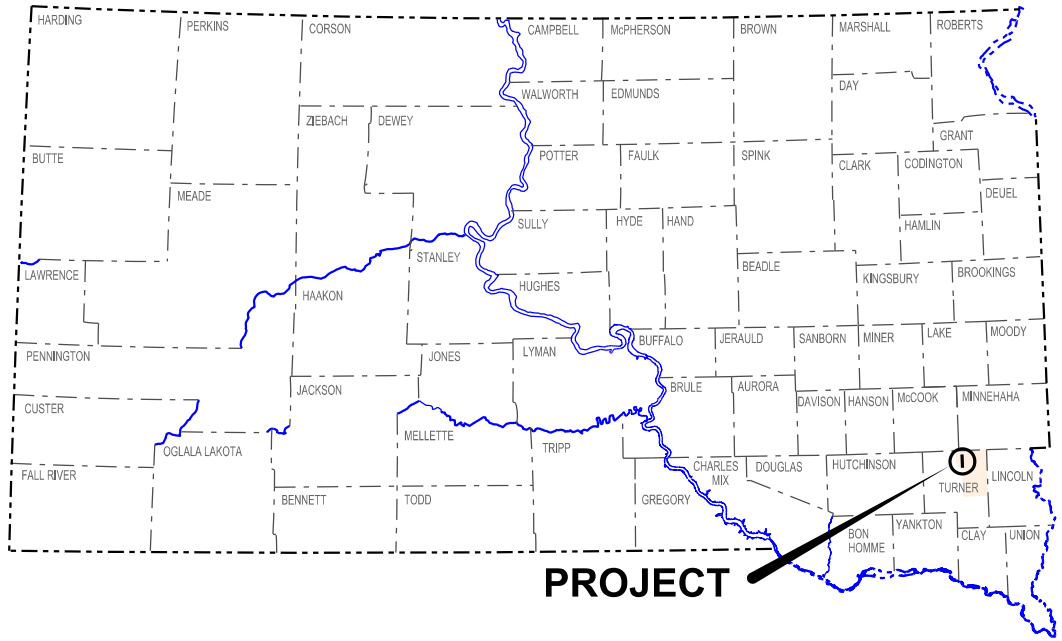
COLD MILLING ASPHALT CONCRETE,  
ASPHALT CONCRETE RESURFACING,  
PAVEMENT MARKING & GUARDRAIL  
PCN I3QP

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	1	25

Plotting Date: 04/24/2015

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PROJECT

**BEGIN PROJECT**  
STA. 307+12  
MRM 55.13 +0.137  
736.5' N of Begin Bridge,  
200' S of 275th Street

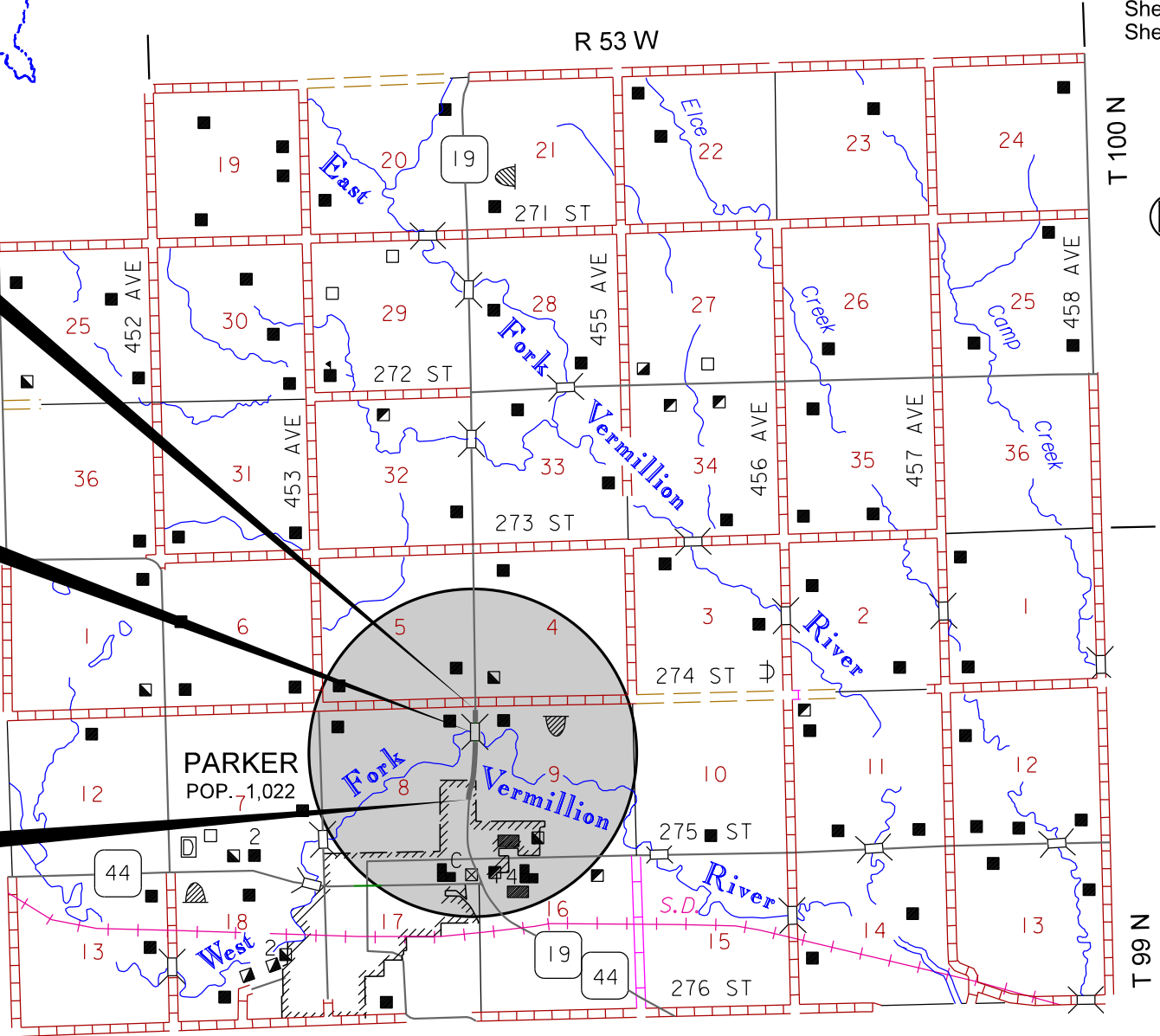
**STR. NO. 63-140-062**  
Sta. 314+39.5 to Sta. 315+65  
Continuous Concrete Bridge  
125'-6"=0.024 Mile  
MRM 55.13  
Two Approach Slabs  
2@20'=40' = 0.007 Mile

**END PROJECT**  
STA. 337+81  
MRM 54.17 +0.548  
2216' S of End Bridge at  
Begin Width Transition

DESIGN DESIGNATION	
ADT(2014)	1,565
ADT(2034)	1,686
DHV	219
D	51%
T DHV	4.2%
T ADT	9.2%
V	65 MPH

**STORM WATER PERMIT**  
(None required)

PROJECT LENGTH		
Gross Length:	3,069.0'	0.581 Mile
Bridges & Approach Slabs Length:	165.5'	0.031 Mile
Net Length:	2,903.5'	0.550 Mile



PLOT SCALE - 1"=660'

PLOTTED FROM - TRN130P.DGN

PLOT NAME - 1

FILE - ...TURN130P\TITLE130P.DGN

ESTIMATE OF QUANTITIES & ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	2	25

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0700	Remove 3 Cable Guardrail	148	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	2	Each
260E1010	Base Course	60.0	Ton
260E1050	Base Course, Salvaged Asphalt Mix	28.0	Ton
320E1200	Asphalt Concrete Composite	1,061.0	Ton
320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	1.1	Mile
332E0010	Cold Milling Asphalt Concrete	1,786	SqYd
629E0100	3 Cable Guardrail	230	Ft
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	2	Each
632E2220	Guardrail Delineator	18	Each
632E2510	Type 2 Object Marker Back to Back	2	Each
633E1300	Pavement Marking Paint, White	19.0	Gal
633E1305	Pavement Marking Paint, Yellow	6.0	Gal
634E0010	Flagging	70	Hour
634E0020	Pilot Car	20	Hour
634E0100	Traffic Control	782	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0630	Temporary Pavement Marking	1.2	Mile

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

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 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 pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

The Contractor shall not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

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.

COMMITMENT H: WASTE DISPOSAL SITE (CONTINUED)

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.

Cost 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 contract unit prices for the various 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.

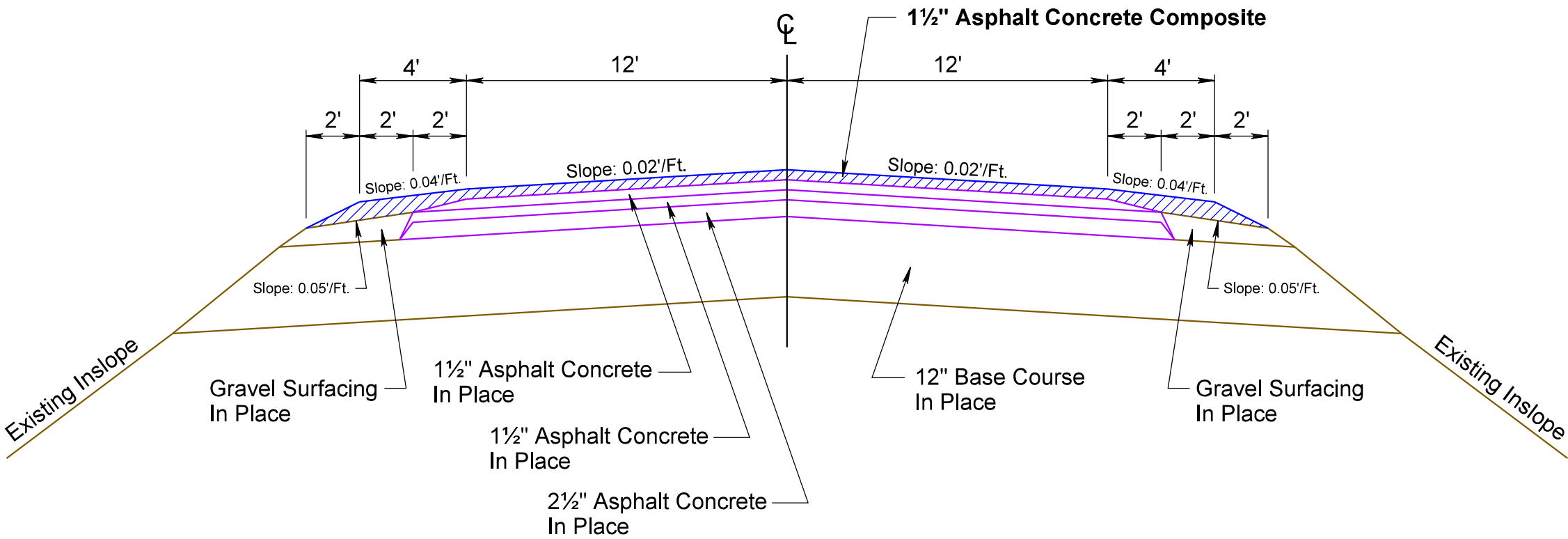
SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

# TYPICAL RESURFACING SECTION

SECTION 1  
307+12 to 312+39.5  
317+65 to 337+81

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	3	25

Plotting Date: 04/24/2015







RATES OF MATERIALS

Section 1  
Rural 2 Lane  
307+12.00 to 312+39.50  
317+65.00 to 337+81.00

The Estimate of quantities is based on the following quantities of materials per station.

1.5" ASPHALT CONCRETE COMPOSITE

Crushed Aggregate 37.07 Tons

MC-70Asphalt for Prime at the rate of 0.14 ton applied 10 feet wide (5 feet wide each shoulder)  
(Rate = 0.3 gallon per square yard).

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.09 ton applied 37 feet wide (Rate = 0.05 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.09 ton applied 36 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 1.07 tons applied 24 feet wide (Rate = 8 pounds per square yard).

RATES OF MATERIALS

Section 2  
Rural 2 Lane - Between Guardrail  
312+39.50 to 317+65.00  
(less 125.5' for one bridge &  
less 40' for two approach slabs)

The Estimate of quantities is based on the following quantities of materials per station.

1.5" ASPHALT CONCRETE COMPOSITE

Crushed Aggregate 29.60 Tons

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.08 ton applied 33 feet wide (Rate = 0.05 gallon per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 0.09 ton applied 36 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 1.07 tons applied 24 feet wide (Rate = 8 pounds per square yard).

TABLE OF PROJECT STATIONING

SECTION	STATION TO	STATION	DESCRIPTION	LENGTH	GROSS SECTION LENGTHS	EXCEPTION LENGTHS (APPR SLABS)	BRIDGE LENGTHS	NET SECTION LENGTHS
1	307+12.00 to	312+39.50	Rural 2 Lane	527.50'	2543.50'			2543.50' 0.482 mi.
	317+65.00 to	337+81.00		2016.00'				
2	312+39.50 to	317+65.00	Rural 2 Lane - Betw een Guardrail	525.50'	525.50'	20.00' 20.00'	125.50'	360.00' 0.068 mi.
Totals					3069.00'	0.581 mi. 40.00'	0.008 mi. 125.50'	0.024 mi. 2903.50' 0.550 mi.

TABLE OF MATERIALS QUANTITIES

SECTION	BASE COURSE	BASE COURSE SALVAGED ASPHALT MIX	COLD MILLING ASPHALT CONCRETE	ASPHALT CONCRETE COMPOSITE	MC-70 ASPH. FOR PRIME N.A.B.I.	SS-1h/ CSS-1h ASPH. FOR TACK N.A.B.I.	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL N.A.B.I.	SAND FOR FLUSH SEAL N.A.B.I.
	Ton	Ton	SqYd	Ton	Ton	Ton	Ton	Ton
1	-	-	-	943	3.6	2.3	2.3	27
2	-	-	-	107	-	0.3	0.3	4
Subtotals:	-	-	-	1050	3.6	2.6	2.6	31
Additional Quantities:	60	28	1786	11	-	-	-	-
Totals:	60	28	1786	1061	3.6	2.6	2.6	31

N.A.B.I. = Not A Bid Item

Cost for shall be included in the contract unit price per ton for Asphalt Concrete Composite.

TABLE OF ADDITIONAL QUANTITIES

LOCATION	BASE COURSE	BASE COURSE SALVAGED ASPHALT MIX	COLD MILLING ASPHALT CONCRETE	ASPHALT CONCRETE COMPOSITE
	Ton	Ton	SqYd	Ton
Shoulder Transitions				
Sec. 1 312+09.5 L to 312+39.5 L 0' to 2'	-	1	-	0.5
Sec. 1 317+65 R to 317+95 R 2' to 0'	-	1	-	0.5
Begin/End Project	-	-	506	-
Begin/End Approach Slabs	-	-	1280	-
Guardrail Locations				
See Guardrail Table	-	26	-	10
Pads				
2 Farm Entrances	20	-	-	-
4 Field Entrances	40	-	-	-
TOTALS:	60	28	1786	11

NOTES: The tonnage shown above for Base Course is based on a compacted depth of 2 inches.  
The tonnage shown above for Base Course Salvaged Asphalt Mix is based on a compacted depth of 4 inches.  
The tonnage shown above for Asphalt Concrete Composite is based on a compacted depth of 1½ inches.

The above quantities are included in the Estimate of Quantities.

N.A.B.I. = Not A Bid Item

TABLE FOR REMOVAL AND INSTALLATION OF GUARDRAIL AND RELATED ITEMS

LOCATION	REMOVE 3 CABLE GUARDRAIL	REMOVE 3 CABLE GUARDRAIL ANCHOR ASSEMBLY	BASE COURSE SALVAGED ASPHALT MIX	ASPHALT CONCRETE COMPOSITE	3 CABLE GUARDRAIL	3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY
BRIDGE CORNER	Ft	Each	Ton	Ton	Ft	Each
STR.NO. 63-140-062						
MRM 55.13						
Begin Bridge L	-	-	2	1	-	-
Begin Bridge R	74	1	11	4	115	1
End Bridge L	74	1	11	4	115	1
End Bridge R	-	-	2	1	-	-
TOTALS:	148	2	26	10	230	2

TABLE OF GUARDRAIL DELINEATORS & OBJECT MARKERS

LOCATION	TYPE 2 OBJECT MARKER BACK TO BACK	TYPE 2 OBJECT MARKER	GUARDRAIL TERMINAL END OBJECT MARKER (ADHESIVE)	GUARDRAIL DELINEATOR			
			N.A.B.I.	BEAM		CABLE	
			<div>E</div> #	<div>B</div> #		<div>C</div> #	
BRIDGE CORNER	LANE-SHOULDER			Yellow	White	Yellow	White
STR.NO. 63-140-062							
MRM 55.13							
Begin Bridge L			1		4		
Begin Bridge R	1		1		2		3
End Bridge L	1		1		2		3
End Bridge R			1		4		
TOTALS	2	-	4	-	12	-	6
# - For KEY, Refer to Standard Plate 632.40 - Sheet 1 of 4.				18			

N.A.B.I. = Not A Bid Item - Cost is incidental to the contract unit prices for the various items.

UTILITIES

The Contractor shall contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It shall be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the Contractor shall contact the Project Engineer to determine modifications that will be necessary to avoid utility impacts.

SURFACING THICKNESS DIMENSIONS

Plans tonnage will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans tonnage may be varied to achieve the required elevation.

INTERSECTING ROADS AND ENTRANCES

Intersecting roads and entrances shall be satisfactorily cleared of vegetation, shaped and compacted prior to placement of mainline surfacing. This work will be considered incidental to other contract items. Separate measurement and payment will not be made.

SHOULDER WORK

Prior to construction, Department of Transportation Maintenance Forces will spray the shoulders to kill existing vegetation. It is the Contractor's responsibility to notify the State a minimum of thirty days prior to starting work on the surface of the highway. The State assumes no responsibility for the effectiveness of the herbicide applied.

Vegetation and accumulated material on or adjacent to the existing roadway edge shall be removed to the satisfaction of the Engineer prior to asphalt concrete resurfacing. Any remaining windrow of accumulated material shall be spread evenly on the inslope adjacent to the asphalt shoulder, to the satisfaction of the Engineer, following application of the flush seal.

Shoulder work shall be incidental to other contract items. Separate measurement and payment will not be made.

BASE COURSE

Material obtained from Cold Milling Asphalt Concrete operations may be used as Base Course. However, if milled material is used, it must first be blended 50/50 with virgin Base Course at no additional cost for the blending.

BASE COURSE, SALVAGED ASPHALT MIX

Material obtained from Cold Milling Asphalt Concrete operations shall be used as Base Course, Salvaged Asphalt Mix as specified on the layout for Installation of Guardrail.

WATER FOR COMPACTION

Cost for water for compaction of the Base Course and Base Course, Salvaged Asphalt Mix shall be incidental to the contract unit prices for the various contract items. The moisture required at the time of compaction will be 6%± unless otherwise directed by the Engineer.

COLD MILLING ASPHALT CONCRETE

Cold Milling is estimated to produce 138 tons of salvaged asphalt concrete material. Approximately 28 tons will be reused as Base Course, Salvaged Mix. Remaining unused material shall become the property of the Contractor. Estimated quantities are for information purposes only and the exact quantity will be determined upon construction. No allowance will be made for loss of expected reimbursement or loss of anticipated profit.

Cold Milling Asphalt Concrete operations ahead of asphalt concrete laydown will be limited by particular job conditions and will be subject to approval of the Engineer. In no case shall cold milling operations ahead of asphalt concrete laydown operations exceed seven calendar days.

The requirement for a traveling stringline shall be waived.

If resurfacing as per the typical section cannot be placed immediately after cold milling at the project ends, and at bridge approach slabs then temporary asphalt mix ramps shall be placed as directed by the Engineer. Cost for placing and removing the temporary ramps shall be incidental to the contract unit prices for the various items.

COLD MILLING TAPERS

In order to construct the new surfacing flush with the asphalt concrete, it will be necessary to taper the depth of milling according to the details for Cold Milling Tapers.

Cost for this work shall be included in the contract unit price per square yard for Cold Milling Asphalt Concrete.

Taper depth of Cold Milling at locations shown below:

STA	TO STA.	LOCATION	SIZE	SQYDS
307+12	to 307+72	Begin Project	60' L x 38' W *	253
312+39.5	to 314+19.5	Begin Appr. Slab	180' L x 32' W	640
315+85	to 317+65	End Appr. Slab	180' L x 32' W	640
337+21	to 337+81	End Project	60' L x 38' W *	253
TOTAL:				1,786

\* Includes granular shoulder width to provide room for resurfacing.

SAWING IN EXISTING SURFACING

Where new asphalt concrete is placed adjacent to existing asphalt concrete or concrete pavement, the existing asphalt concrete or concrete pavement shall be sawed full depth to a true line with a vertical face. No separate payment will be made for sawing.

FLUSH SEAL

Application of the flush seal shall be completed within 10 working days following completion of the asphalt concrete resurfacing.

ASPHALT CONCRETE COMPOSITE

Virgin mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements for Class E, Type 1.

The asphalt binder used in the mixture shall be PG 58-34, PG 64-28 or PG 64-34 Asphalt Binder.

All other requirements in the specifications for Asphalt Concrete Composite shall apply.

RUMBLE STRIPES

INSTALLATION:

Rumble stripes shall be constructed according to the details of Standard Plate 320.20.

Rumble stripes shall be installed in rural areas with posted speeds greater than 50 mph and are not required in urban areas. The rumble stripes shall begin at the location of the Speed Limit 65 sign as traffic is departing the built up area of a community, unless otherwise specified in the plans. The Engineer shall provide the exact start and stop locations.

Rumble stripes shall not be installed on bridge decks, through curb & gutter sections, through mailbox turnouts, through intersecting roads or through approaches. They also shall not be placed within 50 feet of any railroad crossing.

Gaps for rumble stripes installation as detailed on the standard plates are included with the measurement and payment.

Cost for asphalt concrete rumble stripes shall be included in the contract unit price per mile for Grind 8" Rumble Strip or Stripe in Asphalt Concrete.

ROADWAY CLEANING:

The Contractor shall be required to remove loose material from the driving surface and/or asphalt shoulders of the roadway. Loose material may be broomed to the edge of shoulders. It shall be the Contractor's responsibility to ensure the loose material does not enter any vegetated areas or waterways.

Cost for this work shall be incidental to the contract unit price per mile for Grind 8" Rumble Strip or Stripe in Asphalt Concrete.

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**TEMPORARY PAVEMENT MARKING**

The total length of no passing zone on this project is estimated to be 0.241 mile.

It is estimated that 2 DO NOT PASS signs will be required to mark the no passing zones, should the Contractor elect to use these signs.

Use of DO NOT PASS signs will be allowed for a two week duration.

Cost for furnishing, installing and removing the DO NOT PASS signs shall be incidental to the contract unit price per mile for Temporary Pavement Marking.

Temporary road markers shall be required on the top lift of asphalt surfacing. The Contractor shall remove and dispose of them after Permanent Pavement Marking is applied. Method of removal shall be nondestructive to the road surface and shall be accomplished within one week of completion of the Permanent Pavement Marking.

Two applications of temporary pavement marking are included in the estimate of quantities for completion of the asphalt lift and uncovering the temporary road markers after application of the seal. Additional quantity is included for application on the milled surface areas.

Cost for furnishing, applying, uncovering, removing and disposing of the temporary road markers shall be included in the contract unit price per mile for Temporary Pavement Marking.

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

Cost for the traffic control to install and remove the temporary road markers shall be incidental to the contract unit price per mile for Temporary Pavement Marking.

**PERMANENT PAVEMENT MARKING**

The Region Traffic Engineer shall be notified a minimum of 2 weeks prior to the application of the permanent pavement marking to allow determination of the location of no passing zones. No work that obstructs the traveled way or roadway shoulders will be in progress at the time of the determination of the no passing zones.

Application of permanent pavement marking shall be completed within 14 days following completion of the final surfacing.

**GENERAL MAINTENANCE OF TRAFFIC**

Removing, relocating, covering, salvaging and resetting of permanent traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to 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.

The Contractor shall provide documentation that all breakaway sign supports comply with FHWA NCHRP 350 or MASH crash-worthy requirements. The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

Sufficient traffic control devices have been included in these plans to sign one workspace.



PAVEMENT MARKING

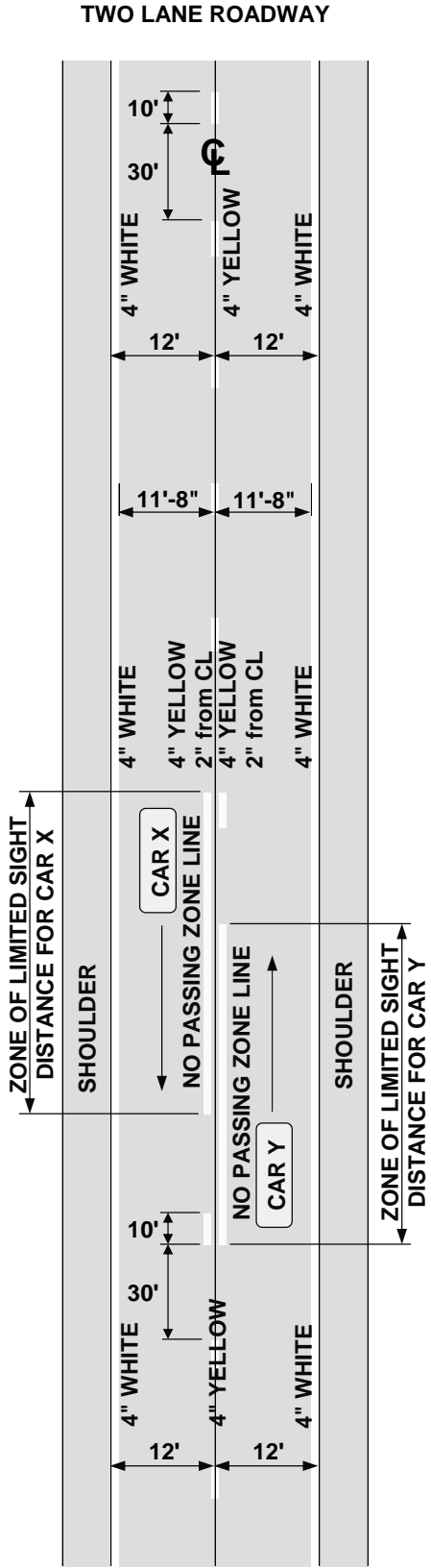
Typical pavement marking as shown on this sheet shall be applied throughout the entire length of two lane roadway.

Traffic Control shall be incidental to the cost of application. The striper and advance or trailing warning vehicle shall be equipped with flashing amber lights and advance warning arrow panel.

Application rates shall be as follows:

Two Lane Roadway (Rates for one line)
Dashed Yellow Centerline Rate = 4.6 Gals./Pass-Mile
Solid Yellow Centerline Rate = 16.9 Gals./Pass-Mile
Solid White Edgeline Rate = 16.9 Gals./Pass-Mile
Glass Beads = 8 Lbs./Gal.

ESTIMATED QUANTITIES	
PAINT	QUANTITY
WHITE	19 GALLONS
YELLOW	6 GALLONS



Additional Quantities

Rates of Coverage:	SqFt/Gal
4", 8" and 12" Lines -	80
24" Lines and Bars -	50
Arrows, Messages and Solid Areas -	30

**NOTE:** All pavement marking dimensions are based on 12' driving lanes.

ITEMIZED LIST FOR TRAFFIC CONTROL

		CONVENTIONAL ROAD			
SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
R1-1	STOP		30" x 30"	21	
R1-2	YIELD		36" x 36"	27	
R2-1	SPEED LIMIT __		24" x 30"	18	
R2-6aP	FINES DOUBLE (plaque)		24" x 18"	15	
R4-7	KEEP RIGHT (symbol)		24" x 30"	18	
R5-1	DO NOT ENTER		30" x 30"	21	
R5-1a	WRONG WAY		36" x 24"	20	
R10-6	STOP HERE ON RED		24" x 36"	20	
R11-2	ROAD CLOSED		48" x 30"	27	
R11-3a	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		60" x 30"	30	
R11-4	ROAD CLOSED TO THRU TRAFFIC		60" x 30"	30	
W1-1	LEFT or RIGHT TURN ARROW		48" x 48"	34	
W1-2	LEFT or RIGHT CURVE ARROW		48" x 48"	34	
W1-3	REVERSE TURN (L or R)		48" x 48"	34	
W1-4	REVERSE CURVE (L or R)		48" x 48"	34	
W3-1	STOP AHEAD (symbol)		48" x 48"	34	
W3-2	YIELD AHEAD (symbol)		48" x 48"	34	
W3-3	SIGNAL AHEAD (symbol)		48" x 48"	34	
W3-4	BE PREPARED TO STOP	2	48" x 48"	34	68
W3-5	SPEED REDUCTION AHEAD (__ MPH)		48" x 48"	34	
W4-1	MERGE (symbol)		48" x 48"	34	
W4-2	LEFT or RIGHT LANE ENDS (symbol)		48" x 48"	34	
W4-3	ADDED LANE (symbol)		48" x 48"	34	
W5-3	ONE LANE BRIDGE		48" x 48"	34	
W7-3aP	NEXT __ MILES (plaque)		36" x 30"	23	
W8-1	BUMP	4	48" x 48"	34	136
W8-6	TRUCK CROSSING	2	48" x 48"	34	68
W8-7	LOOSE GRAVEL		48" x 48"	34	
W8-11	UNEVEN LANES	2	48" x 48"	34	68
W8-17	SHOULDER DROP-OFF (symbol)		48" x 48"	34	
W8-17P	SHOULDER DROP-OFF (plaque)		30" x 24"	18	
W13-1P	ADVISORY SPEED (plaque)		30" x 30"	21	
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
W20-2	DETOUR AHEAD		48" x 48"	34	
W20-3	ROAD CLOSED AHEAD		48" x 48"	34	
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	34	68
W20-5	LEFT or RIGHT LANE CLOSED AHEAD		48" x 48"	34	
W20-7	FLAGGER (symbol)	2	48" x 48"	34	68
W21-1	WORKERS (symbol)		48" x 48"	34	
W21-2	FRESH OIL	2	48" x 48"	34	68
W21-3	ROAD MACHINERY AHEAD	2	48" x 48"	34	68
W21-5	SHOULDER WORK	2	48" x 48"	34	68
W21-5a	LEFT or RIGHT SHOULDER CLOSED		48" x 48"	34	
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD		48" x 48"	34	
G20-1	ROAD WORK NEXT __ MILES		36" x 18"	17	
G20-2	END ROAD WORK	2	36" x 18"	17	34
G20-5aP	WORK ZONE (plaque)		24" x 18"	15	
-	TYPE III OBJECT MARKER		12" x 36"	15	
-	TYPE 3 BARRICADE - 8' single sided			40	
-	TYPE 3 BARRICADE - 8' double sided			56	
		TOTAL UNITS 782			

MOBILE OPERATIONS ON TWO-LANE ROAD  
(TYPICAL)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	10	25

Plotting Date: 04/17/2015

Notes for Mobile Operations on Two-lane Road (Typical)

Standard:

1. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.
2. Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.
3. If an arrow board is used, it shall be used in the caution mode.

Guidance:

4. Where practical and when needed, the work and shadow vehicles should pull over periodically to allow vehicular traffic to pass.
5. Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance from the work vehicle and proceed at the same speed. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.
6. The shadow vehicles should also be equipped with two high-intensity flashing lights mounted on the rear, adjacent to the sign.

Option:

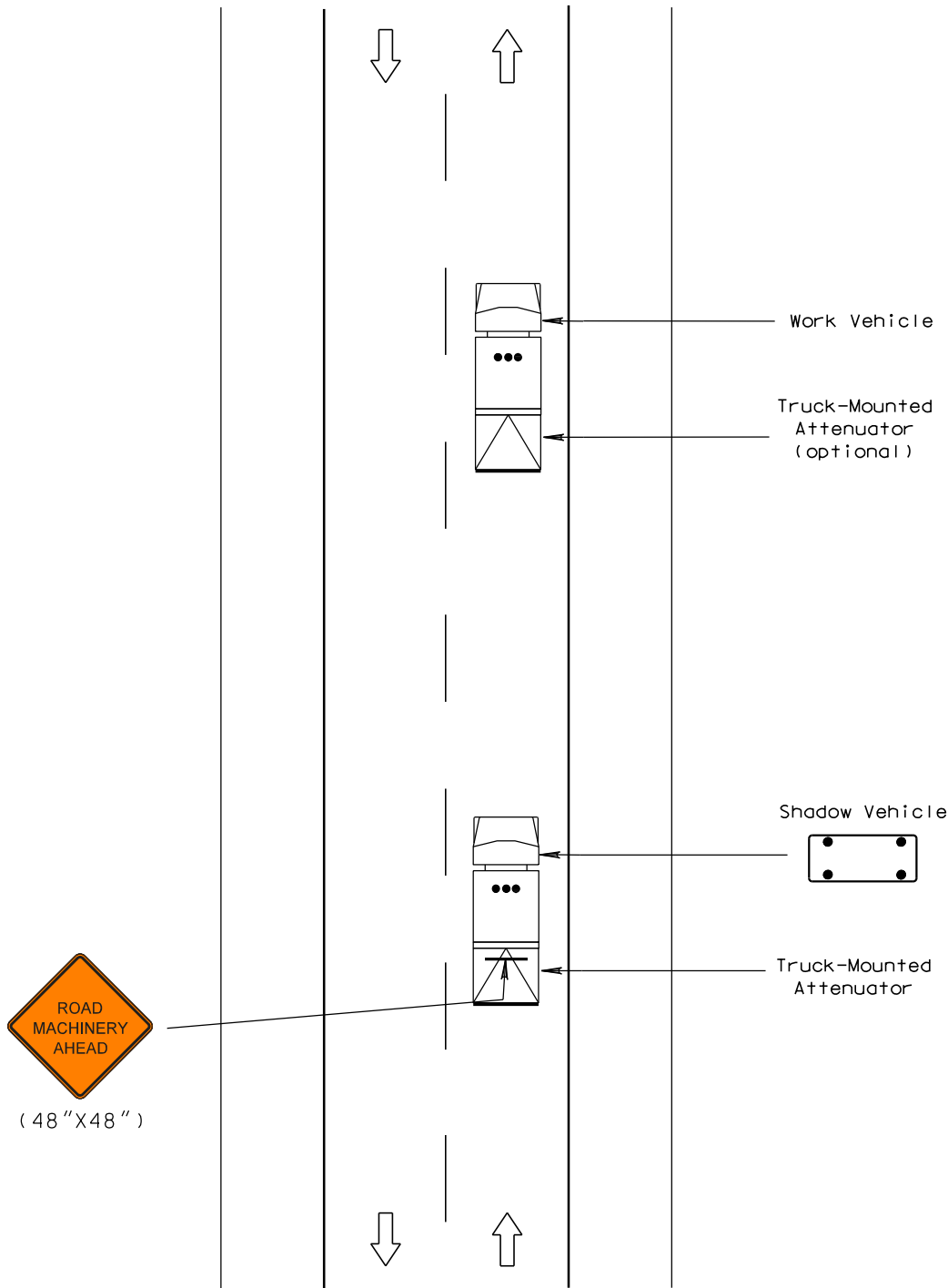
7. The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.
8. Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. Law enforcement vehicles may be used for this purpose.
9. A truck-mounted attenuator may be used on the shadow vehicle or on the work vehicle.
10. If the work and shadow vehicles cannot pull over to allow vehicular traffic to pass frequently, a DO NOT PASS sign may be placed on the rear of the vehicle blocking the lane.

Support:

11. Shadow vehicles are used to warn motor vehicle traffic of the operation ahead.

Standard:

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



MOBILE OPERATIONS ON TWO-LANE ROAD

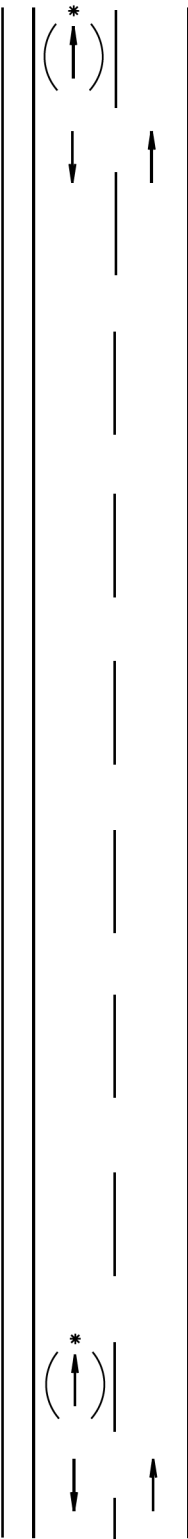
The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

\* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

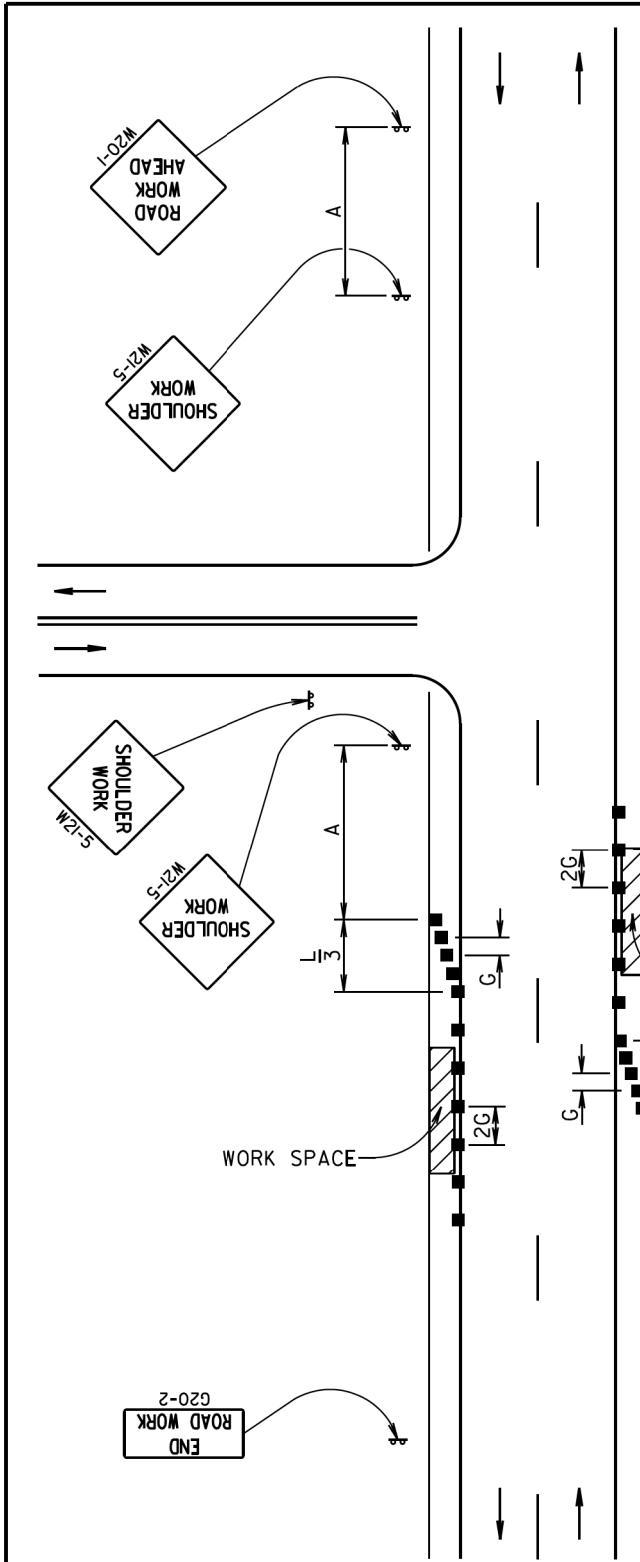
For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.



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 - 75	1000

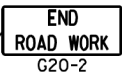


July 1, 2005



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 - 50	500	600	50
55	750	660	50
60 - 65	1000	780	50

Channelizing Device



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

For short duration operations (1 hour or less) all channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Worker signs (W21-1 or W21-1a) may be used instead of SHOULDER WORK signs.

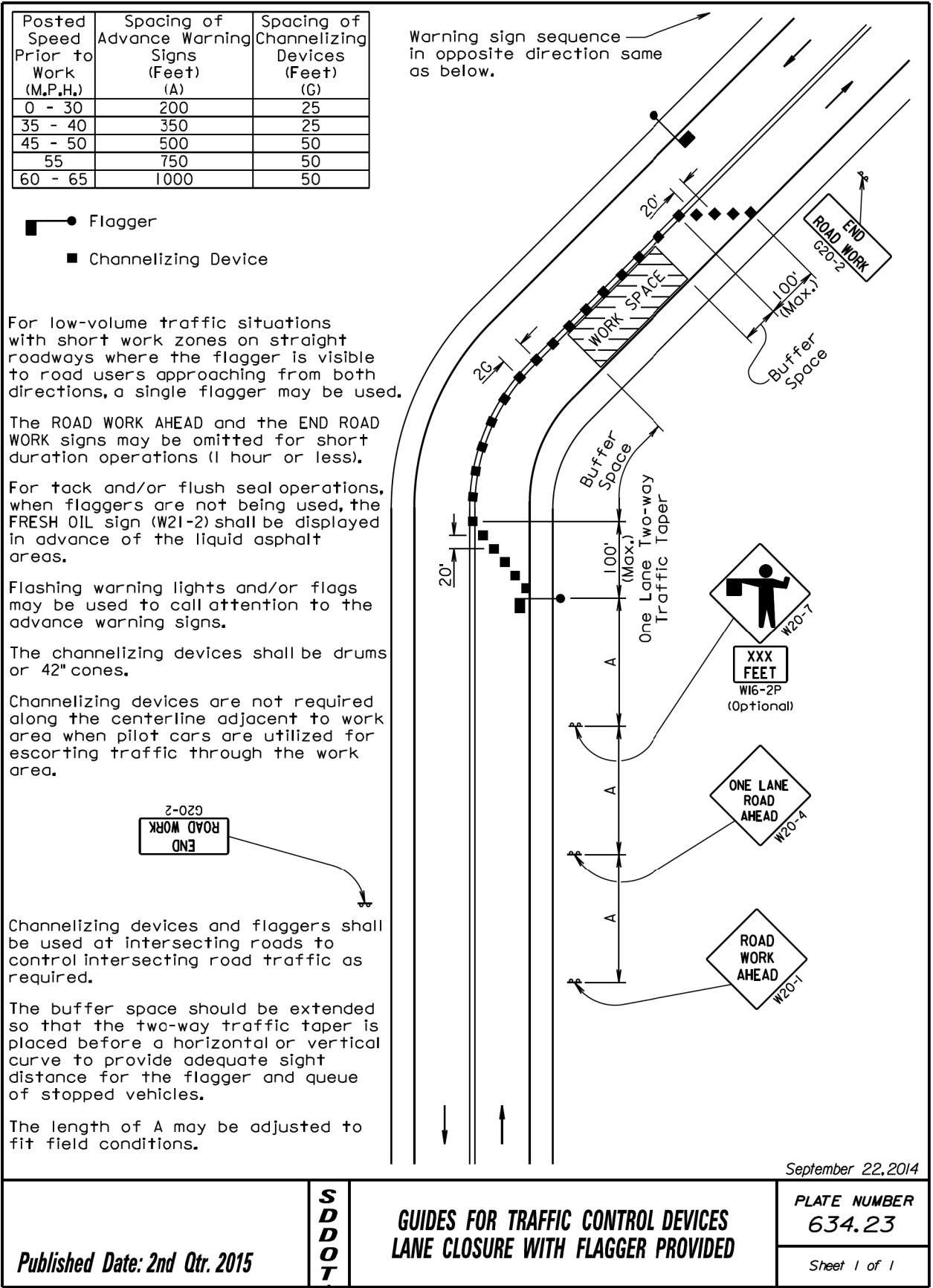
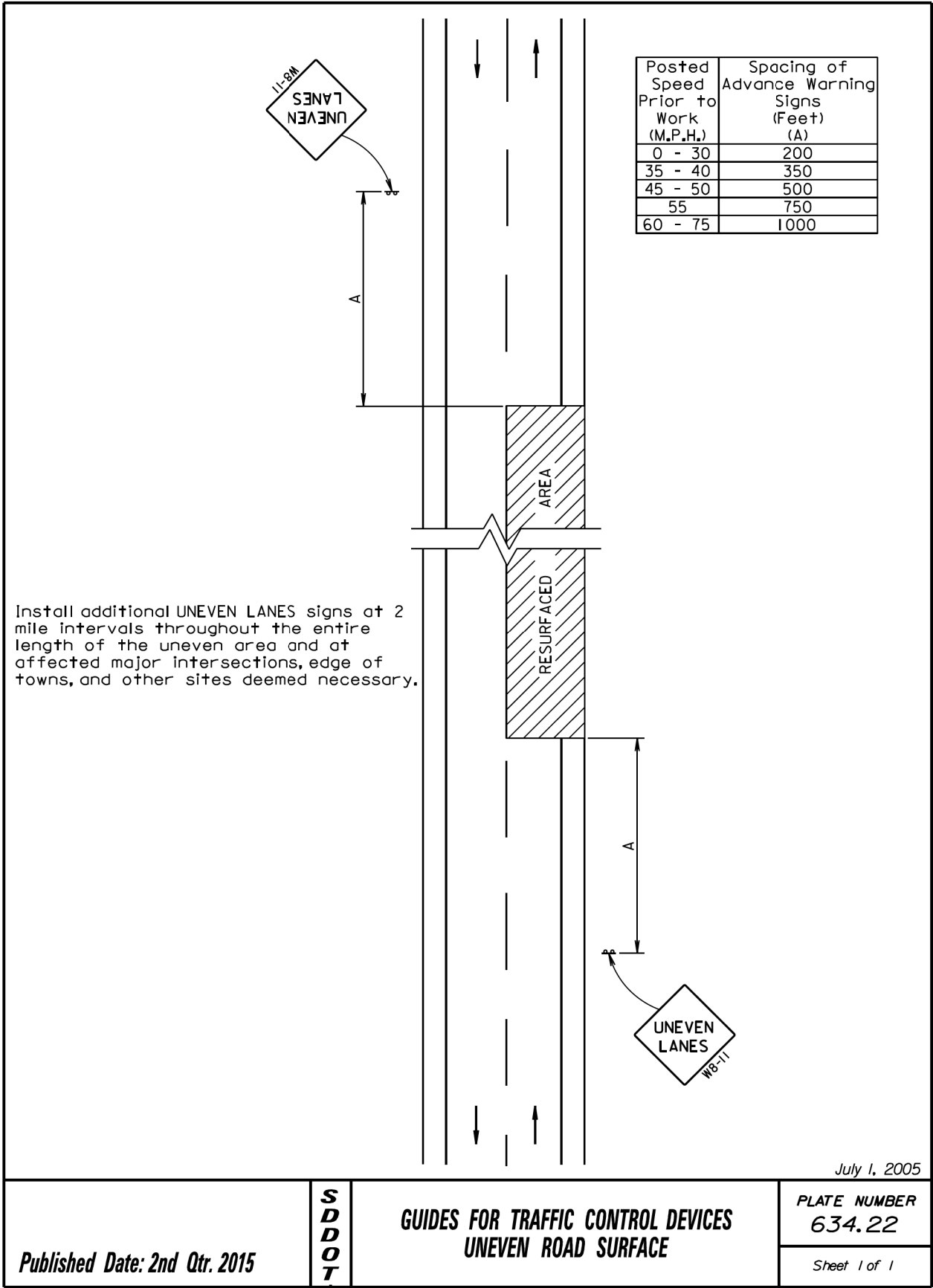
A SHOULDER WORK sign should be placed on the left side of a divided or one-way roadway only if the left shoulder is affected.

The SHOULDER WORK sign on an intersecting roadway is not required if drivers emerging from that roadway will encounter another advance warning sign before they reach a work activity area.

WORK SPACE



September 22, 2014







PLOT SCALE - 1:200

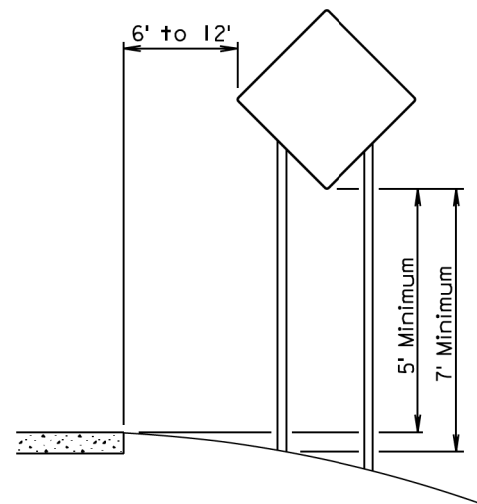
PLOTTED FROM - TRM11115

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	14	25

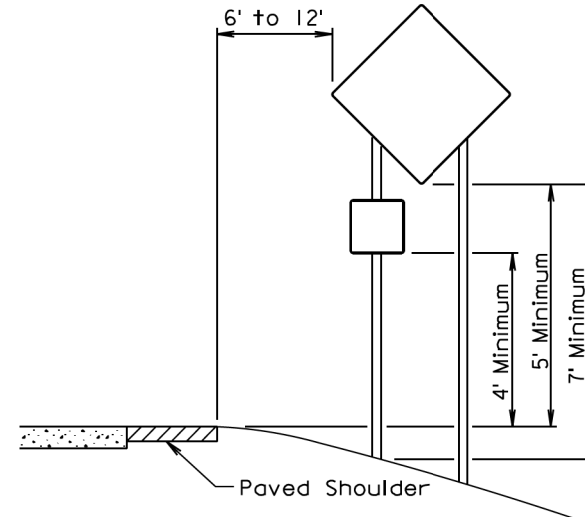
Plotting Date: 04/17/2015

PLOT NAME - 4

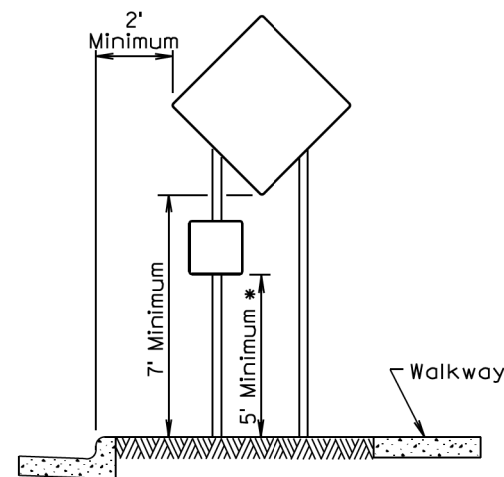
FILE - ... \TC STD PLATES 130P.DGN



RURAL DISTRICT

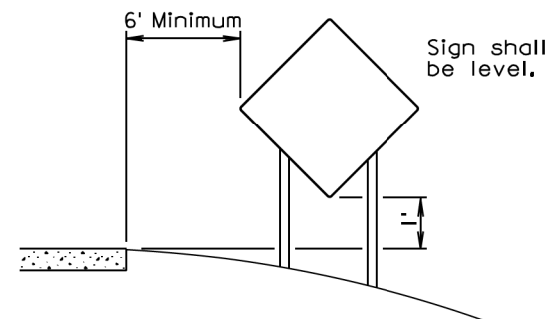


RURAL DISTRICT WITH  
SUPPLEMENTAL PLATE



URBAN DISTRICT

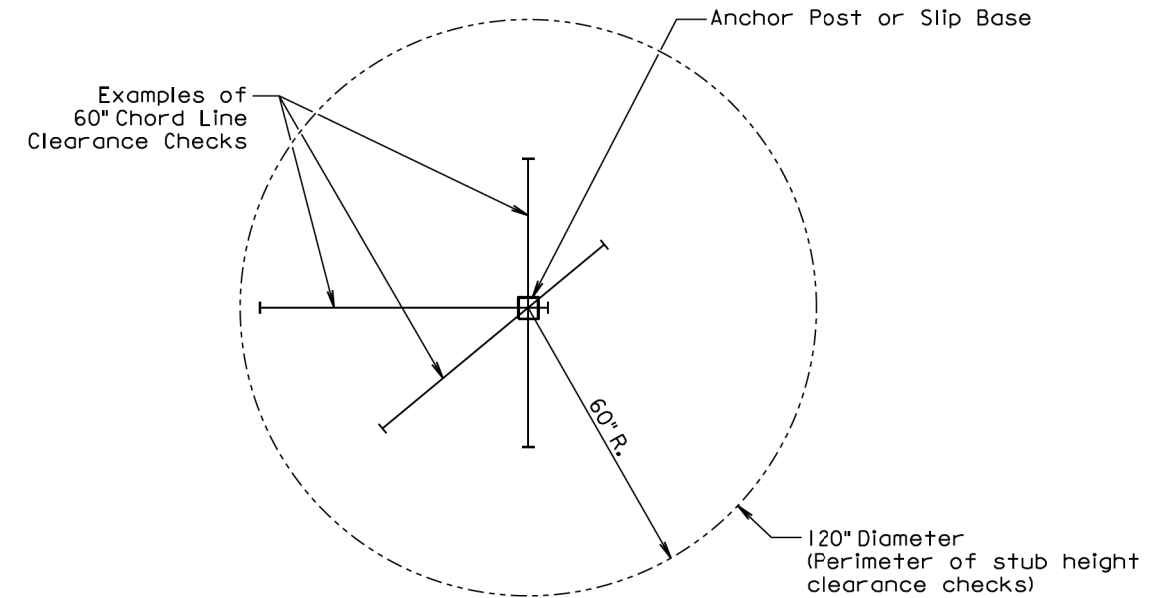
\* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



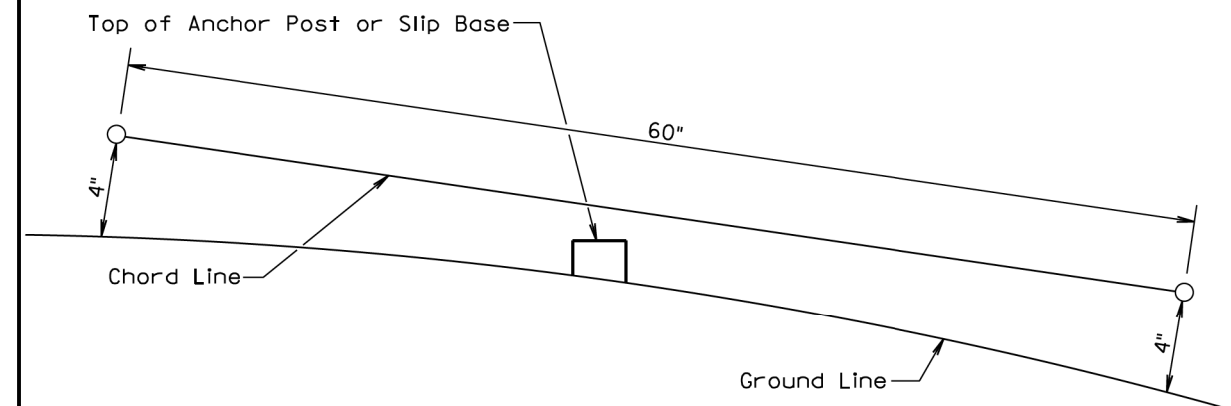
RURAL DISTRICT  
3 DAY MAXIMUM  
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 2nd Qtr. 2015	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW  
(Examples of stub height clearance checks)



ELEVATION VIEW

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. 2015	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

PLOT SCALE - 1:1.2

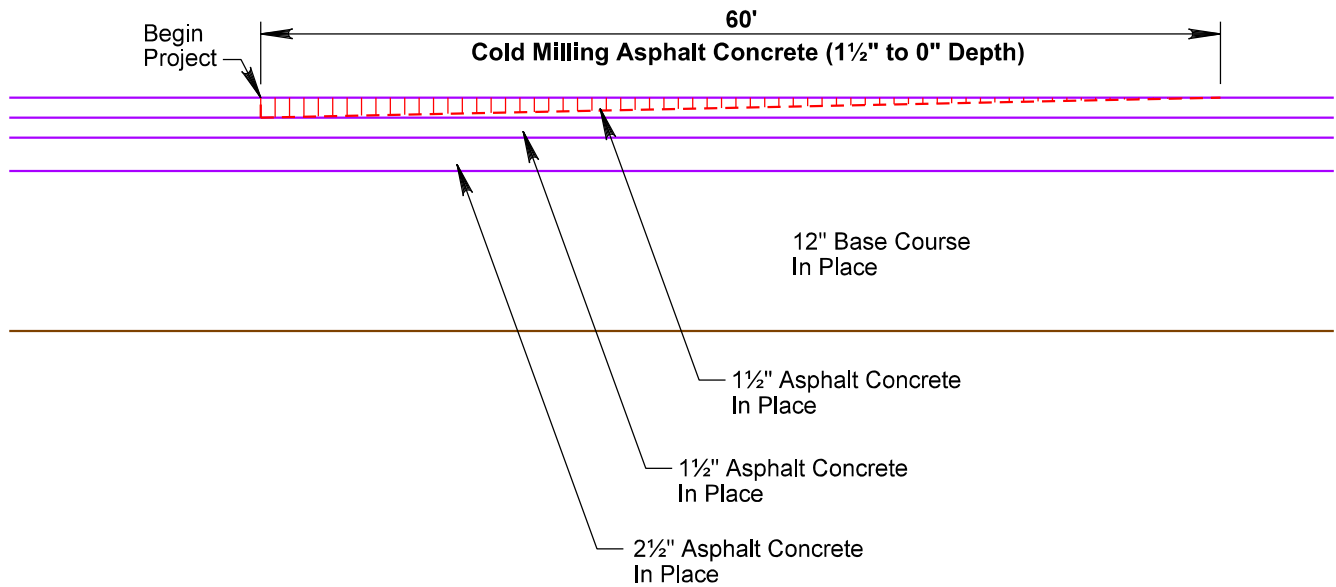
PLOTTED FROM - TURN15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	15	25

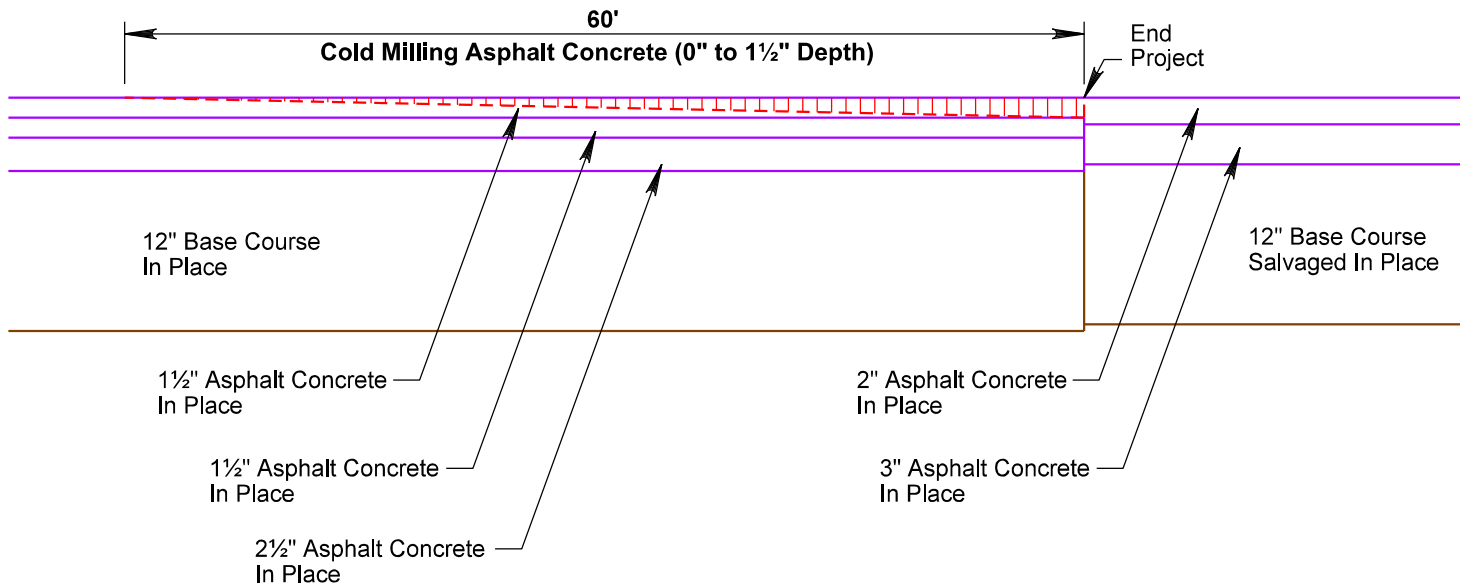
Plotting Date: 04/24/2015

# COLD MILLING TAPER

## AT BEGIN PROJECT

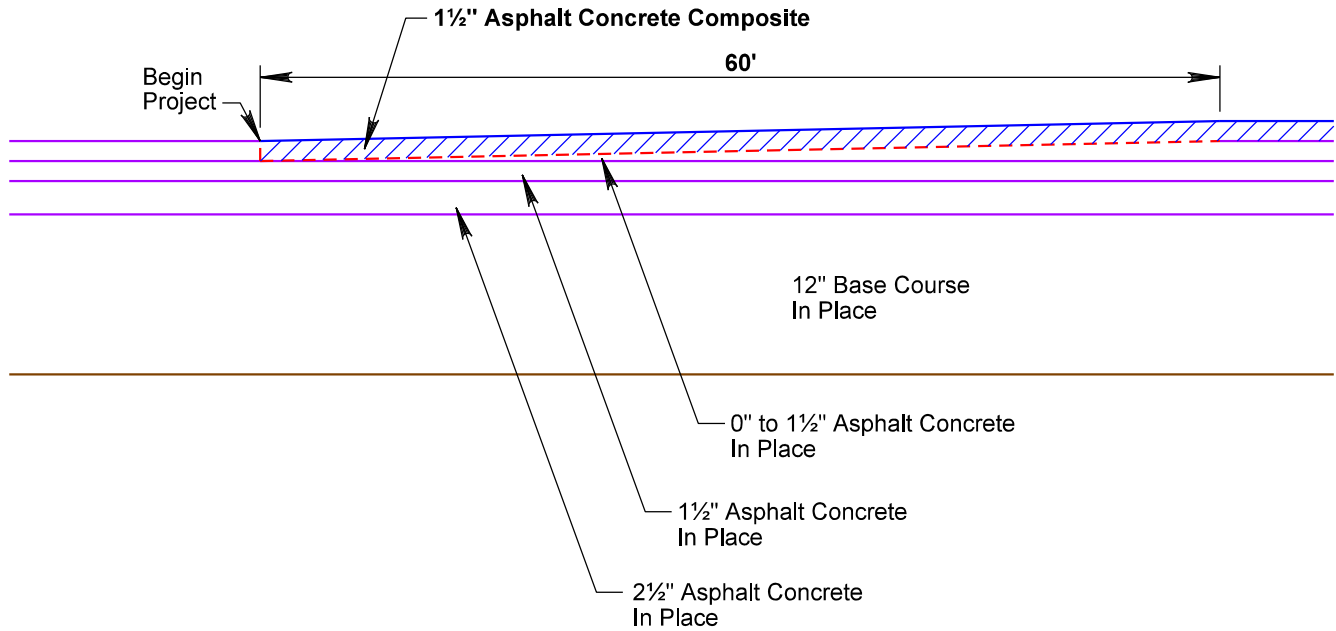


## AT END PROJECT

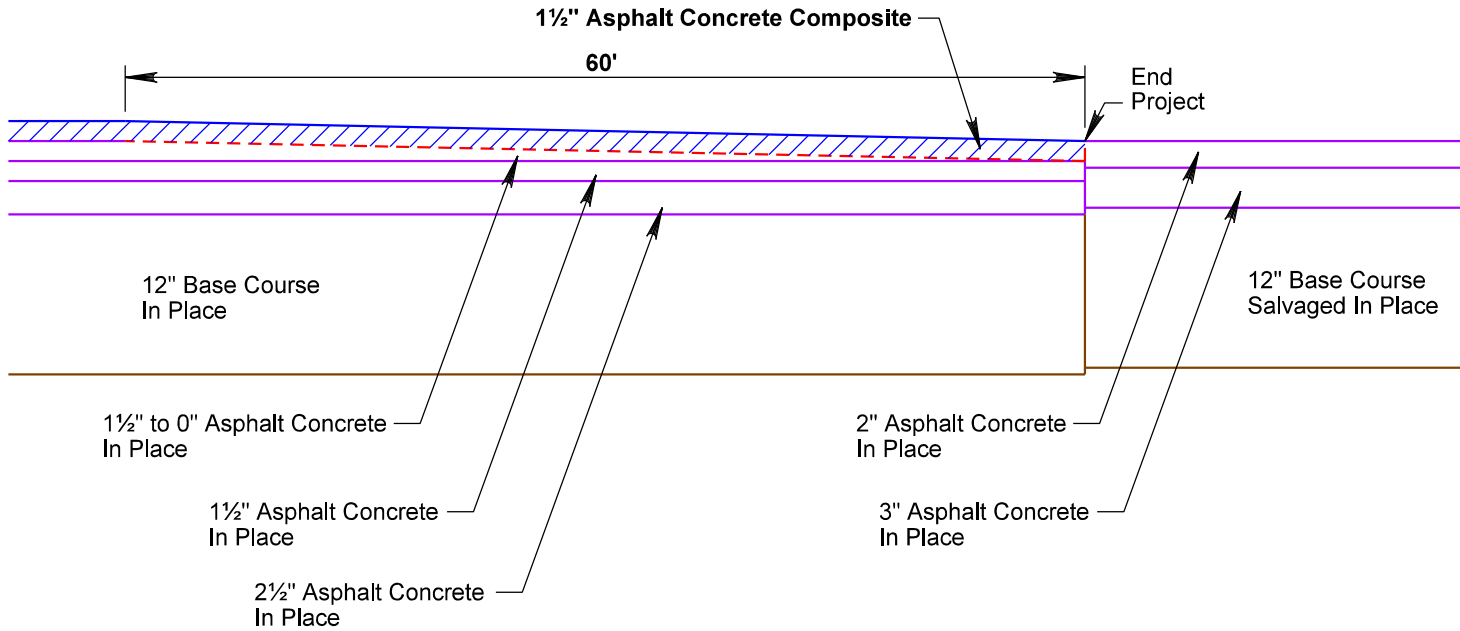


# RESURFACING TAPER

## AT BEGIN PROJECT



## AT END PROJECT



PLOT NAME - 5

FILE - ...TURN130P\MILL130P.DGN

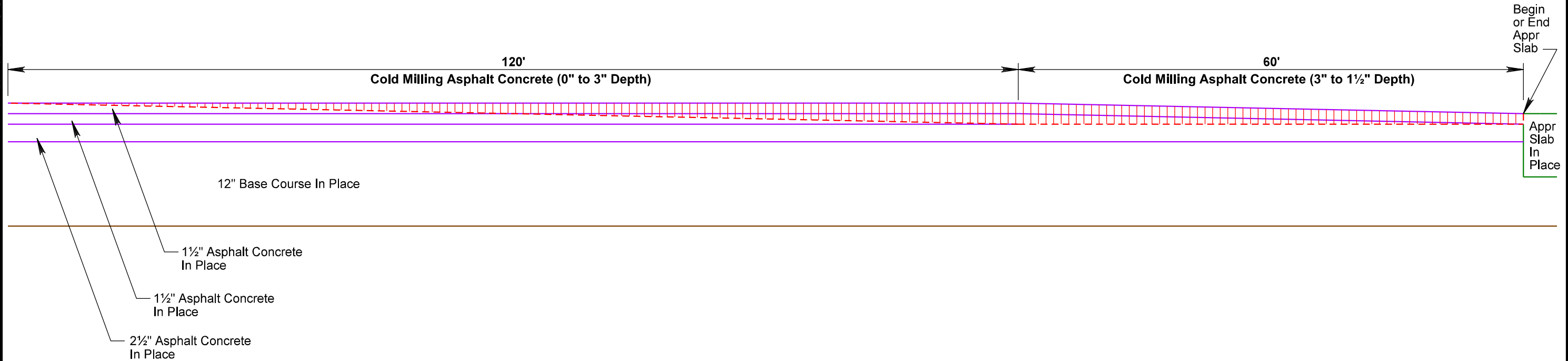
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	16	25

Plotting Date: 04/24/2015

# COLD MILLING TAPER

## AT BEGIN OR END APPROACH SLAB

PLOT SCALE - 1"=12'



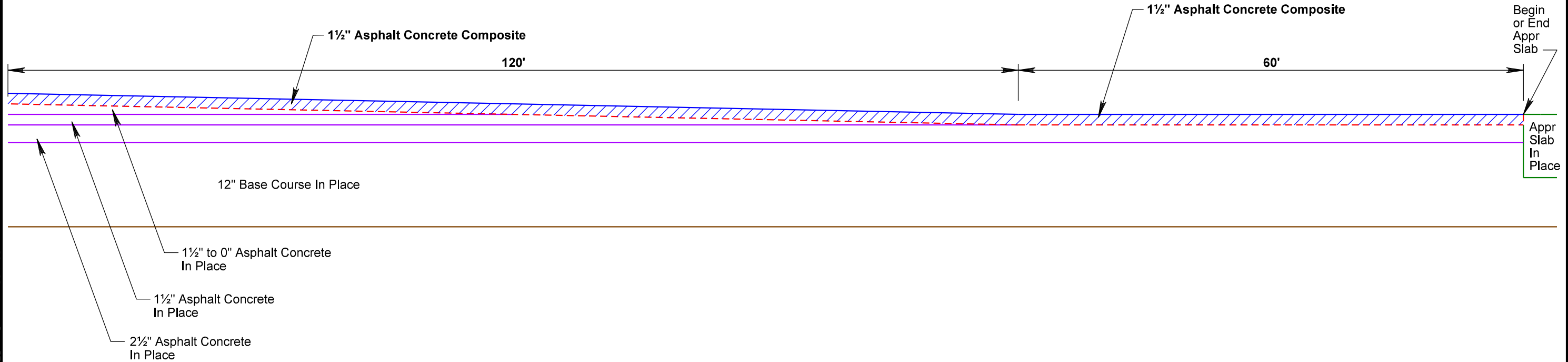
PLOT NAME - 6

FILE - ...TURN130P\MILL130P.DGN

# RESURFACING TAPER

## AT BEGIN OR END APPROACH SLAB

PLOTTED FROM - TURN130P.DGN



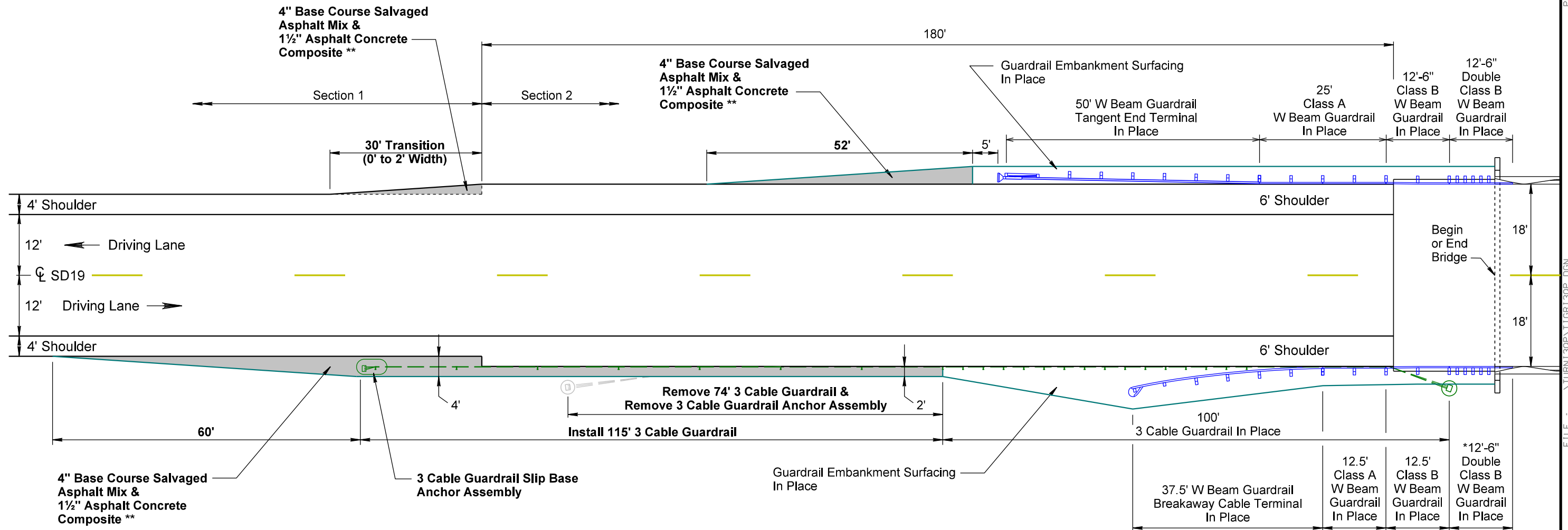
# INSTALLATION OF GUARDRAIL

**STR. NO. 63-140-062**

**MRM 55.13**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	<b>019-271</b>	<b>17</b>	<b>25</b>

Plotting Date: 04/17/2015



\* 3'-6" of guardrail overlaps onto structure.

**\*\* The Contractor shall remove existing topsoil from these locations to allow room for placement of the surfacing material. Topsoil may be bladed uniformly onto the inslope to the satisfaction of the Engineer.**

**Cost for this work including labor, equipment and incidentals shall be incidental to the contract unit price for Base Course, Salvaged Asphalt Mix.**

PLOT SCALE - 1:200

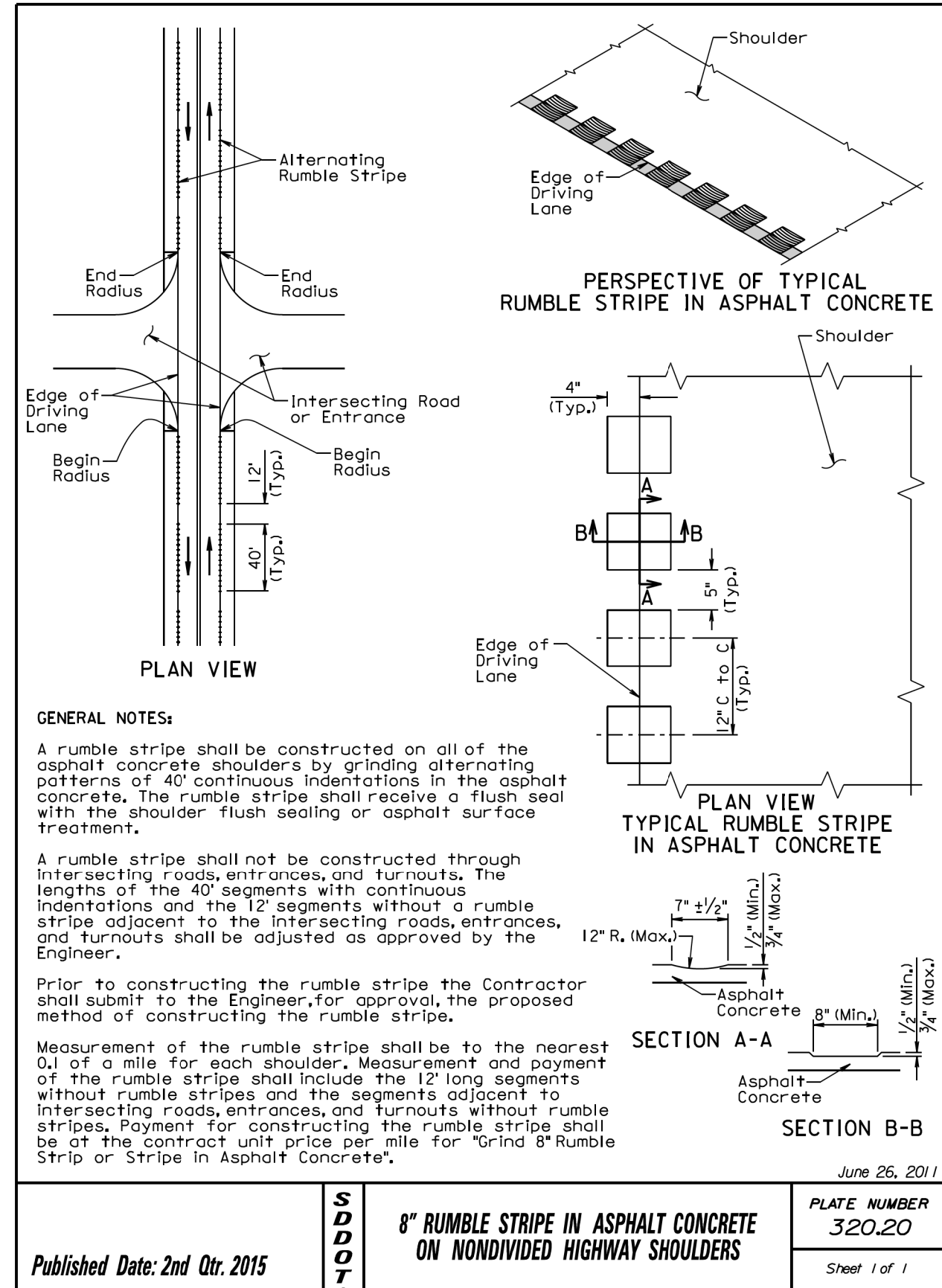
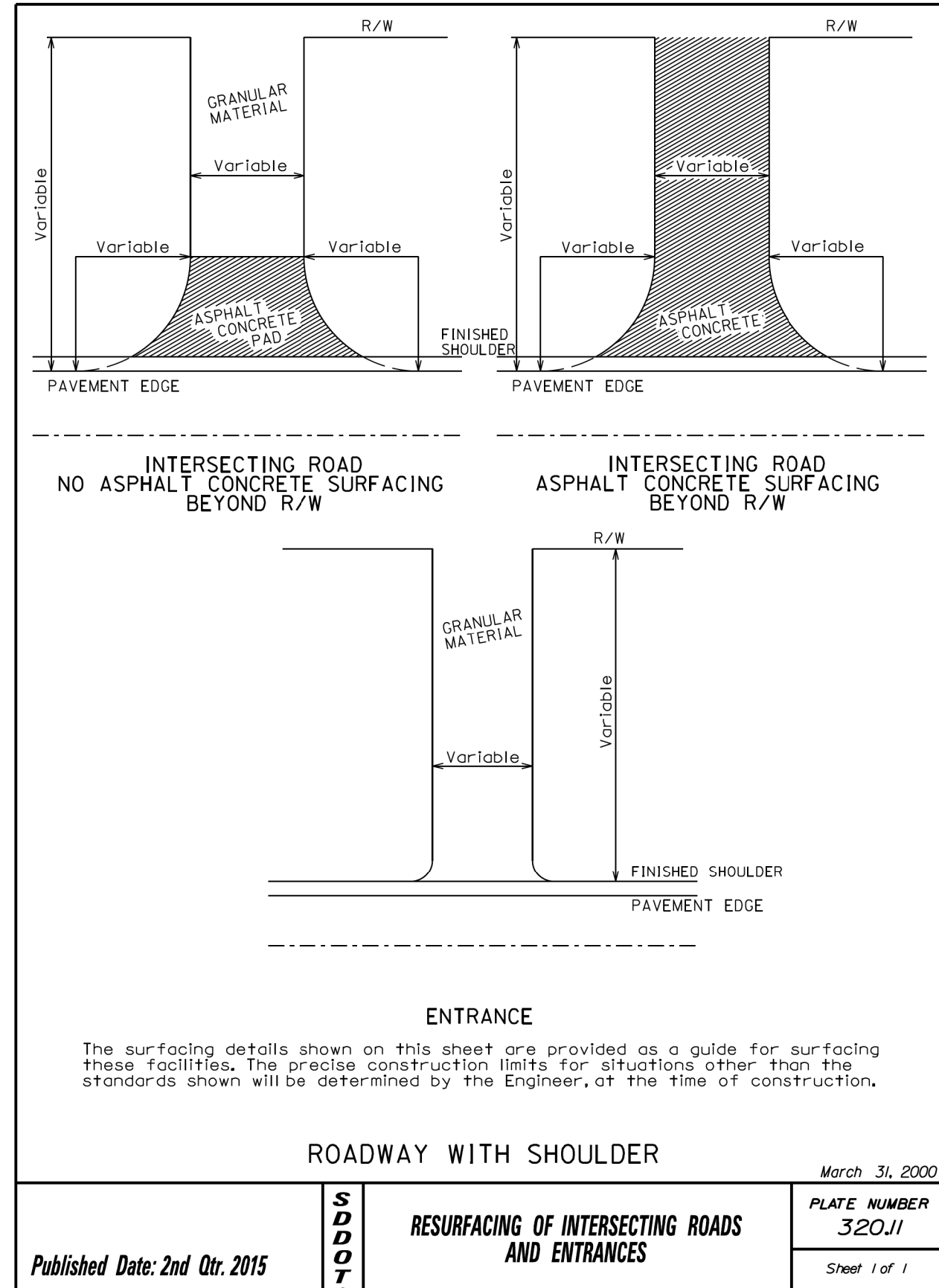
PLOTTED FROM - TRMI1NT15

PLU1 NAME - /

FILE - ... \TURN13UP\1IGR13UP.DGN

PLOT SCALE - 1:200

PLOTTED FROM - TRM11115

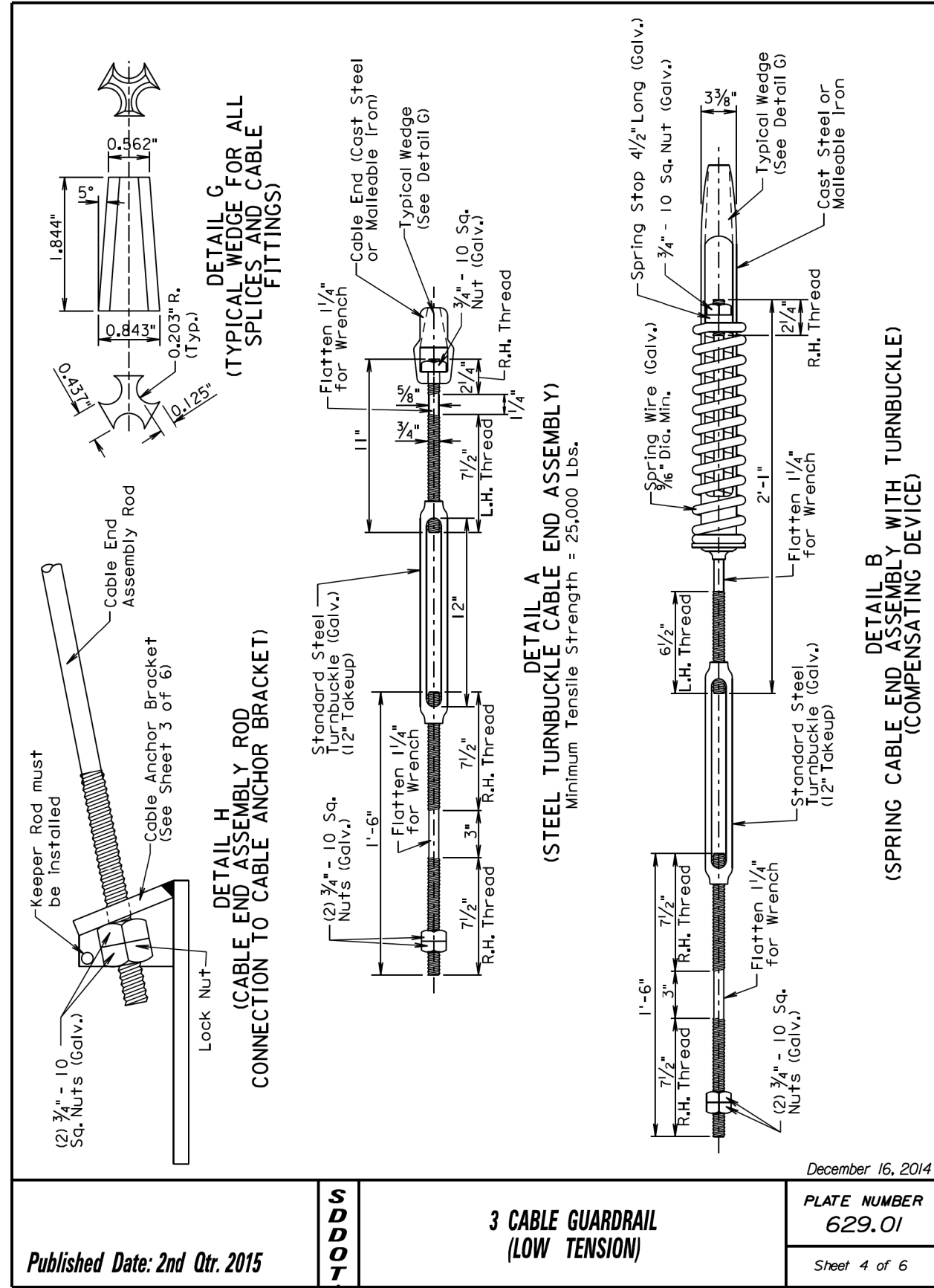


PLOT NAME - 1

FILE - ...TURN130PSTD PLATES 130P.DGN

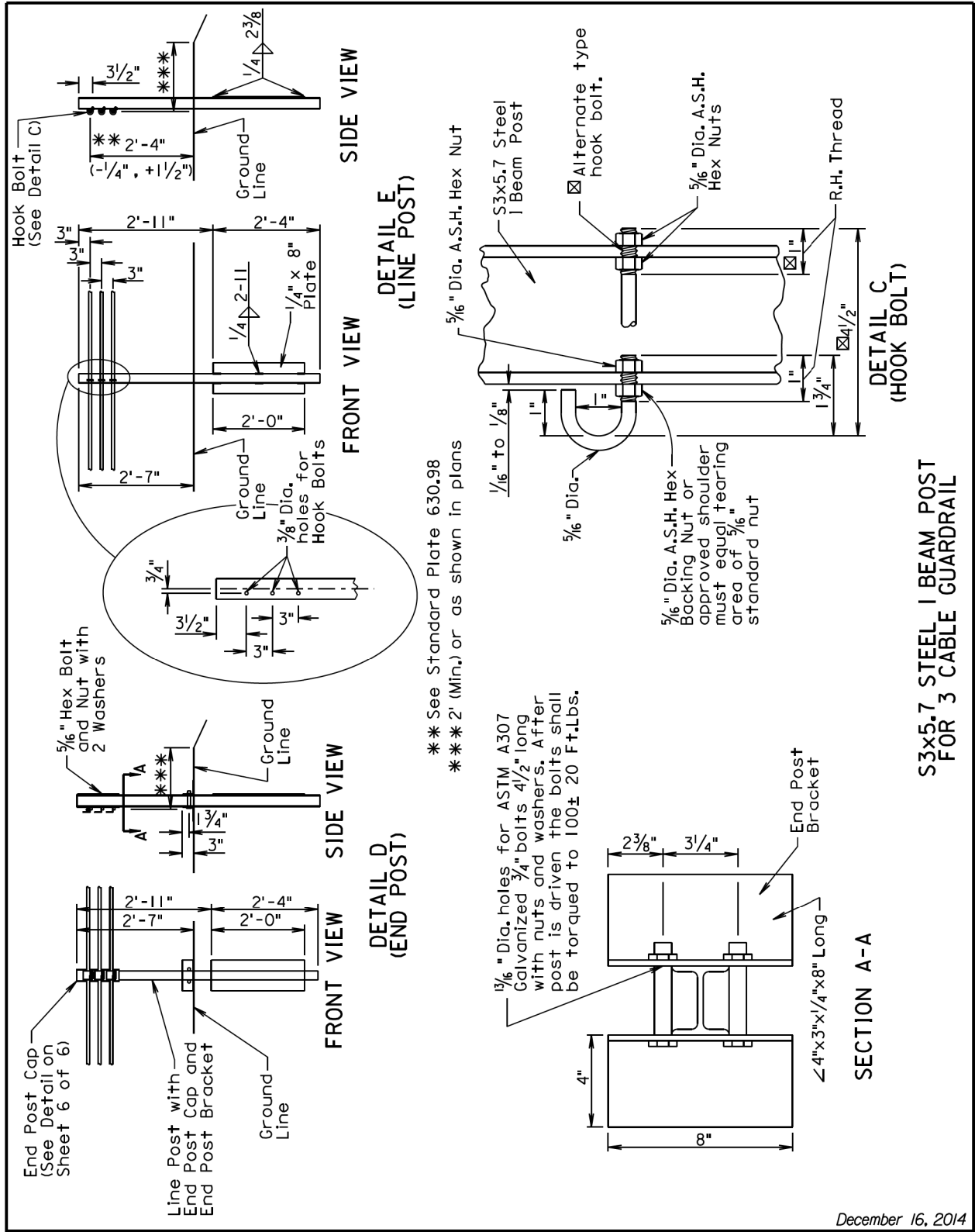






Published Date: 2nd Qtr. 2015	S D D O T	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER
			629.01
			Sheet 5 of 6

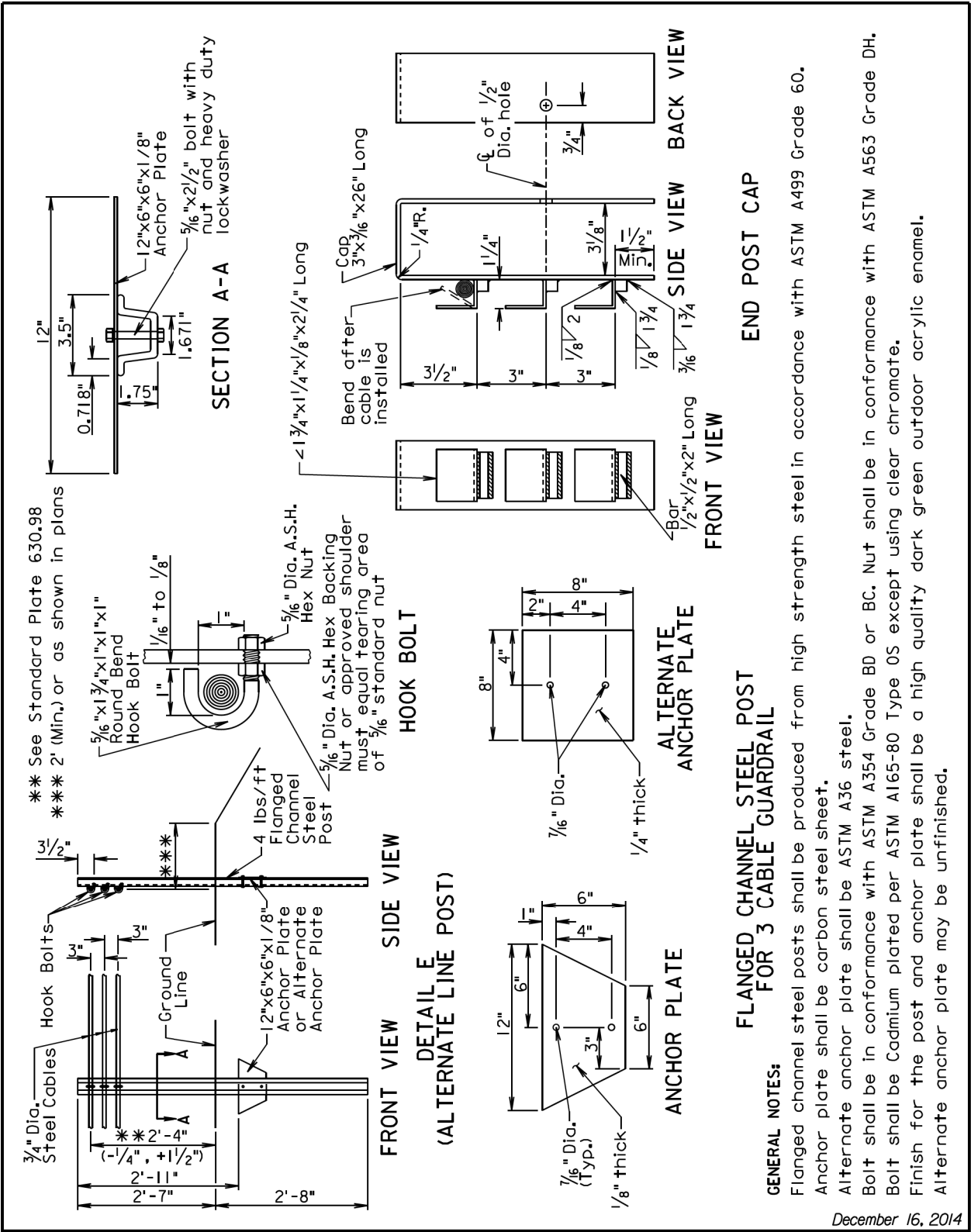
December 16, 2014



S3x5.7 STEEL I BEAM POST  
FOR 3 CABLE GUARDRAIL

Published Date: 2nd Qtr. 2015	S D D O T	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER
			629.01
			Sheet 6 of 6

December 16, 2014



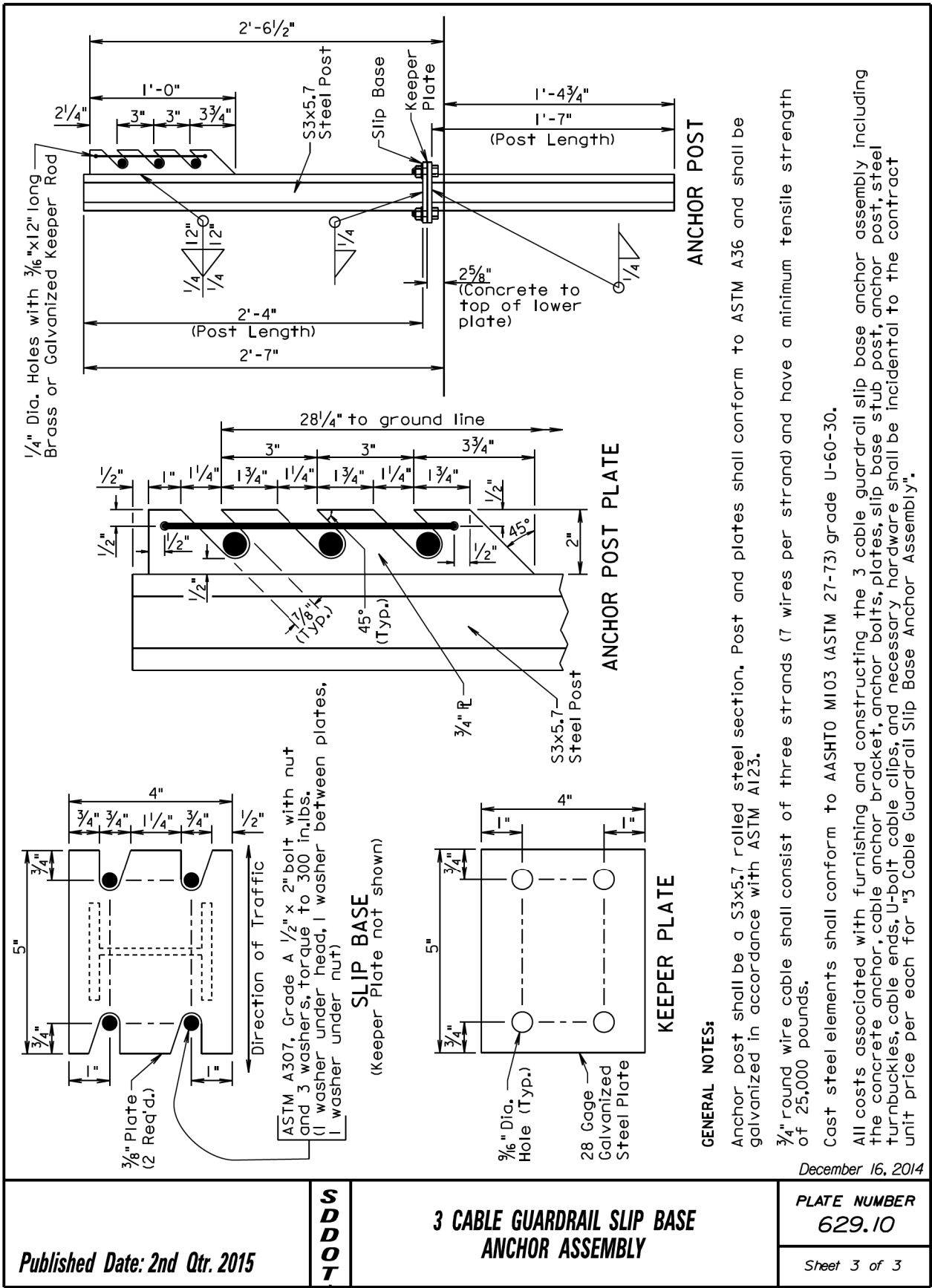
FLANGED CHANNEL STEEL POST  
FOR 3 CABLE GUARDRAIL

**GENERAL NOTES:**  
Flanged channel steel posts shall be produced from high strength steel in accordance with ASTM A499 Grade 60.  
Anchor plate shall be carbon steel sheet.  
Alternate anchor plate shall be ASTM A36 steel.  
Bolt shall be in conformance with ASTM A354 Grade BD or BC. Nut shall be in conformance with ASTM A563 Grade DH.  
Bolt shall be Cadmium plated per ASTM A165-80 Type OS except using clear chromate.  
Finish for the post and anchor plate shall be a high quality dark green outdoor acrylic enamel.  
Alternate anchor plate may be unfinished.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	21	25

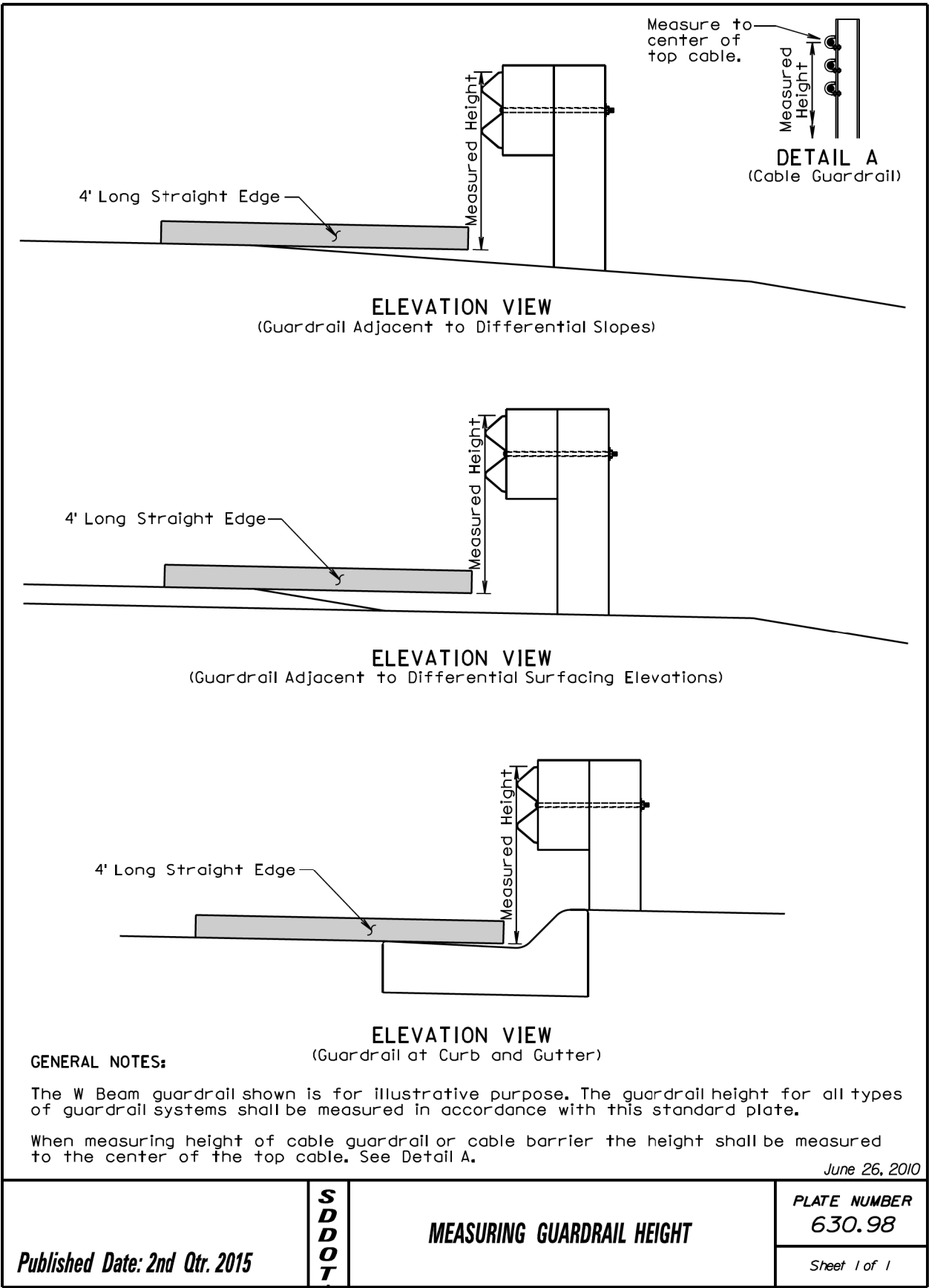
Plotting Date: 04/17/2015





STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	23	25

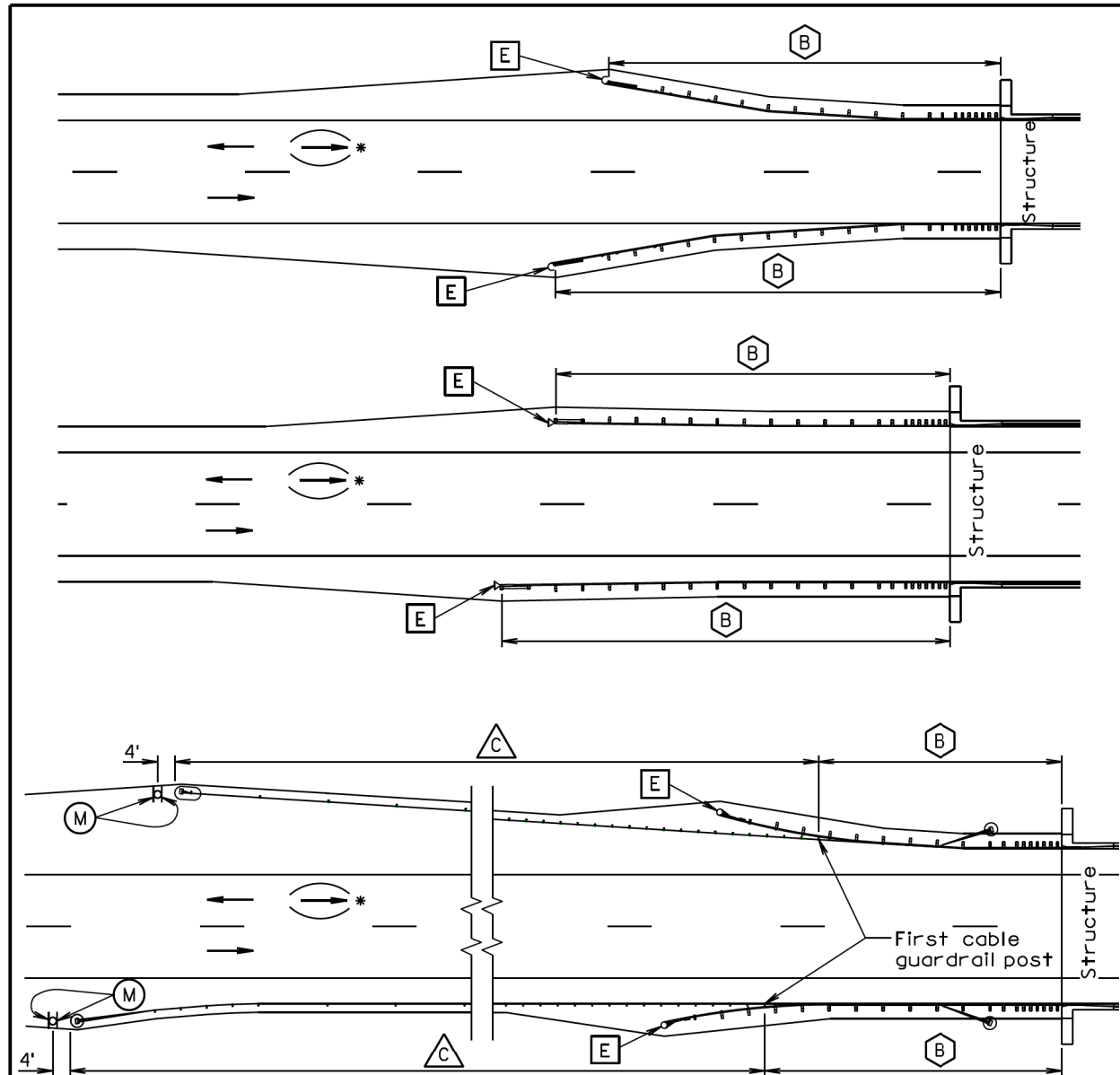
Plotting Date: 04/17/2015





STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	24	25

Plotting Date: 04/17/2015



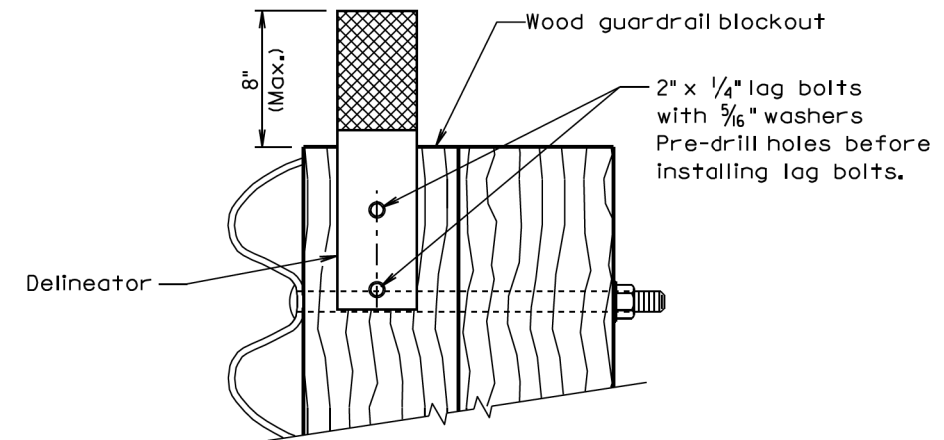
TYPICAL GUARDRAIL LAYOUTS

- B Steel Beam Guardrail Delineation
- E Guardrail Terminal End Object Marker
- C 3 Cable Guardrail Delineation
- M Type 2 Object Marker

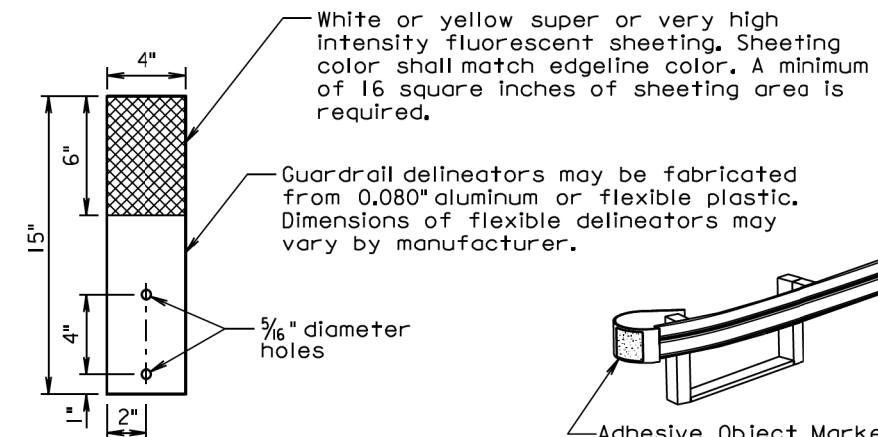
\*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 26, 2011

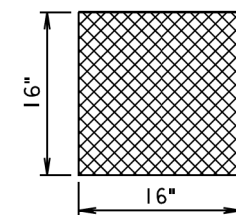
Published Date: 2nd Qtr. 2015	S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 1 of 4



B STEEL BEAM GUARDRAIL DELINEATION

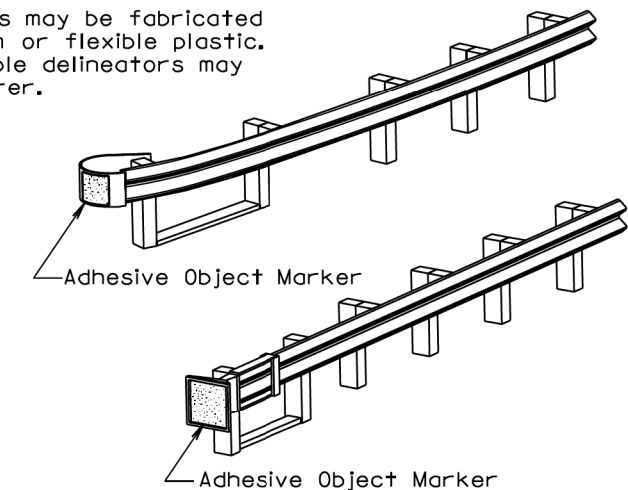


DELINEATOR  
(For Steel Beam Guardrail)



ADHESIVE OBJECT MARKER

Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting shall be fluorescent yellow super or very high intensity.



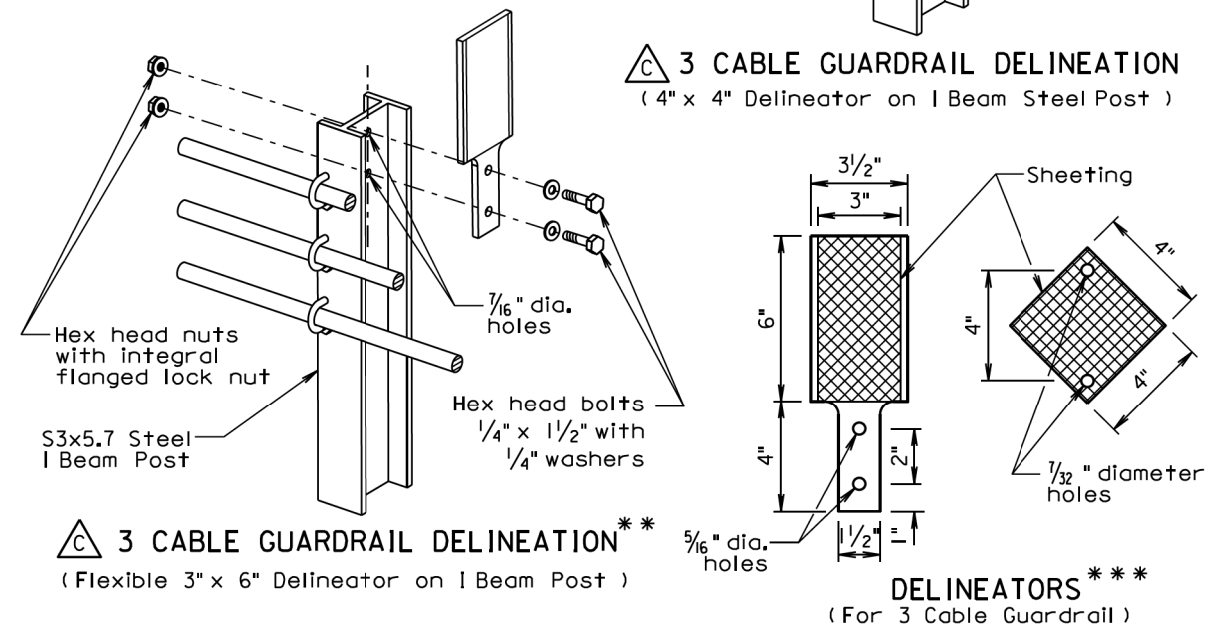
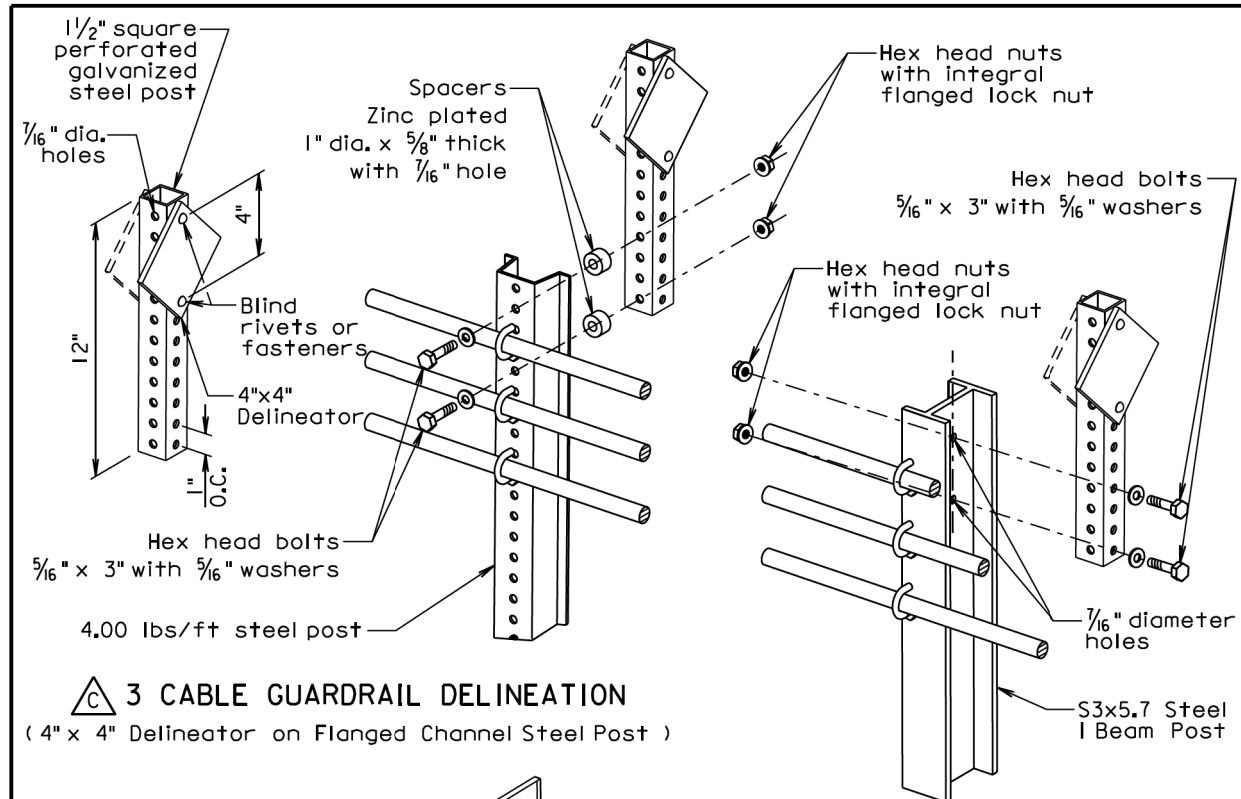
E GUARDRAIL TERMINAL END OBJECT MARKER

June 26, 2011

Published Date: 2nd Qtr. 2015	S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 2 of 4

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	019-271	25	25

Plotting Date: 04/17/2015



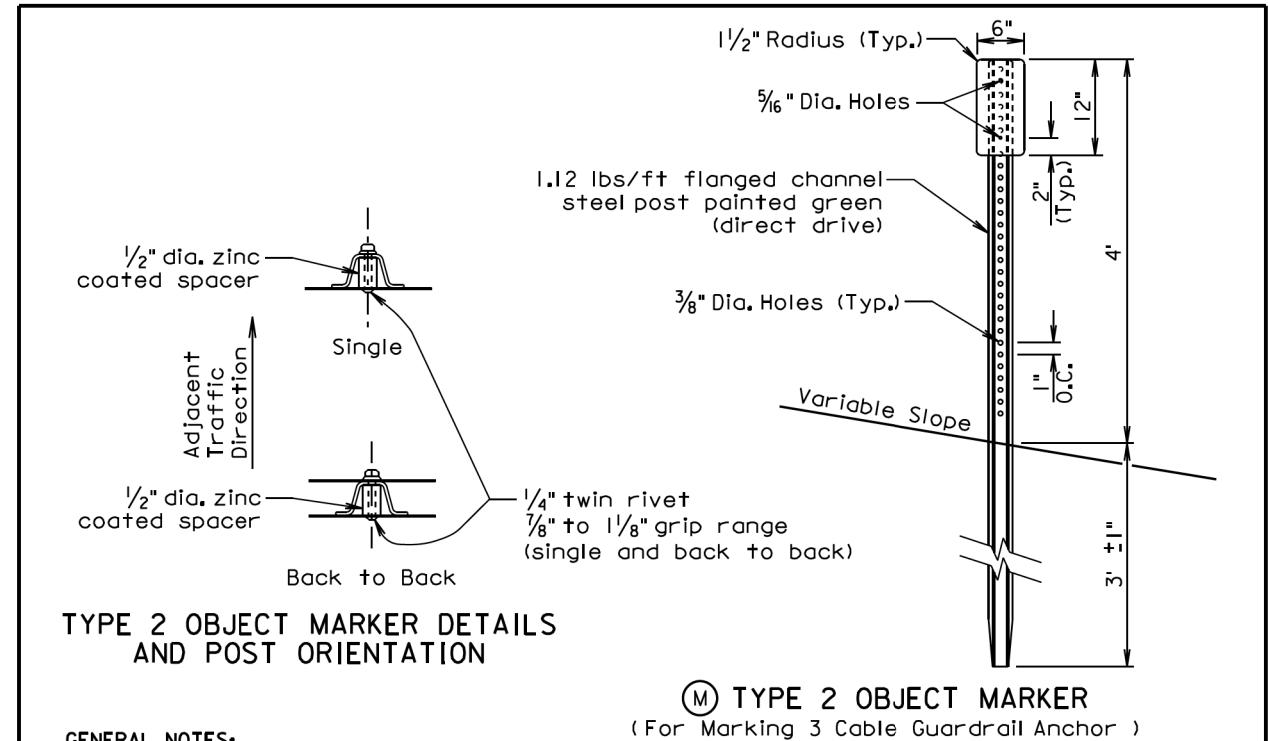
\*\*\* Flexible delineators may be attached to post with manufacturer approved adhesive instead of bolts.

\*\*\* Dimensions of flexible delineators may vary by manufacturer. A minimum of 16 square inches of sheeting area is required. The sheeting shall be white or yellow super or very high intensity fluorescent sheeting. The sheeting color shall match the edgeline color.

June 26, 2011

Published Date: 2nd Qtr. 2015	S D D O T	PLATE NUMBER
		632.40
		Sheet 3 of 4

## DELINEATION OF GUARDRAIL AT BRIDGES



## GENERAL NOTES:

The delineators shall be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting shall be of either very high intensity or super high intensity material. For bridges along two-way roadways the sheeting shall be on both sides of the delineator and shall be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

The first delineator shall be attached to the post nearest the bridge with additional delineators spaced in advance of the bridge at approximately 50 foot intervals. At bridges with short lengths of guardrail, less than 200 feet, a minimum of 4 delineators shall be placed in addition to the yellow object marker. The spacing between the delineators shall be approximately one third of the length of the guardrail. This will provide for a shorter spacing. At bridges with longer lengths of guardrail, greater than 200 feet, including bridges that have cable guardrail transitioning into the steel beam guardrail, the delineators will be placed at a spacing of approximately 50 feet. Delineation shall extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation shall be included in the contract unit price per each for "Guardrail Delineator".

An adhesive object marker shall be placed on the end of the W beam guardrail end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

A type 2 object marker shall be placed adjacent to the 3 cable guardrail anchor at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") shall have a fluorescent yellow very high or super high intensity reflective sheeting. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware shall be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

June 26, 2011

Published Date: 2nd Qtr. 2015	S D D O T	PLATE NUMBER
		632.40
		Sheet 4 of 4

## DELINEATION OF GUARDRAIL AT BRIDGES