

STATE OF SOUTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	1	75

Plotting Date: 02/06/2015

PLANS FOR PROPOSED  
**PROJECTS NH 0281(110)105  
& NH 0281(109)145**  
**US HIGHWAY 281**  
**BEADLE & SPINK COUNTIES**

ASPHALT CONCRETE RESURFACING  
CULVERT WORK, PAVEMENT MARKING, SIGNING & GUARDRAIL

PCN 0367 & 04W8

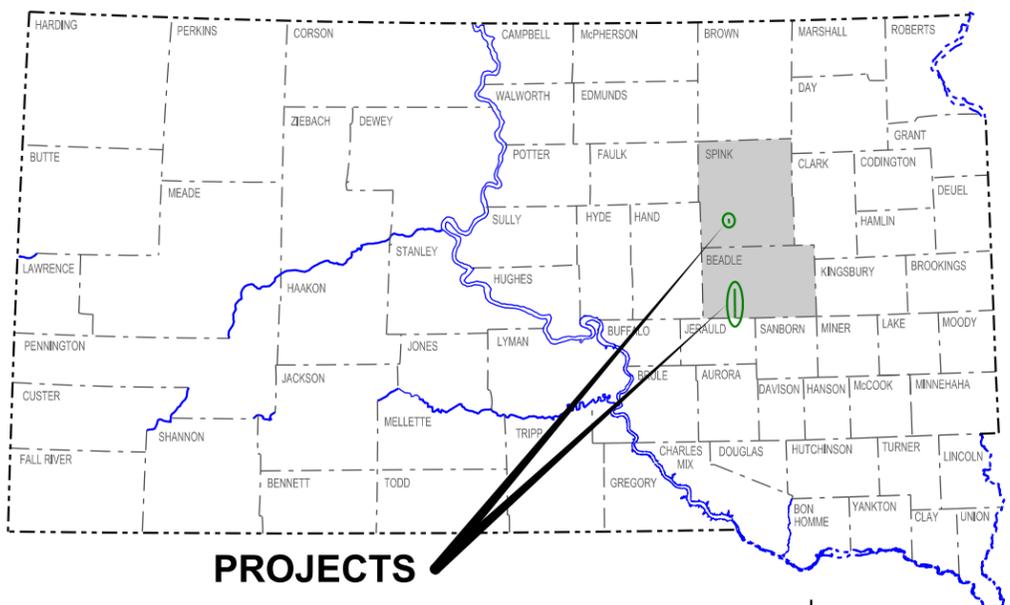
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PLOT SCALE - 1"=10937.5'

PLOT NAME -

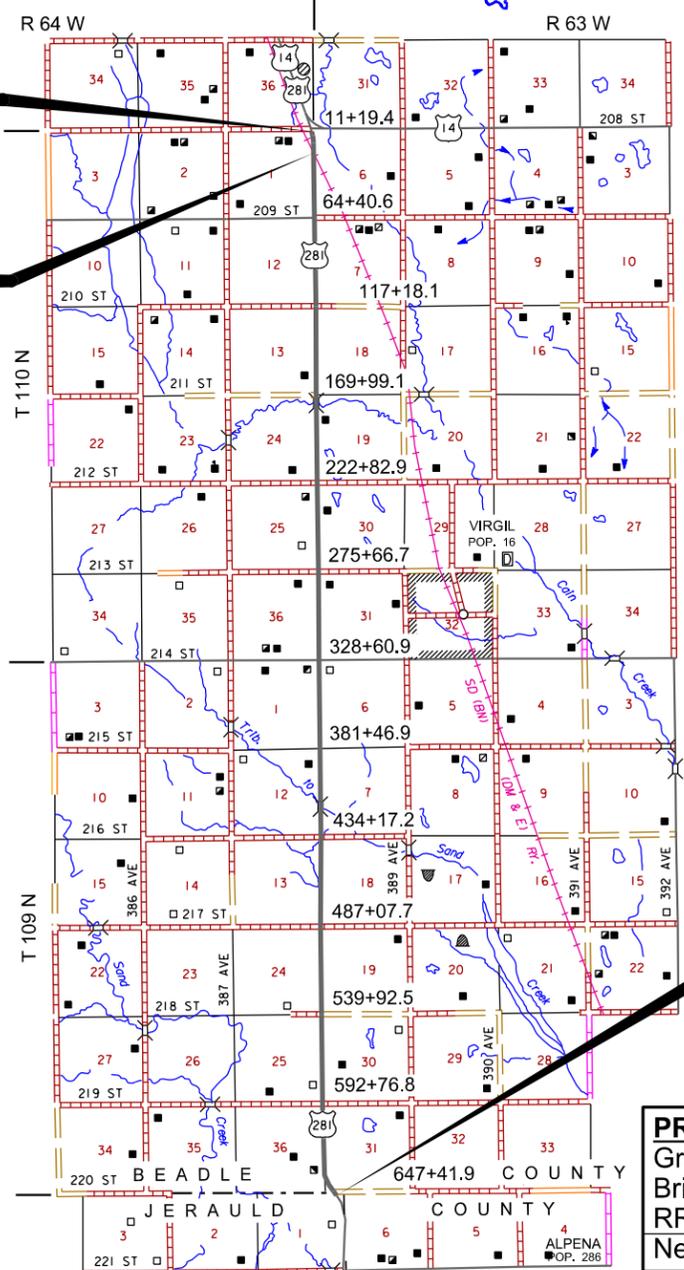
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PROJECTS

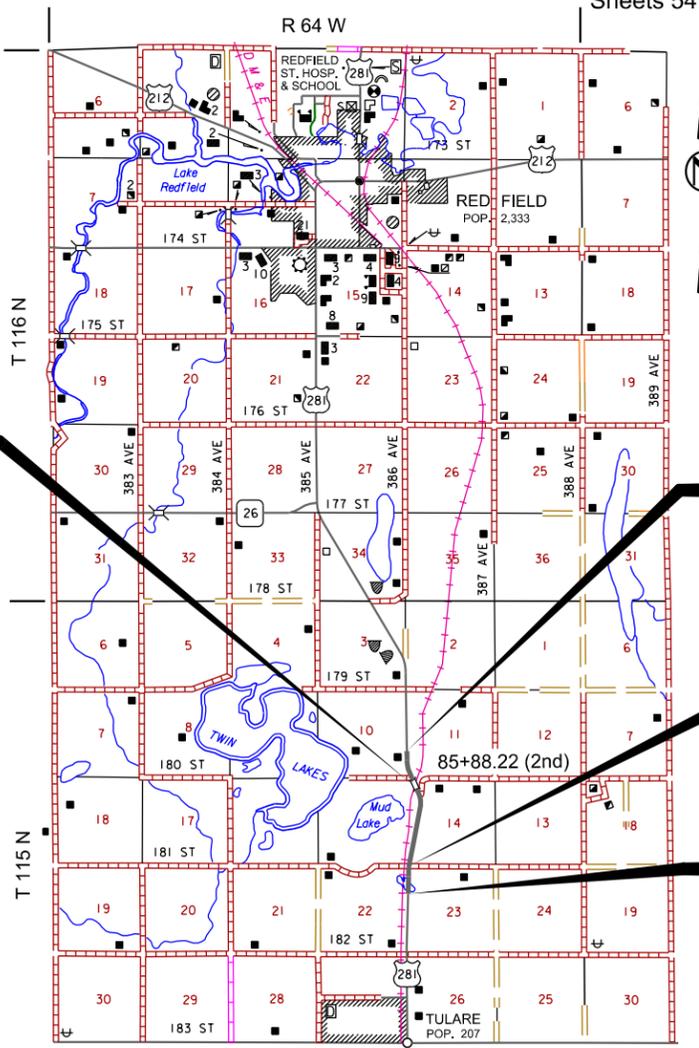
**BEGIN NH 0281(110)105**  
STA. 11+90  
MRM 117.00 +0.132  
(70' S of  $\varnothing$  US14)

**RR CROSSING at**  
21+95.5 (by others)  
~25' Length along  $\varnothing$   
(21+83 to 22+08)



**STR. NO. 58-101-321**  
79+88.57 (2nd) to 82+34.01 (2nd)  
Cont. Comp. Girder Bridge  
245'-5 1/4"=0.046 Mile  
MRM 146.39  
Two Approach/Sleeper Slabs  
2@31'-8"=63'-4"=0.012 Mile

**END NH 0281(110)105**  
STA. 649+22  
MRM 105.11 -0.034  
(180' S of County Line)



**END NH 0281(109)145**  
STA. 102+28 (2nd)  
MRM 146.00 +0.768  
(1,640' N of  $\varnothing$  180th St)

**EQUATION**  
Sta. 115+50 Back=  
Sta. 31+58 (2nd) Ahead

**BEGIN NH 0281(109)145**  
STA. 99+92  
MRM 145.00 +0.133  
(1,558' S of  $\varnothing$  181st St)

**STORM WATER PERMIT**  
(None required)

DESIGN DESIGNATION		
SEGMENT	SOUTH	NORTH
ADT(2013)	1,460	1,707
ADT(2033)	1,981	2,018
DHV	240	329
D	50%	50%
T DHV	10.5%	10.1%
T ADT	23.0%	22.2%
V	65 MPH	65 MPH

PROJECT LENGTH	NH 0281(110)105		NH 0281(109)145		GRAND TOTALS	
Gross Length:	63,732'	12.070 Miles	8,628'	1.634 Miles	72,360'	13.704 Miles
Bridge/Slab Length:	-	- Mile	308'	0.058 Mile	308'	0.058 Mile
RR Xing Length:	25'	0.004 Mile	-	- Mile	25'	0.004 Mile
Net Length:	63,707'	12.066 Miles	8,320'	1.576 Miles	72,027'	13.642 Miles

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# ESTIMATE OF QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	2	75

## NH 0281(110)105

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0130	Remove Traffic Sign	52	Each
110E0500	Remove Pipe Culvert	6	Ft
110E0510	Remove Pipe End Section	3	Each
110E7150	Remove Sign for Reset	1	Each
110E7500	Remove Pipe for Reset	258	Ft
110E7510	Remove Pipe End Section for Reset	37	Each
120E0100	Unclassified Excavation, Digouts	603	CuYd
120E0600	Contractor Furnished Borrow	435	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
260E1010	Base Course	3,303.0	Ton
320E0007	PG 64-28 Asphalt Binder	2,179.9	Ton
320E1003	Class Q3 Hot Mixed Asphalt Concrete	39,316.0	Ton
320E4000	Hydrated Lime	389.3	Ton
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	24.1	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	71.5	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	61.1	Ton
330E2000	Sand for Flush Seal	642.0	Ton
332E0010	Cold Milling Asphalt Concrete	2,312	SqYd
450E0162	30" RCP Class 2, Furnish	6	Ft
450E0170	30" RCP, Install	6	Ft
450E2008	18" RCP Flared End, Furnish	3	Each
450E2009	18" RCP Flared End, Install	3	Each
450E2024	30" RCP Flared End, Furnish	2	Each
450E2025	30" RCP Flared End, Install	2	Each
* 450E8900	Cleanout Pipe Culvert	2	Each
450E9000	Reset Pipe	258	Ft
450E9001	Reset Pipe End Section	37	Each
600E0300	Type III Field Laboratory	1	Each
632E1320	2.0"x2.0" Perforated Tube Post	573.0	Ft
632E1340	2.5"x2.5" Perforated Tube Post	70.0	Ft
632E2510	Type 2 Object Marker Back to Back	20	Each
632E2520	Type 2 Object Marker	70	Each
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	141.8	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	247.4	SqFt
632E3500	Reset Sign	1	Each
633E0030	Cold Applied Plastic Pavement Marking, 24"	80	Ft
633E0035	Cold Applied Plastic Pavement Marking, Area	100	SqFt
633E0055	Cold Applied Plastic Pavement Marking, Railroad Crossing	2	Each
633E1300	Pavement Marking Paint, White	408.0	Gal
633E1305	Pavement Marking Paint, Yellow	122.0	Gal
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	80	Ft
633E5020	Grooving for Cold Applied Plastic Pavement Marking, Area	100	SqFt
633E5040	Grooving for Cold Applied Plastic Pavement Marking, Railroad Crossing	2	Each
634E0010	Flagging	400	Hour
634E0020	Pilot Car	200	Hour
634E0100	Traffic Control	874	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0630	Temporary Pavement Marking	24.2	Mile
734E0010	Erosion Control	Lump Sum	LS
900E0010	Refurbish Single Mailbox	3	Each
900E1980	Storage Unit	1	Each
998E0100	Railroad Protective Insurance	Lump Sum	LS

\* - Denotes Non-Participating

## NH 0281(109)145

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0130	Remove Traffic Sign	13	Each
110E0700	Remove 3 Cable Guardrail	962	Ft
110E0730	Remove Beam Guardrail	325.0	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	8	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	4	Each
120E0100	Unclassified Excavation, Digouts	79	CuYd
260E1010	Base Course	376.0	Ton
320E0007	PG 64-28 Asphalt Binder	303.1	Ton
320E1003	Class Q3 Hot Mixed Asphalt Concrete	5,466.0	Ton
320E4000	Hydrated Lime	54.0	Ton
320E7012	Grind 12" Rumble Strip or Stripe in Asphalt Concrete	3.2	Mile
330E0100	SS-1h or CSS-1h Asphalt for Tack	12.6	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	7.9	Ton
330E2000	Sand for Flush Seal	87.0	Ton
332E0010	Cold Milling Asphalt Concrete	2,454	SqYd
629E0100	3 Cable Guardrail	1,088	Ft
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	4	Each
629E0400	3 Cable Guardrail Anchor Assembly	4	Each
630E0110	Straight Double Class A Thrie Beam Guardrail with Wood Posts	50.0	Ft
630E1010	Straight Class A W Beam Guardrail with Wood Posts	250.0	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	4	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	4	Each
632E1320	2.0"x2.0" Perforated Tube Post	94.0	Ft
632E1340	2.5"x2.5" Perforated Tube Post	60.0	Ft
632E2220	Guardrail Delineator	26	Each
632E2510	Type 2 Object Marker Back to Back	4	Each
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	94.3	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	67.0	SqFt
633E0030	Cold Applied Plastic Pavement Marking, 24"	98	Ft
633E0035	Cold Applied Plastic Pavement Marking, Area	150	SqFt
633E0040	Cold Applied Plastic Pavement Marking, Arrow	2	Each
633E1300	Pavement Marking Paint, White	56.0	Gal
633E1305	Pavement Marking Paint, Yellow	24.0	Gal
633E5015	Grooving for Cold Applied Plastic Pavement Marking, 24"	98	Ft
633E5020	Grooving for Cold Applied Plastic Pavement Marking, Area	150	SqFt
633E5025	Grooving for Cold Applied Plastic Pavement Marking, Arrow	2	Each
634E0010	Flagging	120	Hour
634E0020	Pilot Car	40	Hour
634E0100	Traffic Control	738	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0630	Temporary Pavement Marking	3.3	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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	3	75

## 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.

#### 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.

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 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.

### COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the US Army Corps of Engineers for the permanent actions associated with this project.

#### Action Taken/Required:

The Contractor shall comply with all requirements contained in the Section 404 permit.

The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

# TYPICAL RESURFACING SECTION

NH 0281(110)105

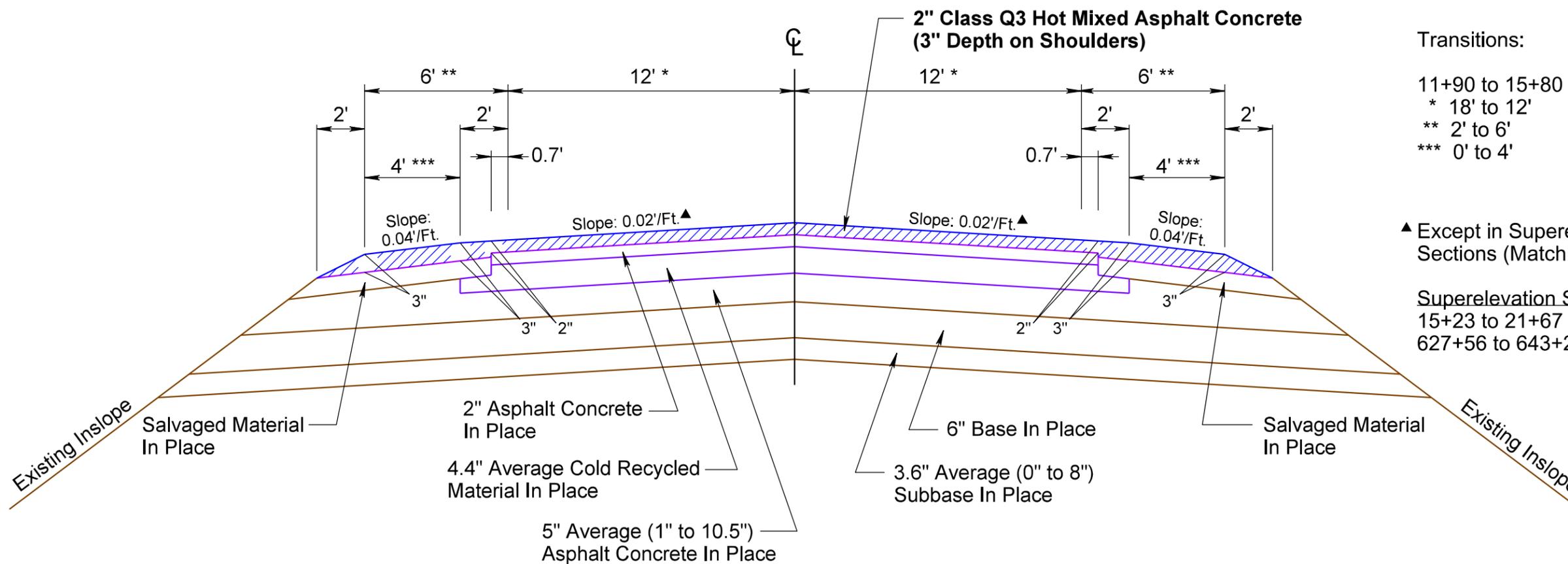
SECTION 1

11+90 to 21+83

22+08 to 649+22

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	4	75

Plotting Date: 02/06/2015



Transitions:

11+90 to 15+80

\* 18' to 12'

\*\* 2' to 6'

\*\*\* 0' to 4'

▲ Except in Superelevation Sections (Match Existing)

Superelevation Sections

15+23 to 21+67

627+56 to 643+24

PLOT SCALE - 1:5

PLOTTED FROM - IRMIN115

PLOT NAME - 2

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	5	75

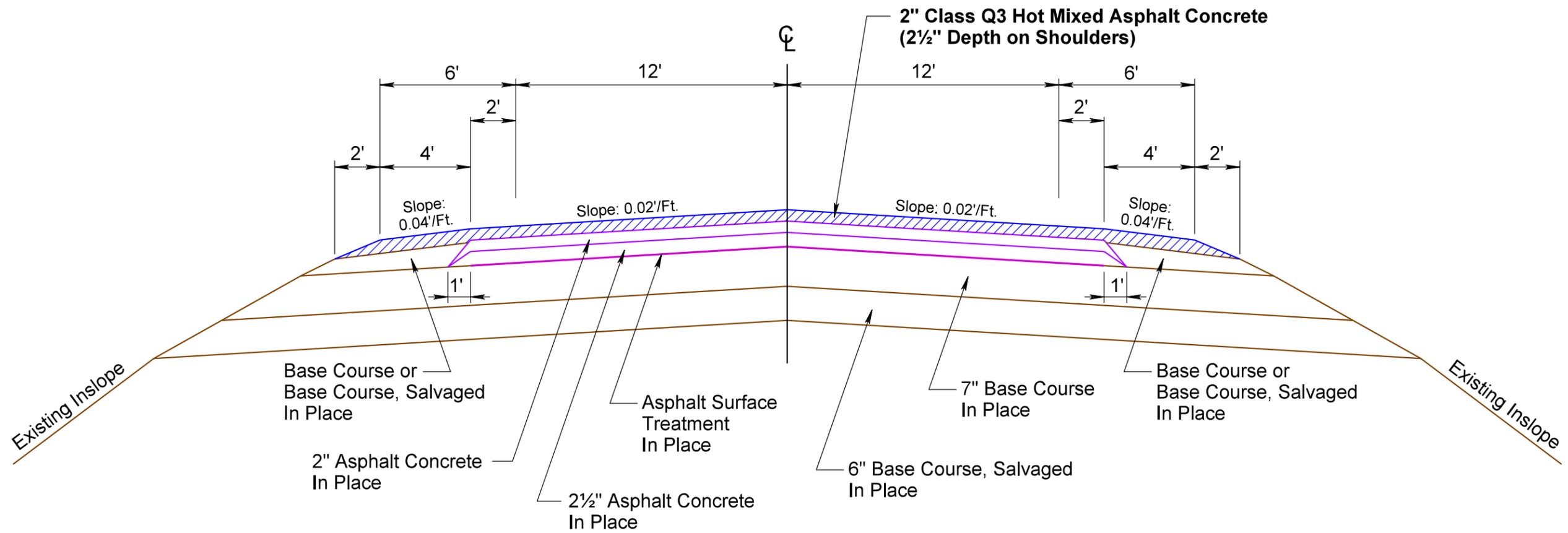
Plotting Date: 02/06/2015

# TYPICAL RESURFACING SECTION

## NH 0281(109)145

### SECTION 2

99+92 to 115+50



PLOT SCALE - 1:5

PLOT NAME - 3

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PLOTTED FROM - TRMINT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	6	75

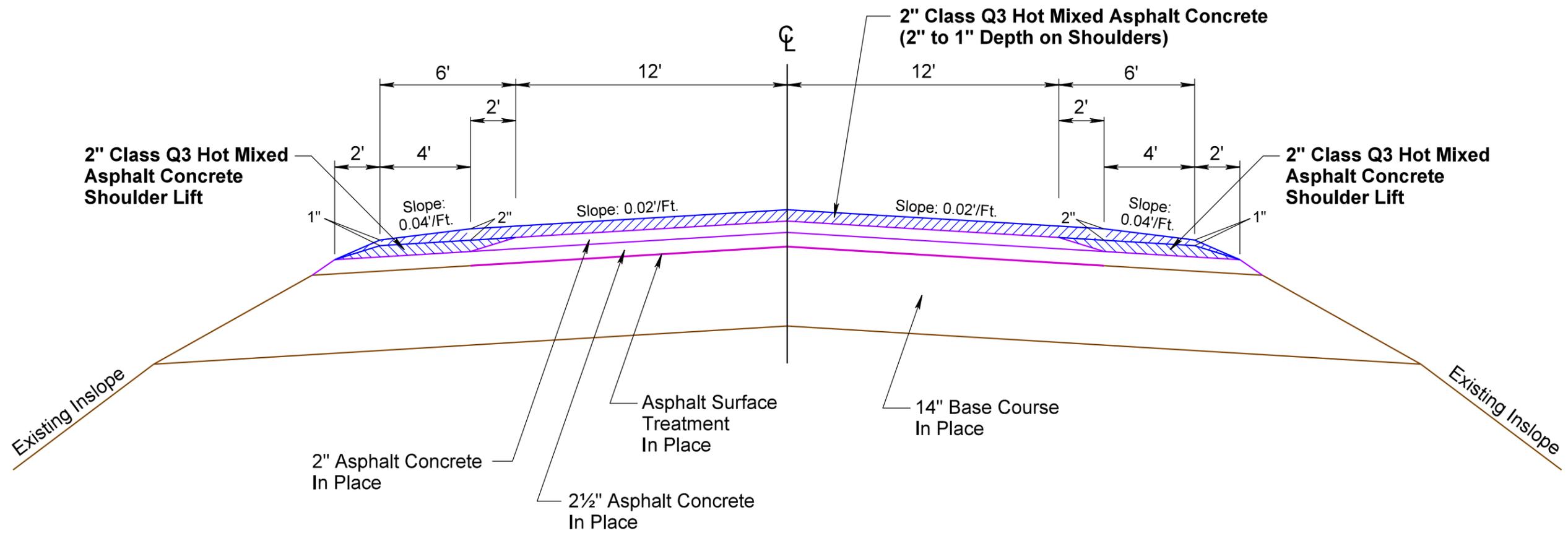
Plotting Date: 02/06/2015

# TYPICAL RESURFACING SECTION

## NH 0281(109)145

### SECTION 3

31+58 (2nd) to 53+00 (2nd)



PLOT SCALE - 1:5

PLOTTED FROM - TRMINT15

PLOT NAME - 4

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# TYPICAL RESURFACING SECTION

## NH 0281(109)145 SECTION 4

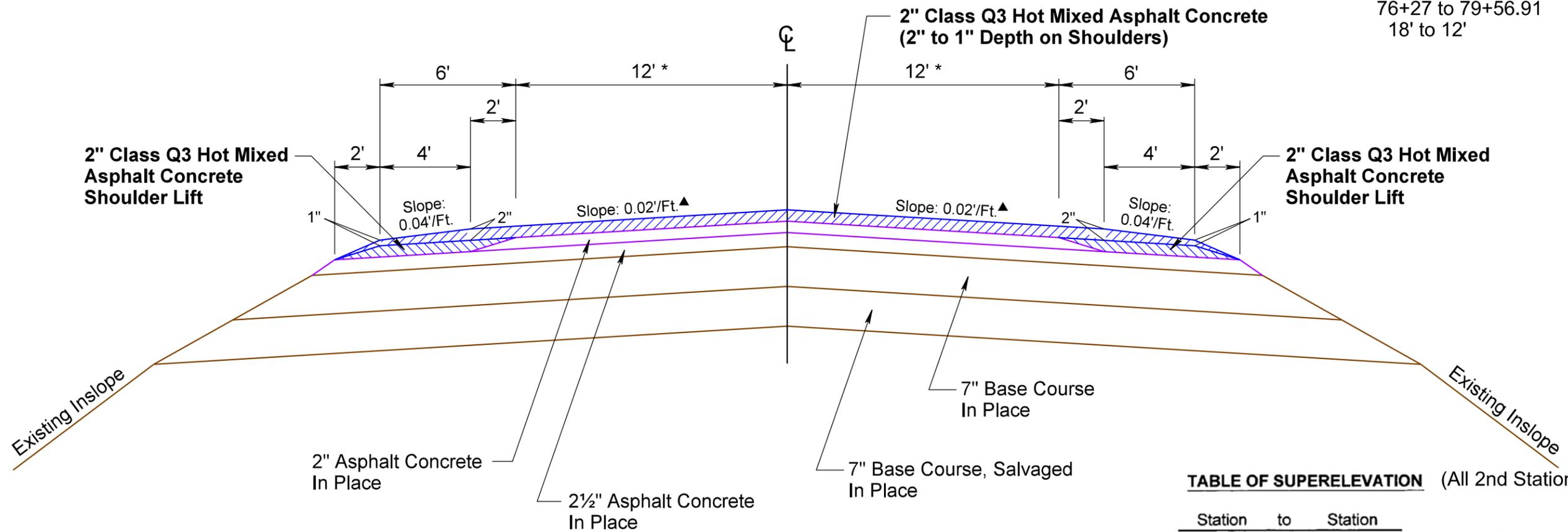
53+00 (2nd) to 79+56.91 (2nd)  
82+65.67 (2nd) to 102+28 (2nd)

\* Transitions:  
(All 2nd Stationing)

71+04 to 74+73  
12' to 18'

74+73 to 76+27  
18'

76+27 to 79+56.91  
18' to 12'



**TABLE OF SUPERELEVATION** (All 2nd Stationing)

Station	to	Station	
53+00.00		65+28.91	- Normal Crown Section
65+28.91		67+98.91	- Superelevation Transition
67+98.91		76+27.66	- 3°30' Curve Lt 0.060 Superelevation Rate Point of Rotation 12' Lt of CL
76+27.66		78+97.66	- Superelevation Transition
78+97.66		86+47.71	- Normal Crown Section
86+47.71		89+17.71	- Superelevation Transition
89+17.71		97+05.65	- 2°30' Curve Rt 0.059 Superelevation Rate Point of Rotation 12' Rt of CL
97+05.65		99+75.65	- Superelevation Transition
99+75.65		104+00.00	- Normal Crown Section

▲ Except in Superelevation Sections (Match Existing) See Table of Superelevation

# RATES OF MATERIALS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	8	75

**Section 1**  
**NH 0281(110)105**  
 11+90.00 to 649+22.00 (less 25' for one RR Xing)

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

**2" CLASS Q3 HOT MIXED ASPHALT CONCRETE**

Crushed Aggregate	2711 Tons
PG 64-28 Asphalt Binder	161 Tons
	<b>TOTAL: 2872 Tons</b>
Hydrated Lime	29 Tons
	<b>TOTAL: 2901 Tons</b>

The exact proportions of these materials will be determined on construction.

SS-1h or CSS-1h Asphalt for Tack at the rate of 5.1 tons applied 41 feet wide (Rate = 0.05 gallon per square yard).

**FLUSH SEAL**

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 5 tons applied 40 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 52 tons applied 22 feet wide (Rate = 8 pounds per square yard).

**Section 3**  
**NH 0281(109)145**  
 31+58.00 (2nd) to 53+00.00 (2nd)

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

**2" CLASS Q3 HOT MIXED ASPHALT CONCRETE SHOULDER LIFT**

	NB SHOULDER	SB SHOULDER
Crushed Aggregate	6.99 Tons	6.99 Tons
PG 64-28 Asphalt Binder	0.41 Ton	0.41 Ton
	<b>TOTALS: 7.40 Tons</b>	<b>7.40 Tons</b>
Hydrated Lime	0.07 Ton	0.07 Ton
	<b>TOTALS: 7.47 Tons</b>	<b>7.47 Tons</b>

The exact proportions of these materials will be determined on construction.

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.04 ton applied 18 feet wide (9 feet wide each shoulder) (Rate = 0.05 gallon per square yard).

**2" CLASS Q3 HOT MIXED ASPHALT CONCRETE**

Crushed Aggregate	40.75 Tons
PG 64-28 Asphalt Binder	2.42 Tons
	<b>TOTAL: 43.17 Tons</b>
Hydrated Lime	0.43 Ton
	<b>TOTAL: 43.60 Tons</b>

The exact proportions of these materials will be determined on construction.

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.1 ton applied 41 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 40 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 0.98 ton applied 22 feet wide (Rate = 8 pounds per square yard).

**Section 2**  
**NH 0281(109)145**  
 99+92.00 to 115+50.00

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

**2" CLASS Q3 HOT MIXED ASPHALT CONCRETE**

Crushed Aggregate	46.55 Tons
PG 64-28 Asphalt Binder	2.76 Tons
	<b>TOTAL: 49.31 Tons</b>
Hydrated Lime	0.49 Ton
	<b>TOTAL: 49.80 Tons</b>

The exact proportions of these materials will be determined on construction.

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.1 ton applied 41 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 40 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 0.98 ton applied 22 feet wide (Rate = 8 pounds per square yard).

**Section 4**  
**NH 0281(109)145**  
 53+00.00 (2nd) to 102+28.00 (2nd) (less 245' for one bridge & less 63' for two appr/sleeper slabs)

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

**2" CLASS Q3 HOT MIXED ASPHALT CONCRETE SHOULDER LIFT**

	NB SHOULDER	SB SHOULDER
Crushed Aggregate	6.99 Tons	6.99 Tons
PG 64-28 Asphalt Binder	0.41 Ton	0.41 Ton
	<b>TOTALS: 7.40 Tons</b>	<b>7.40 Tons</b>
Hydrated Lime	0.07 Ton	0.07 Ton
	<b>TOTALS: 7.47 Tons</b>	<b>7.47 Tons</b>

The exact proportions of these materials will be determined on construction.

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.04 ton applied 18 feet wide (9 feet wide each shoulder) (Rate = 0.05 gallon per square yard).

**2" CLASS Q3 HOT MIXED ASPHALT CONCRETE**

Crushed Aggregate	40.75 Tons
PG 64-28 Asphalt Binder	2.42 Tons
	<b>TOTAL: 43.17 Tons</b>
Hydrated Lime	0.43 Ton
	<b>TOTAL: 43.60 Tons</b>

The exact proportions of these materials will be determined on construction.

SS-1h or CSS-1h Asphalt for Tack at the rate of 0.1 ton applied 41 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 40 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 0.98 ton applied 22 feet wide (Rate = 8 pounds per square yard).

**TABLE OF PROJECT STATIONING**

PROJECT SECTION NUMBER	STATION TO	STATION	LENGTH	GROSS SECTION LENGTHS	EXCEPTION LENGTHS	BRIDGE LENGTH	NET SECTION LENGTHS		
1 NH 0281(110)105	11+90.00	to 649+22.00	63732.00'	63732.00'	25.00'		63707.00' 12.066 mi.		
2 NH 0281(109)145	99+92.00	to 115+50.00	1558.00'	1558.00'			1558.00' 0.295 mi.		
3 NH 0281(109)145	31+58.00 (2nd)	to 53+00.00 (2nd)	2142.00'	2142.00'			2142.00' 0.406 mi.		
4 NH 0281(109)145	53+00.00 (2nd)	to 102+28.00 (2nd)	4928.00'	4928.00'	31.66' 31.66'	245.44'	4619.24' 0.875 mi.		
<b>NH 0281(110)105</b>				<b>63732'</b>	<b>12.070 mi.</b>	<b>25'</b>	<b>0.004 mi.</b>	<b>63707'</b>	<b>12.066 mi.</b>
<b>NH 0281(109)145</b>				<b>8628'</b>	<b>1.634 mi.</b>	<b>63'</b>	<b>0.012 mi.</b>	<b>8320'</b>	<b>1.576 mi.</b>
<b>Grand Totals</b>				<b>72360'</b>	<b>13.704 mi.</b>	<b>88'</b>	<b>0.016 mi.</b>	<b>72027'</b>	<b>13.642 mi.</b>

**TABLE OF MATERIALS QUANTITIES**

SECTION PROJECT NO.	UNCL. EXC. DIG-OUTS	CONTRACTOR FURNISHED BORROW	BASE COURSE	COLD MILLING ASPHALT CONCRETE	CLASS Q3 HOT MIXED ASPHALT CONCRETE SHOULDER LIFT	PG 64-28 ASPHALT BINDER	HYDRATED LIME	CLASS Q3 HOT MIXED ASPHALT CONCRETE	PG 64-28 ASPHALT BINDER	HYDRATED LIME	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL
	CuYd	CuYd	Ton	SqYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
1 NH 0281(110)105	603	-	1207	-	-	-	-	35003	1940.8	346.6	61.5	60.3	627
2 NH 0281(109)145	15	-	29	-	-	-	-	776	43.0	7.7	1.6	1.4	15
3 NH 0281(109)145	20	-	40	-	320	17.7	3.2	934	51.8	9.2	3.0	1.9	21
4 NH 0281(109)145	44	-	87	-	690	38.3	6.8	2014	111.7	19.9	6.4	4.2	45
<b>Subtotals:</b>	<b>682</b>	<b>-</b>	<b>1363</b>	<b>-</b>	<b>1010</b>	<b>56</b>	<b>10.0</b>	<b>38727</b>	<b>2147.3</b>	<b>383.4</b>	<b>72.5</b>	<b>67.8</b>	<b>708</b>
<b>Additional Quantities:</b>	<b>-</b>	<b>435</b>	<b>2316</b>	<b>4766</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>5045</b>	<b>279.7</b>	<b>49.9</b>	<b>11.6</b>	<b>1.2</b>	<b>21</b>
<b>Totals:</b>	<b>682</b>	<b>435</b>	<b>3679</b>	<b>4766</b>	<b>1010</b>	<b>56</b>	<b>10.0</b>	<b>43772</b>	<b>2427.0</b>	<b>433.3</b>	<b>84.1</b>	<b>69.0</b>	<b>729</b>
<b>NH 0281(110)105 SUBTOTALS:</b>	<b>603</b>	<b>-</b>	<b>1207</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>35003</b>	<b>1940.8</b>	<b>346.6</b>	<b>61.5</b>	<b>60.3</b>	<b>627</b>
<b>NH 0281(110)105 ADDITIONALS:</b>	<b>-</b>	<b>435</b>	<b>2096</b>	<b>2312</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>4313</b>	<b>239.1</b>	<b>42.7</b>	<b>10.0</b>	<b>0.8</b>	<b>15</b>
<b>NH 0281(110)105 TOTALS:</b>	<b>603</b>	<b>435</b>	<b>3303</b>	<b>2312</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>39316</b>	<b>2179.9</b>	<b>389.3</b>	<b>71.5</b>	<b>61.1</b>	<b>642</b>
<b>NH 0281(109)145 SUBTOTALS:</b>	<b>79</b>	<b>-</b>	<b>156</b>	<b>-</b>	<b>1010</b>	<b>56.0</b>	<b>10.0</b>	<b>3724</b>	<b>206.5</b>	<b>36.8</b>	<b>11.0</b>	<b>7.5</b>	<b>81</b>
<b>NH 0281(109)145 ADDITIONALS:</b>	<b>-</b>	<b>-</b>	<b>220</b>	<b>2454</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>732</b>	<b>40.6</b>	<b>7.2</b>	<b>1.6</b>	<b>0.4</b>	<b>6</b>
<b>NH 0281(109)145 TOTALS:</b>	<b>79</b>	<b>-</b>	<b>376</b>	<b>2454</b>	<b>1010</b>	<b>56.0</b>	<b>10.0</b>	<b>4456</b>	<b>247.1</b>	<b>44.0</b>	<b>12.6</b>	<b>7.9</b>	<b>87</b>

**TABLE OF ADDITIONAL QUANTITIES**

CONTRACTOR FURNISHED BORROW	BASE COURSE	COLD MILLING ASPHALT CONCRETE	CLASS Q3 HOT MIXED ASPHALT CONCRETE	PG 64-28 ASPHALT BINDER	HYDRATED LIME	SS-1h/ CSS-1h ASPH. FOR TACK	SS-1h/ CSS-1h ASPH. FOR FLUSH SEAL	SAND FOR FLUSH SEAL					
LOCATION		CuYd	Ton	SqYd	Ton	Ton	Ton	Ton	Ton				
Mainline Transitions													
Sec. 1	11+90 to 15+80			Width 12' to 0'	-	-	-	29	1.6	0.3	0.05	0.05	1
Sec. 1	647+42 to 648+42			24'	-	-	-	11	0.6	0.1	-	-	-
Sec. 4	71+04 (2nd) to 74+73 (2nd)			0' to 12'	-	-	-	28	1.6	0.3	0.05	0.05	1
Sec. 4	74+73 (2nd) to 76+27 (2nd)			12'	-	-	-	23	1.3	0.2	0.05	0.05	1
Sec. 4	76+27 (2nd) to 79+57 (2nd)			12' to 0'	-	-	-	25	1.4	0.2	0.05	0.05	1
Begin/End Projects													
		-	-	1494	-	-	-	-	-	-	-	-	-
Bridge Ends													
		-	-	1458	41	2.3	0.4	0.10	0.10	-	-	-	-
Culvert Work													
		435	-	-	-	-	-	-	-	-	-	-	-
North Approach to RR Crossing													
		-	-	711	82	4.5	0.8	0.20	-	-	-	-	-
South Approach to RR Crossing													
		-	-	711	82	4.5	0.8	0.20	-	-	-	-	-
Guardrail Locations													
See Guardrail Table													
		-	-	284	54	3.0	0.5	-	-	-	-	-	-
2 Mailbox Turnouts													
		-	6	-	2	0.1	-	-	-	-	-	-	-
Resurface to ROW													
		-	-	108	147	8.2	1.5	0.20	0.20	-	-	-	4
Resurface to End of Radius													
		-	600	-	429	23.8	4.2	0.70	0.70	-	-	-	13
Pads													
		-	30	-	-	-	-	-	-	-	-	-	-
		-	40	-	-	-	-	-	-	-	-	-	-
		-	140	-	-	-	-	-	-	-	-	-	-
		-	1480	-	-	-	-	-	-	-	-	-	-
		-	20	-	-	-	-	-	-	-	-	-	-
<b>TOTALS:</b>		<b>435</b>	<b>2316</b>	<b>4766</b>	<b>953</b>	<b>52.9</b>	<b>9.3</b>	<b>1.6</b>	<b>1.2</b>	<b>21</b>			

NOTES: The tonnage shown above for Base Course is based on a compacted depth of 4 inches for Guardrail Locations and Mailbox Turnouts and 2 inches for other locations.

The tonnage shown above for Class Q3 Hot Mixed Asphalt Concrete for intersecting roads is based on a compacted depth of 3" to 2" in Section 1, 2" in Section 2, and 3" to 2" in Sections 3 & 4.

The tonnage shown above for Class Q3 Hot Mixed Asphalt Concrete for other locations is based on a compacted depth of 2".

The above quantities are included in the Estimate of Quantities.

# SUMMARY OF ASPHALT CONCRETE

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	11	75

## NH 0281(110)105

CLASS Q3 HOT MIXED ASPHALT CONCRETE WITH SPECIFIED DENSITY COMPACTION TONS	CLASS Q3 HOT MIXED ASPHALT CONCRETE WITHOUT SPECIFIED DENSITY COMPACTION TONS
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### Section 1

24' Finished Roadway Surface	19050	-
6' Shoulders & Bevels	-	15953
<b>Section 1 Totals:</b>	<b>19050</b>	<b>15953</b>

Section 1 Additional Quantities for spot leveling	-	3620
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#### Table of Additional Quantities

Mainline Transitions	40	-
Railroad Approaches	164	-
Table of Additional Quantities except items listed above	-	489

<b>Additional Totals:</b>	<b>204</b>	<b>489</b>
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<b>NH 0281(110)105 Totals:</b>	<b>19254</b>	<b>20062</b>
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<b>NH 0281(110)105</b>	<b>19254</b>	TONS ASPHALT CONCRETE WITH SPECIFIED DENSITY COMPACTION
	<b>20062</b>	TONS ASPHALT CONCRETE WITHOUT SPECIFIED DENSITY COMPACTION
	<b>39316</b>	TONS TOTAL

## NH 0281(109)145

CLASS Q3 HOT MIXED ASPHALT CONCRETE SHOULDER LIFT WITHOUT SPECIFIED DENSITY COMPACTION TONS	CLASS Q3 HOT MIXED ASPHALT CONCRETE WITH SPECIFIED DENSITY COMPACTION TONS	CLASS Q3 HOT MIXED ASPHALT CONCRETE WITHOUT SPECIFIED DENSITY COMPACTION TONS
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### Section 2

24' Finished Roadway Surface	-	466	-
6' Shoulders & Bevels	-	-	310
<b>Section 2 Totals:</b>	<b>-</b>	<b>466</b>	<b>310</b>

Section 2 Additional Quantities for spot leveling	-	-	88
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### Section 3

24' Finished Roadway Surface	-	640	-
6' Shoulders & Bevels	320	-	294
<b>Section 3 Totals:</b>	<b>320</b>	<b>640</b>	<b>294</b>

Section 3 Additional Quantities for spot leveling	-	-	122
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### Section 4

24' Finished Roadway Surface	-	1381	-
6' Shoulders & Bevels	690	-	633
<b>Section 4 Totals:</b>	<b>690</b>	<b>1381</b>	<b>633</b>

Section 4 Additional Quantities for spot leveling	-	-	262
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#### Table of Additional Quantities

Mainline Transitions	-	76	-
Bridge Ends	-	41	-
Table of Additional Quantities except items listed above	-	-	143

<b>Additional Totals:</b>	<b>-</b>	<b>117</b>	<b>143</b>
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<b>NH 0281(109)145 Totals:</b>	<b>1010</b>	<b>2604</b>	<b>1852</b>
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<b>NH 0281(109)145</b>	<b>2604</b>	TONS ASPHALT CONCRETE WITH SPECIFIED DENSITY COMPACTION
	<b>2862</b>	TONS ASPHALT CONCRETE WITHOUT SPECIFIED DENSITY COMPACTION
	<b>5466</b>	TONS TOTAL

### TABLE FOR MAINLINE CULVERT WORK

Station	NH 0281(110)105 Beadle County PCN 0367  CULVERT	CONTRACTOR FURNISHED BORROW		RCP FLARED ENDS			REMOVE PIPE CULVERT		REMOVE PIPE END SECTION		REMOVE & RESET PIPE CULVERT		REMOVE & RESET PIPE END SECTION		TYPE 2 OBJECT MARKERS BACK TO BACK EACH	TYPE 2 OBJECT MARKERS (SINGLE) EACH	CLEANOUT PIPE CULVERT EACH	
		CUYD		FT			FT		FT		FT		EACH					
		L	R	L	R	L	R	L	R	L	R	L	R	L				R
						EACH	EACH											
17+93	24" x 164' RCP 2 FE	10	5									6		1	1	2		
46+04	36" x 66' RC Arch 2 FE															4		
62+82	30" x ___' RCP 2 FE	10	10									6	4	1	1	4		
69+96	Twin 48" x 56' RCP 4 FE	20										2@6=12		2		2 L		
107+85	36" x 78' CMP 2 FE															4		
133+00	42" x ___' RCP 2 FE	10										6		1		2 L		
151+71	18" x 84' RCP 2 FE	15	10									12	6	1	1	2		
173+95	2-8' x 7' x 56' RCBC															4		
200+40	30" x 56' RCP 2 FE	10	10									6	6	1	1	4		
222+25	18" x 66' RCP 2 FE	15				1	(Inlet)		1			12				1 L		
223+43	24" x 58' RCP 2 FE	10										6		1		1 L		
239+89	30" x 64' RCP 2 FE	15	10									12		1	1	4		
255+97	18" x 60' RCP 2 FE	10	5									6		1	1	2		
270+75	48" x 56' RCP 2 FE	10	10									6	6	1	1	4		
281+55	18" x 60' RCP 2 FE		5											1	1 R		1	
298+80	Twin 42" x 56' RCP 4 FE	20	20									2@6=12	2@6=12	2	2	4		
325+07	48" x 88' RCP 2 FE															4		
343+15	18" x 56' RCP 2 FE	15										14		1		1 L		
356+54	24" x 56' RCP 2 FE	10										8		1		1 L		
380+54	24" x 62' RCP 2 FE (No Work)																	
400+70	18" x 70' RCP 2 FE (No Work)																	
416+67	3-8' x6' x 61' RCBC															4		
434+17	108" x 176' CM Plate Pipe															4		
458+45	36" x ___' RC Arch 2 FE	10	10									6	6	1	1	4		
483+04	24" x 92' RCP 2 FE	15										8		1		1 L		
492+90	36" x 58' RCP 2 FE															4		
498+41	30" x ___' RCP 2 FE	10										6		1		2 L		
521+41	24" x ___' RCP 2 FE	10										8		1		1 L		
545+39	18" x 70' RCP 2 FE	10	10									6	6	1	1	2		
562+14	36" x 60' RCP 2 FE															4		
571+50	18" x 60' RCP 2 FE	10				1	(Inlet)		1			6				1 L	1	
579+88	18" x 70' RCP 2 FE	10	5			1	(Inlet)		1			6			1	2		
592+17	18" x 64' RCP 2 FE	15	5									12		1	1	2		
599+80	30" x ___' RCP	10	20	6				1	1	6			18			4		
608+32	30" x 54' RCP 2 FE	10	10									6	6	1	1	4		
646+00	42" x 48' RC Arch 2 FE (No Work)																	
<b>TOTALS:</b>		435		6	3	2		6	3			258		37		20	70	2

### TABLE FOR REMOVAL AND INSTALLATION OF GUARDRAIL AND RELATED ITEMS

LOCATION	REMOVE 3 CABLE GUARDRAIL	REMOVE BEAM GUARDRAIL	REMOVE 3 CABLE GUARDRAIL ANCHOR ASSEMBLY	REMOVE W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	CLASS Q3 HOT MIXED ASPHALT CONCRETE	3 CABLE GUARDRAIL	3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY	3 CABLE GUARDRAIL ANCHOR ASSEMBLY	STRAIGHT DOUBLE CLASS A THRIE BEAM GUARDRAIL WITH WOOD POSTS	STRAIGHT CLASS A W BEAM GUARDRAIL WITH WOOD POSTS	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	
	Ft	Ft	Each	Each	Ton	Ft	Each	Each	Ft	Ft	Each	Each	
<b>BRIDGE CORNER LANE-SHOULDER</b>													
<b>STR.NO. 58-101-321</b>													
<b>MRM 146.39</b>													
Begin Bridge L	NBL Shoulder	206	81.25	2	1	13	244	1	1	12.5	62.5	1	1
Begin Bridge R	SBL Shoulder	214	81.25	2	1	13	244	1	1	12.5	62.5	1	1
End Bridge L	NBL Shoulder	216	81.25	2	1	12	244	1	1	12.5	62.5	1	1
End Bridge R	SBL Shoulder	326	81.25	2	1	16	356	1	1	12.5	62.5	1	1
<b>NH 0281(109)145 TOTALS:</b>		<b>962</b>	<b>325</b>	<b>8</b>	<b>4</b>	<b>54</b>	<b>1088</b>	<b>4</b>	<b>4</b>	<b>50</b>	<b>250</b>	<b>4</b>	<b>4</b>

### 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						
				BEAM		CABLE				
				(M) #	(M) #	(E) #	(B) #	(C) #		
<b>BRIDGE CORNER LANE-SHOULDER</b>				Yellow	White	Yellow	White			
<b>NH 0281(109)145</b>										
<b>STR.NO. 58-101-321</b>										
<b>MRM 146.39</b>										
Begin Bridge L	NBL Shoulder	1	1		2		4			
Begin Bridge R	SBL Shoulder	1	1		2		4			
End Bridge L	NBL Shoulder	1	1		2		4			
End Bridge R	SBL Shoulder	1	1		2		6			
<b>TOTALS</b>				<b>4</b>	<b>-</b>	<b>4</b>	<b>-</b>	<b>8</b>	<b>-</b>	<b>18</b>
				<b>26</b>						

# - For KEY, Refer to Standard Plate 632.40 - Sheet 1 of 4.  
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.

### PROJECT WORK HOURS

The Contractor may perform work on the roadway during daylight hours only, unless additional hours are approved by the Engineer. Daylight hours are considered to be sunrise until sunset. Traffic shall be returned to normal driving lanes during nonworking hours.

### 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.

### COORDINATION BETWEEN CONTRACTORS

A separate contract for Project PP 0281(101)116, Beadle County - PCN 03WL will be awarded to another Contractor for Railroad Crossing Replacement / Raise on US281 at MRM 116.97, Sta. 21+95.5, 1076.1' South of US14.

The railroad crossing replacement / raise must precede the asphalt concrete resurfacing. Therefore, the Contractor shall coordinate the asphalt concrete resurfacing work to follow the railroad crossing replacement/raise work and not interfere with or hinder the progress of the work performed by other Contractors on the railroad crossing replacement/raise project.

The Railroad Company expects the crossing raise work to begin at the end of May and be accomplished within 9 or 10 days. The Railroad Company contact is currently Derek Knopp, phone 605-215-8745.

### RAILROAD CROSSING

The Contractor is to coordinate work with the Railroad Company regarding any work to be done adjacent to the railroad tracks and give 30 days notice to the Railroad Company in advance of required flagging dates. See Special Provision for Working on Railroad Company Right of Way.

### TYPE III FIELD LABORATORY

The lab shall be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection shall be provided with a multi-port wireless router. The internet connection shall be a minimum speed of 512 Kb unless limited by job location and approved by the DOT. Prior to installing the wireless router the Contractor shall submit the wireless router's technical data to the Area Office to check for compatibility with the state's computer equipment. The internet connection is intended for State personnel use only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer. These items shall be incidental to the contract unit price per each for Type III Field Laboratory.

Type III Field Laboratory will only be paid for once while completing all three projects: NH 0281(110)105, NH 0281(109)145 and NH 0014(198)320. The field laboratory may require relocating during the projects and cost for this work will be incidental to the contract unit price per each for Type III Field Laboratory.

### STORAGE UNIT

The Contractor shall provide a storage unit such as a portable storage container or a semi-trailer meeting the minimum size requirements from the table below:

Project Total Asphalt Concrete Tonnage	Minimum Internal Size (Cu Ft)	Minimum External Size (L x W x H)
Less than 50,000 ton	1,166	20' x 8' x 8.6' std
More than 50,000 ton	2,360	40' x 8' x 8.6' std
All Gyratory Controlled QC/Q Projects	2,360	40' x 8' x 8.6' std

The storage unit is intended for use only by the Engineer for the duration of the project. The QC lab personnel or the Contractor will not be allowed to use the storage container while it is on the project, without permission of the Engineer.

The storage unit shall be on site and operational prior to asphalt concrete production. Upon completion of asphalt concrete production, the Engineer will notify the Contractor when the storage unit can be removed from the project. The storage unit use will not exceed 30 calendar days from the completion of asphalt concrete production. The storage unit will remain the property of the Contractor.

The storage unit shall be weather proof and shall be set in a level position. The storage unit shall be able to be locked with a padlock.

The storage unit shall be placed adjacent to the QA lab, as approved by the Engineer.

The following shall apply when the storage unit provided on the project is a portable storage container:

1. The portable storage container shall be constructed of steel.
2. The portable storage container shall be set such that it is raised above the surrounding ground level to keep water from ponding under or around the storage container.

The following shall apply when the storage unit provided on the project is a semi-trailer:

1. A set of steps and hand railings shall be provided at the exterior door.
2. If the floor of the semi-trailer is 18 inches or more above the ground, a landing shall be constructed at the exterior door. The minimum dimensions for the landing shall be 4 feet by 5 feet. The top of the landing shall be level with the threshold or opening of the doorway.
3. The semi-trailer may be connected to the QA lab by a stable elevated walkway. The walkway shall be a minimum of 48 inches wide and contain handrails installed at 32 inches above the deck of the walkway. The walkway shall be constructed such that it is stable and the deck does not deform during use and allows for proper door operation. Walkway construction shall be approved by the Engineer.

Cost for furnishing, maintaining and removing the storage unit including labor, equipment, material and any necessary walkways, landings, stairways and handrails shall be included in the contract unit price per each for Storage Unit.

Storage Unit will only be paid for once while completing all three projects: NH 0281(110)105, NH 0281(109)145 and NH 0014(198)320. The storage unit may require relocating during the projects and cost for this work will be incidental to the contract unit price per each for Storage Unit.

### FLEXIBLE PAVEMENT SMOOTHNESS SPECIAL PROVISION

All sections, not excluded by the Special Provision for Flexible Pavement Smoothness, will be profiled as 1 opportunity.

The following informational smoothness data for PCN 0367 was collected on January 27<sup>th</sup>, 2015:

Lane Location:	NBL	SBL
Max. 1/10 mile IRI (in/mi):	207	243
Min. 1/10 mile IRI (in/mi):	87	108
Average IRI (in/mi):	152	168
Standard Deviation (in/mi):	24	26

The following informational smoothness data for PCN 04W8 was collected on January 27<sup>th</sup>, 2015:

Lane Location:	NBL	SBL
Max. 1/10 mile IRI (in/mi):	200	204
Min. 1/10 mile IRI (in/mi):	56	50
Average IRI (in/mi):	109	113
Standard Deviation (in/mi):	42	40

For more information, please contact: Shea Lemmel  
Pavement Engineer  
Phone: (605) 773-2730  
Email: [Shea.Lemmel@state.sd.us](mailto:Shea.Lemmel@state.sd.us)

### 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.

### 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.

### REMOVE AND REPLACE TOPSOIL

Prior to beginning any grading operations (culvert work), a 4" depth of topsoil shall be removed and stockpiled from the construction work areas. On completion of construction operations this salvaged topsoil shall be spread evenly over the construction areas.

Cost for removing and replacing the topsoil shall be incidental to the contract lump sum price for Remove and Replace Topsoil.

**CONTRACTOR FURNISHED BORROW**

The Contractor shall provide a suitable site for Contractor furnished borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer. The plans quantity for Contractor Furnished Borrow as shown in the Estimate of Quantities will be the basis of payment for this item.

Compaction of the fill material shall be to the satisfaction of the Engineer.

It is not anticipated that water for compaction will be required; however, if in the opinion of the Engineer the fill material is extremely dry, water may be ordered and placed to the satisfaction of the Engineer. Cost for water shall be incidental to the contract unit price per cubic yard for Contractor Furnished Borrow.

Restoration of the Contractor furnished borrow site shall be the responsibility of the Contractor.

**CULVERT CLEANOUT**

Material in existing culverts as listed in the Table for Mainline Culvert Work shall be cleaned out by water flushing or other approved methods.

It is the responsibility of the Contractor to visit the site to determine the extent of culvert cleaning work required.

Cost for this work shall be included in the contract unit price per each for Cleanout Pipe Culvert.

If it is determined by the Engineer at the time of construction that the Culvert Cleanout is not required, no payment will be made. Cleaning out the end sections of culvert does not constitute Culvert Cleanout.

The Contractor shall implement appropriate sediment control measures prior to water flushing in order to prevent discharges from project boundaries, and to comply with the Storm Water Permit.

**TIE BOLTS FOR RCP/RCP ARCH CULVERTS**

Tie Bolts shall be installed on all new/reset culvert and on new/reset culvert ends (requires connection from existing culvert to new culvert).

For informational purposes:

Field drilling will be required to install the tie bolts on reset culvert, on reset culvert ends and on existing culvert when installing a new/reset end section.

Cost for removing tie bolts, drilling tie bolt holes and furnishing and installing tie bolts shall be incidental to the contract unit prices for installing or resetting RCP Culverts and End Sections. Existing tie bolts may be salvaged and reused if condition is acceptable to the Engineer.

**EMBANKMENT ADJACENT TO CULVERTS**

Earth embankment adjacent to the existing culverts/end sections shown in the Table of Mainline Culvert Work shall be removed prior to removing the culvert/end sections. Upon installation/reset of the culvert/end sections, the earth embankment shall be replaced and compacted adjacent to the culvert/end sections.

Cost for removing, replacing and compacting the earth embankment shall be included in the contract unit price per cubic yard for Contractor Furnished Borrow.

**EXCAVATION OF UNSTABLE MATERIAL**

Included in the Estimate of Quantities are 50 cubic yards per mile of Unclassified Excavation, Dugouts for the necessary removal of unstable material.

Backfill shall be paid for at the contract unit price per ton for Base Course.

**BASE COURSE**

Material left over from Cold Milling Asphalt Concrete operations may be used as Base Course at any of the locations specified for Base Course; however, it must first be blended 50/50 with virgin Base Course at no additional cost for the blending.

Included in the Estimate of Quantities are 100 tons per mile of Base Course for backfill of the Unclassified Excavation, Dugouts.

To ensure water can drain from the digout, the Base Course shall be placed so that it is daylighted to the inslope. If the material cannot be daylighted to the inslope, a drain tube shall be placed at the bottom of the digout and an outlet provided to the closest available point. Cost for the drain tube and associated work shall be incidental to the contract unit price per ton for Base Course.

**WATER FOR COMPACTION**

Cost for water for compaction of the Base Course 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 Asphalt Concrete operations ahead of asphalt concrete laydown will be limited by particular job conditions and be subject to approval of the Engineer.

The requirement for a traveling stringline shall be waived.

If resurfacing as per the typical section cannot be placed immediately after cold milling at project ends, bridge approaches and at the railroad crossing, 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.

Three intersecting roads (64+40.6 R, 328+60.9 L & R) in Section 1 shall be milled in at the ROW line so that additional surfacing may be placed at these locations. (Estimated Quantity 108 SqYds).

Existing asphalt concrete beneath the four existing guardrail installations shall be milled to a depth of 2" to allow for placement of the new guardrail embankment surfacing (Estimated Quantity 284 SqYds).

Milled material not reused on the project shall become the property of the Contractor for disposal.

Cold milling in areas that may require additional effort shall be incidental to the contract unit price per square yard for Cold Milling Asphalt Concrete. Plans quantity will be the basis of payment and no further measurement will be made. No allowance will be made for loss of expected reimbursement or loss of anticipated profit.

**COLD MILLING TAPERS**

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

The surface shall be milled full roadway width.

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

Taper depth of Cold Milling at locations shown below:

<b><u>NH 0281(110)105</u></b>			<b><u>QUANTITY</u></b>
<b><u>STA. to STA.</u></b>	<b><u>LOCATION</u></b>	<b><u>SIZE</u></b>	<b><u>SQYDS</u></b>
11+90 to 12+70	Begin NH 0281(110)105	80' L x 52' W =	462
20+23 to 21+83	North End of RR Xing	160' L x 40' W =	711
22+08 to 23+68	South End of RR Xing	160' L x 40' W =	711
648+42 to 649+22	End NH 0281(110)105	80' L x 36' W =	320
<b>TOTAL (From Milling Tapers):</b>			<b>2,204</b>
			(From Intersecting Roads): 108
			<b>NH 0281(110)105 COLD MILLING TOTAL: 2,312</b>

<b><u>NH 0281(109)145</u></b>			<b><u>QUANTITY</u></b>
<b><u>STA. to STA.</u></b>	<b><u>LOCATION</u></b>	<b><u>SIZE</u></b>	<b><u>SQYDS</u></b>
99+92 to 100+72	Begin NH 0281(109)145	80' L x 40' W =	356
77+97(2 <sup>nd</sup> ) to 79+57(2 <sup>nd</sup> )	South Bridge Approach	160' L x 42' W =	747
82+66(2 <sup>nd</sup> ) to 82+26(2 <sup>nd</sup> )	North Bridge Approach	160' L x 40' W =	711
101+48(2 <sup>nd</sup> ) to 102+28(2 <sup>nd</sup> )	End NH 0281(109)145	80' L x 40' W =	356
<b>TOTAL (From Milling Tapers):</b>			<b>2,170</b>
			(From Guardrail Installations): 284
			<b>NH 0281(109)145 COLD MILLING TOTAL: 2,454</b>

**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.

**CLASS Q3 HOT MIXED ASPHALT CONCRETE**

Mineral aggregate for Class Q3 Hot Mixed Asphalt Concrete shall conform to the requirements of the Special Provision for Gyrotory Controlled Quality Control/Quality Assurance Specifications for Hot Mixed Asphalt Concrete Pavement.

Asphalt concrete placed on the shoulders will not be compacted to a specified density. The shoulders shall be compacted using the same rolling pattern used on the adjacent mainline asphalt concrete or as directed by the Engineer.

**ADDITIONAL QUANTITIES**

Included in the Estimate of Quantities are 300 tons of Class Q3 Hot Mixed Asphalt Concrete, 16.6 tons of PG 64-28 Asphalt Binder and 3 tons of Hydrated Lime per mile for spot leveling, strengthening and repair of the existing surface.

Included in the Estimate of Quantities are 10 tons of SS-1h or CSS-1h Asphalt for Tack for surface repair and leveling areas throughout the project. (Rate = 0.05 gallon per square yard).

**FLUSH SEAL**

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

For each working day that the Flush Seal remains uncompleted after the 10 working day limitation, the Contractor will be assessed liquidated damages at the rate of \$250.00 per day.

The liquidated damages shall apply only up to the Contract Completion Date, as extended. After the Contract Completion Date, liquidated damages will be assessed in accordance with the schedule set forth in Section 8.7 of the specifications.

Application of Flush Seal may be eliminated by the Engineer. If the paved surface remains tight, the Engineer shall notify the Contractor as soon as possible that the Flush Seal is unnecessary.

The sand application shall be placed 11' wide in each lane, leaving 12" on center line and 6" on each edge line free of sand.

**RUMBLE STRIPS**

**INSTALLATION:**

Rumble strips shall be constructed according to the details of Standard Plate 320.24.

Rumble strips shall be installed in rural areas with posted speeds greater than 50 mph and are not required in urban areas. The rumble strips 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 strips 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 strips installation as detailed on the standard plates are included with the measurement and payment.

Cost for asphalt concrete rumble strips shall be included in the contract unit price per mile for Grind 12" 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 12" Rumble Strip or Stripe in Asphalt Concrete.

**REFURBISH SINGLE MAILBOXES**

Existing mailboxes shall be removed, turnouts constructed and mailboxes reset on new posts with the necessary support hardware for single mailbox assemblies. The local Postmaster will determine the recommended mounting height of the mailboxes. The Contractor shall coordinate with the Engineer on the proper postal representative to contact.

STA	BASE COURSE	CLASS Q3 HOT MIXED ASPHALT CONCRETE	REFURBISH SINGLE MAILBOX EACH
	TONS	TONS	
181+00 L	Mailbox setback on approach		1
240+33 L	3	2	1
391+87 L	3	2	1
<b>TOTALS:</b>	<b>6</b>	<b>4</b>	<b>3</b>

The Contractor will be responsible for maintaining a temporary mailbox assembly until the refurbished mailbox assembly is complete in place.

Cost for removing existing mailboxes, providing temporary mailbox assemblies, and resetting mailboxes with new posts and necessary support hardware shall be incidental to the contract unit price per each for Refurbish Single Mailbox.

**PERMANENT SEEDING**

The areas to be seeded, inoculated and mulched consist of all disturbed area for culvert work within the project limits. The areas to be seeded, inoculated and mulched are estimated at 0.6 acre.

All permanent seed shall be planted in the topsoil at a depth of ¼" to ½".

All seed broadcast must be raked or dragged in (incorporated) within the top ¼" to ½" of topsoil when possible. This requirement may be waived by the Engineer during construction when raking or dragging is deemed not feasible by conventional methods.

Cost for Permanent Seeding, Inoculum and Mulch shall be incidental to the contract lump sum price for Erosion Control.

Type G Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Flintlock, Rodan, Rosana	7
Switchgrass	Dacotah, Forestburg, Nebraska 28, Pathfinder, Summer, Sunburst, Trailblazer	3
Indiangrass	Holt, Tomahawk	3
Big Bluestem	Bison, Bonilla, Champ, Pawnee, Sunnyview	3
Oats or Spring Wheat: April through May; Winter Wheat: August through November		10
Total:		26

**SEED ORIGIN LIMITATIONS**

Grass seed furnished shall be the grass species listed in the plans. The Contractor may use one of the grass varieties listed in the plans for the specified grass species or the Contractor may use a different grass variety of the same grass species specified. If the Contractor uses a grass variety listed in the plans for the specified grass species, the grass seed origin limitations will not apply. If the Contractor uses a grass variety not listed in the plans for the specified grass species, the grass seed furnished must originate in South Dakota, North Dakota, Montana, Wyoming, Nebraska, Iowa, Minnesota, Kansas, Colorado, or Wisconsin. Grass seed grown outside this area may be approved after the Contractor has furnished written certification from three seed suppliers confirming seed grown within this area is not readily available.

**MYCORRHIZAL INOCULUM**

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

- Glomus intraradices* 25%
- Glomus mosseae* 25%
- Glomus aggregatu* 25%
- Glomus etunicatum* 25%

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. Cost for inoculating the seed shall be incidental to the contract lump sum price for Erosion Control.

The mycorrhizal inoculum shall be from the list below or an approved equal:

<u>Product</u>	<u>Manufacturer</u>
MycApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 <a href="http://www.mycorrhizae.com/">http://www.mycorrhizae.com/</a>

**DRILLS**

In addition to the drills specified in Section 730 of the Specifications, other types of drills including no-till drills will be allowed as long as they have baffles, partitions, agitators, or augers which keep the seed distributed throughout the seed box and the seed is planted at a depth of ¼" to ½".

**MULCHING (GRASS HAY OR STRAW)**

Bales with noxious weed contamination will be rejected and the Contractor will be required to remove the contaminated bales from the project.

**GENERAL NOTES**

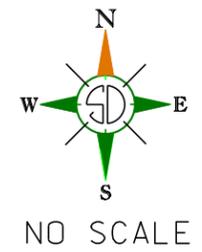
The Contractor shall be required to mow the inslopes with a rotary mower to a height of 6 inches for a distance of 14 feet from the edge of the roadway (or shoulder) for the length of the project. This work will be completed to the satisfaction of the Engineer after all construction activities are completed. Cost associated with this work shall be incidental to the contract unit prices for the various items.

# TRAFFIC CONTROL

## FIXED LOCATION SIGNING

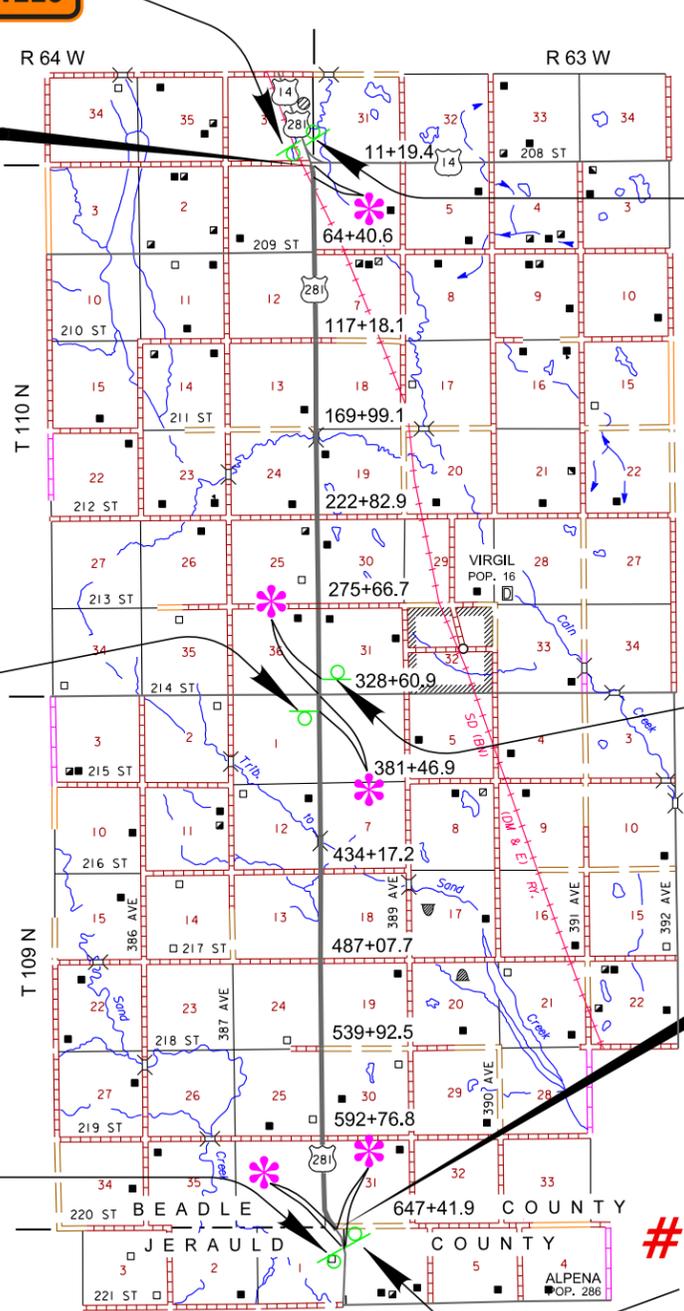
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	17	75

Plotting Date: 02/06/2015



**ROAD WORK NEXT 13 MILES** #

**BEGIN NH 0281(110)105**  
STA. 11+90  
MRM 117.00 +0.132  
(70' S of  $\varnothing$  US14)



**END ROAD WORK**

**ROAD WORK NEXT 3 MILES** #

**EQUATION**  
Sta. 115+50 Back=  
Sta. 31+58 (2nd) Ahead

**ROAD WORK NEXT 6 MILES**

**END NH 0281(110)105**  
STA. 649+22  
MRM 105.11 -0.034  
(180' S of County Line)

**ROAD WORK NEXT 13 MILES**

**END ROAD WORK**

**END NH 0281(109)145**  
STA. 102+28 (2nd)  
MRM 146.00 +0.768  
(1,640' N of  $\varnothing$  180th St)

**END ROAD WORK**

**BEGIN NH 0281(109)145**  
STA. 99+92  
MRM 145.00 +0.133  
(1,558' S of  $\varnothing$  181st St)

**ROAD WORK NEXT 3 MILES** #

**ROAD WORK NEXT 6 MILES**

**END ROAD WORK**

**KEY-** \* - 25' to 100' FROM INTERSECTION

# - 500' IN ADVANCE OF THE ROAD WORK AHEAD SIGN AT THE BEGINNING OF THE TEMPORARY TRAFFIC CONTROL ZONE

**NOTES-**

- All Ground Mounted Support signs shall remain in place until permanent pavement marking is complete.
- Construction signs shall not block the view of existing signs.
- Fixed Location signs shall be installed a minimum of 200' from any existing sign.

PLOT SCALE - 1:10000

PLOTTED FROM - TRM110115

PLOT NAME - 1

FILE - ... \TC\0367 - TRAFFIC CONTAINER.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	18	75

### SEQUENCE OF OPERATIONS

The following sequence of operations shall be adhered to. Any changes must be approved in writing by the Area Engineer prior to changes being made.

1. Install Fixed Location Signing Prior to Start of Work.
2. Complete Culvert Repair.
3. Complete Cold Milling Operations.
4. Complete Unclassified Excavation for Digouts & Backfill Operations.
5. Complete All Asphalt Concrete Strengthening & Leveling.
6. Complete Gravel Placement Operations on Approaches & Intersecting Roads.
7. Knockdown Gravel to Allow Access on Approaches & Intersecting Roads.
8. Complete Asphalt Concrete Mainline, Shoulder & Auxiliary Asphalt Paving.
9. Shape Approach Gravel.
10. Grind Rumble Strips.
11. Place Flush Seal if Required.
12. Install Permanent Pavement Marking, Grooving & Cold Applied Plastic Pavement Marking.
13. Install Permanent Signing.
14. Refurbish Mailboxes.
15. Remove Project Signing.
16. Mow Project Inslopes & Complete any Remaining Project Cleanup.

### 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 and two paved legs. If the Contractor elects to work on additional sites simultaneously, the cost for additional traffic control devices shall be included in the contract unit price per unit for Traffic Control.

### MAINTENANCE OF TRAFFIC

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

Cost for mobile work operation traffic control shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

Work activities during non-daylight hours are subject to prior approval. Work zones for asphalt paving operation and pilot car operation shall not exceed three miles in length.

### TRAFFIC CONTROL FOR ASPHALT CORING

Coring operations shall be completed during daylight hours only. Traffic control for coring operations shall be executed by following the Special Detail for Mobile Operations on Two-Lane Road.

### TEMPORARY PAVEMENT MARKING

The total length of no passing zone on NH 0281(110)105 is estimated to be 3.861 miles. The total length of no passing zone on NH 0281(109)145 is 0.667 mile.

It is estimated that 21 DO NOT PASS and 21 PASS WITH CARE signs will be required to mark the no passing zones on NH 0281(110)105 and 2 DO NOT PASS and 2 PASS WITH CARE signs will be required to mark the no passing zones on NH 0281(109)145, should the Contractor elect to use these signs.

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

Cost for furnishing, installing and removing the DO NOT PASS and PASS WITH CARE 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. A third application is also included for the cold milling locations.

#### Quantities of Temporary Pavement Markings consist of:

- One pass on top of the 2" Lift of Asphalt Concrete.
- One pass on top of the Flush Seal.

If the Flush Seal is eliminated, the application of the Temporary Pavement Marking on top of the Flush Seal will be eliminated. No adjustment in the contract unit price for Temporary Pavement Marking will be made because of a variation in quantities.

### TEMPORARY PAVEMENT MARKING (CONTINUED)

Temporary Road Markers (tabs) may be used as detailed in the Standard Specifications. Covers on the tabs shall be sufficiently secured to prevent traffic from dislodging the cover and when removed the covers shall be properly disposed. If used, the Contractor shall remove and properly dispose of the tabs 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.

Any tabs with covers removed before the flush seal shall be replaced prior to Flush Seal application. 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 (W21-1a) 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 Contractor shall advise the Engineer a minimum of two weeks prior to the application of the permanent pavement marking to allow the State to check and mark the location of no passing zones.

The application of Permanent Pavement Marking paint may not begin until 7 calendar days following completion of final surfacing (including Flush Seal if applied) and shall be completed within 14 calendar days following completion of the final surfacing.

For each working day the application of permanent pavement marking paint remains uncompleted beyond the time limits described in the preceding paragraph, the Contractor will be assessed liquidated damages at the rate of \$250.00 per day.

The liquidated damages shall apply up to the Contract Completion Date, as extended. After the completion date, liquidated damages will be assessed in accordance with Section 8.7 of the specifications, until the permanent pavement marking is completed, even though the project may be open to traffic.

# MOBILE OPERATIONS ON TWO-LANE ROAD (TYPICAL)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	19	75

Plotting Date: 02/05/2015

## 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:

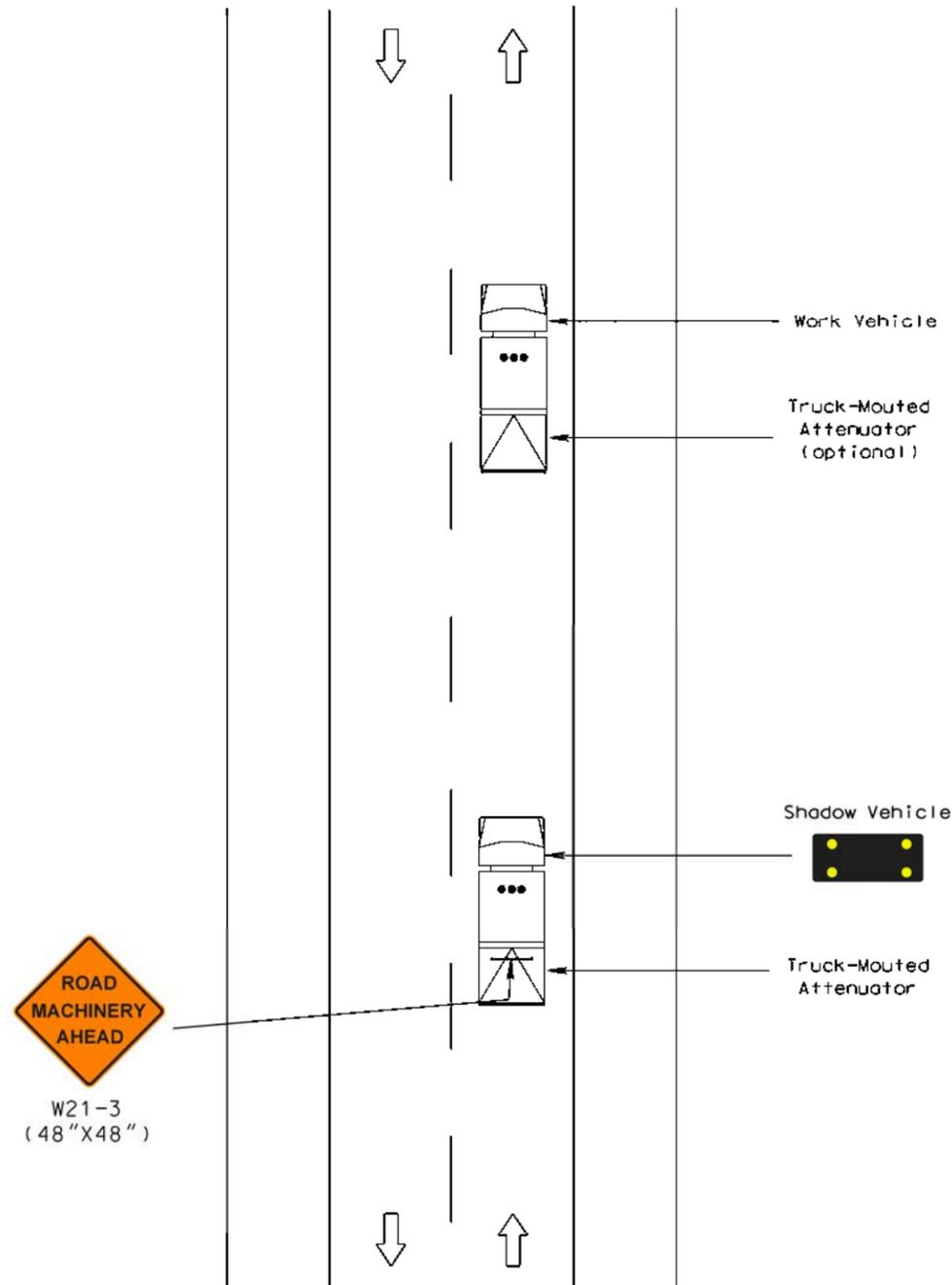
7. The distance between the work and shadow vehicles may vary according to terrain, paint drying time, and other factors.
8. Additional shadow vehicles to warn and reduce the speed of oncoming or opposing vehicular traffic may be used. Law enforcement vehicles may be used for this purpose.
9. A truck-mounted 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.



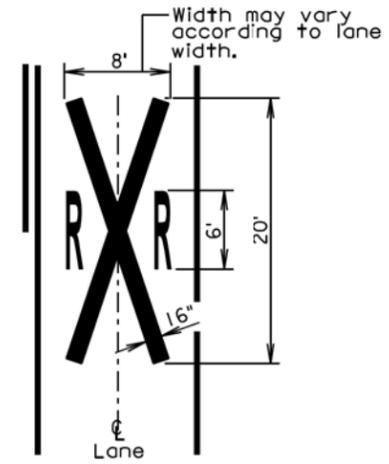
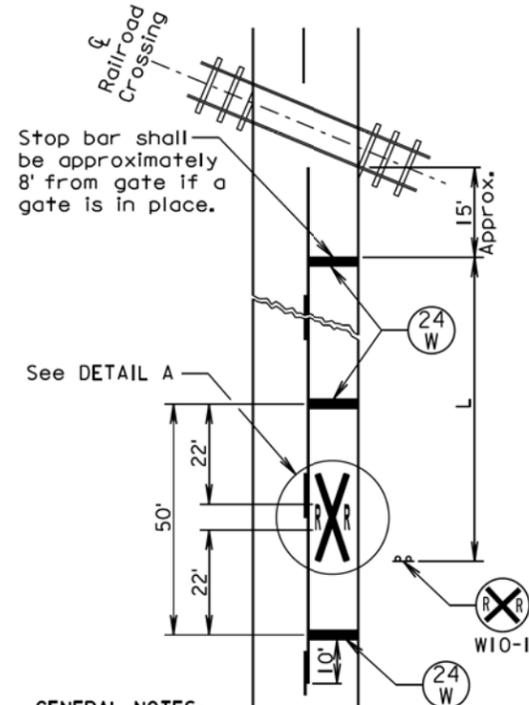
PLOT SCALE - 1:206.452

PLOT NAME - 3

FILE - ... \0367 TRAFFIC CONTAINER.DGN

KEY	ITEM
	24" White
	White

Posted Speed Limit (M.P.H.)	L (Ft.)
≤ 30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550



DETAIL A

**GENERAL NOTES:**

- The railroad crossing pavement markings shall be placed symmetrically about the centerline of the railroad crossing.
- When pavement markings are used, a portion of the RXR symbol shall be placed directly opposite of the advance warning sign W10-1.
- On multi-lane roads the transverse bands shall extend across all approach lanes and individual RXR symbols shall be placed in each approach lane.
- The railroad crossing pavement markings shall consist of all the transverse bands, stop bars, and RXR symbols.
- When pavement marking paint is used for marking the railroad crossing, all costs for furnishing and painting the markings, materials, labor, and necessary equipment shall be incidental to the contract unit price per gallon for "Pavement Marking Paint, White".
- When pavement marking tape is used for marking the railroad crossing, all costs for furnishing and placing the markings, materials, labor, and necessary equipment shall be incidental to the contract unit price per each for "Cold Applied Plastic Pavement Marking, Railroad Crossing".

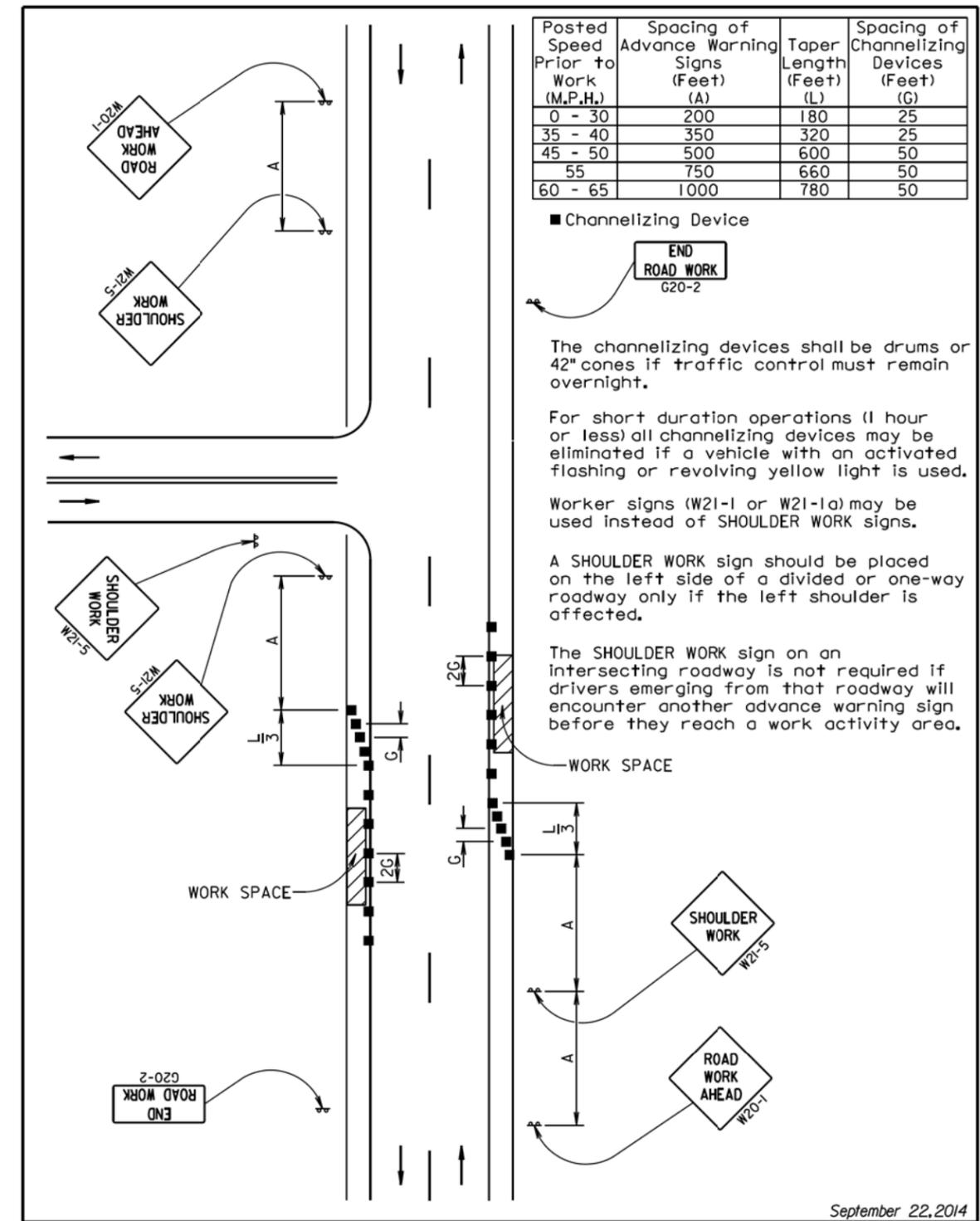
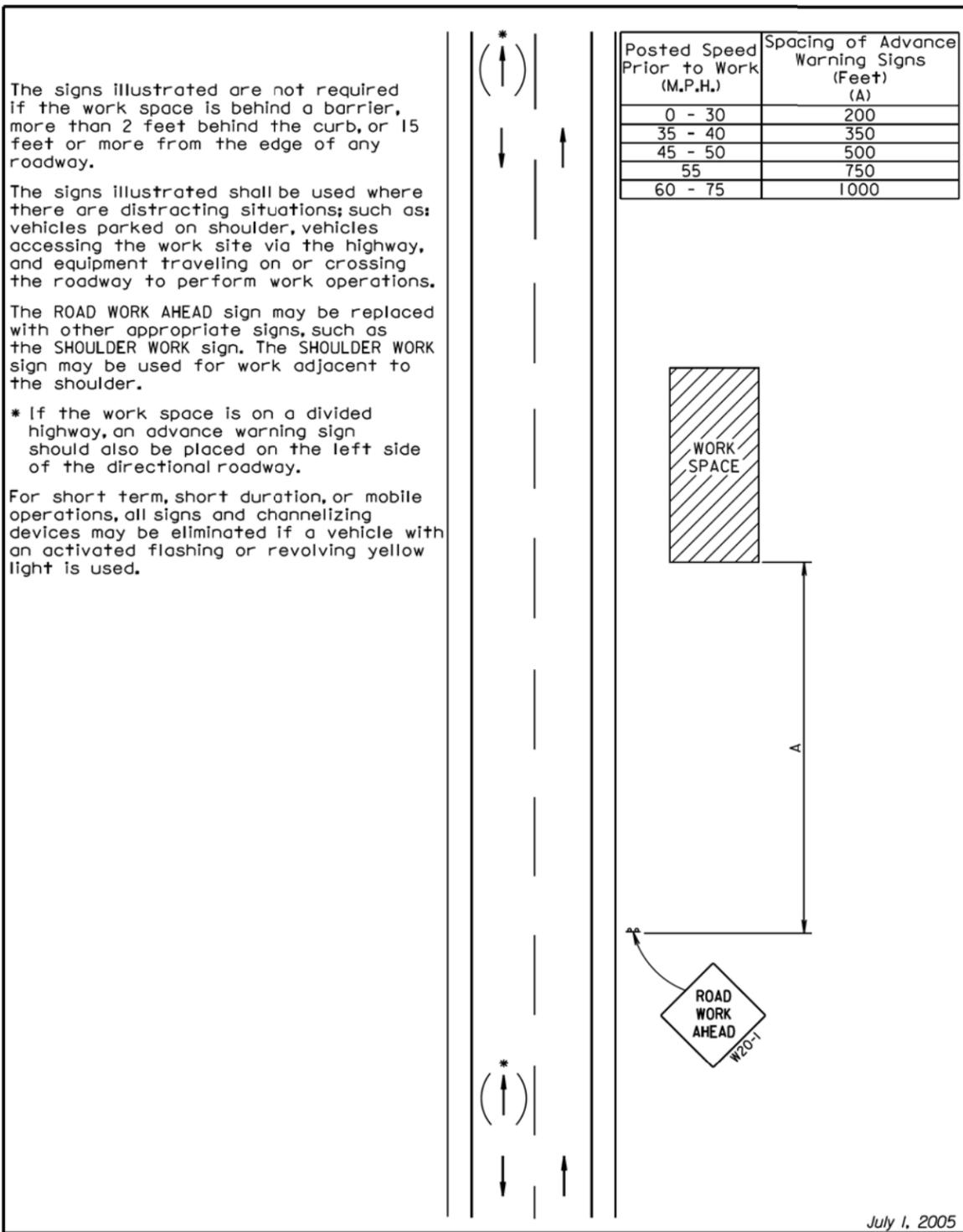
June 26, 2013

<b>S D D O T</b>	<b>PAVEMENT MARKINGS AT RAILROAD CROSSING</b>	PLATE NUMBER <b>633.10</b>
		Sheet 1 of 1

Published Date: 1st Qtr. 2015

PLOTTED FROM - TRWJINT17

PLOT SCALE - 1:206.452

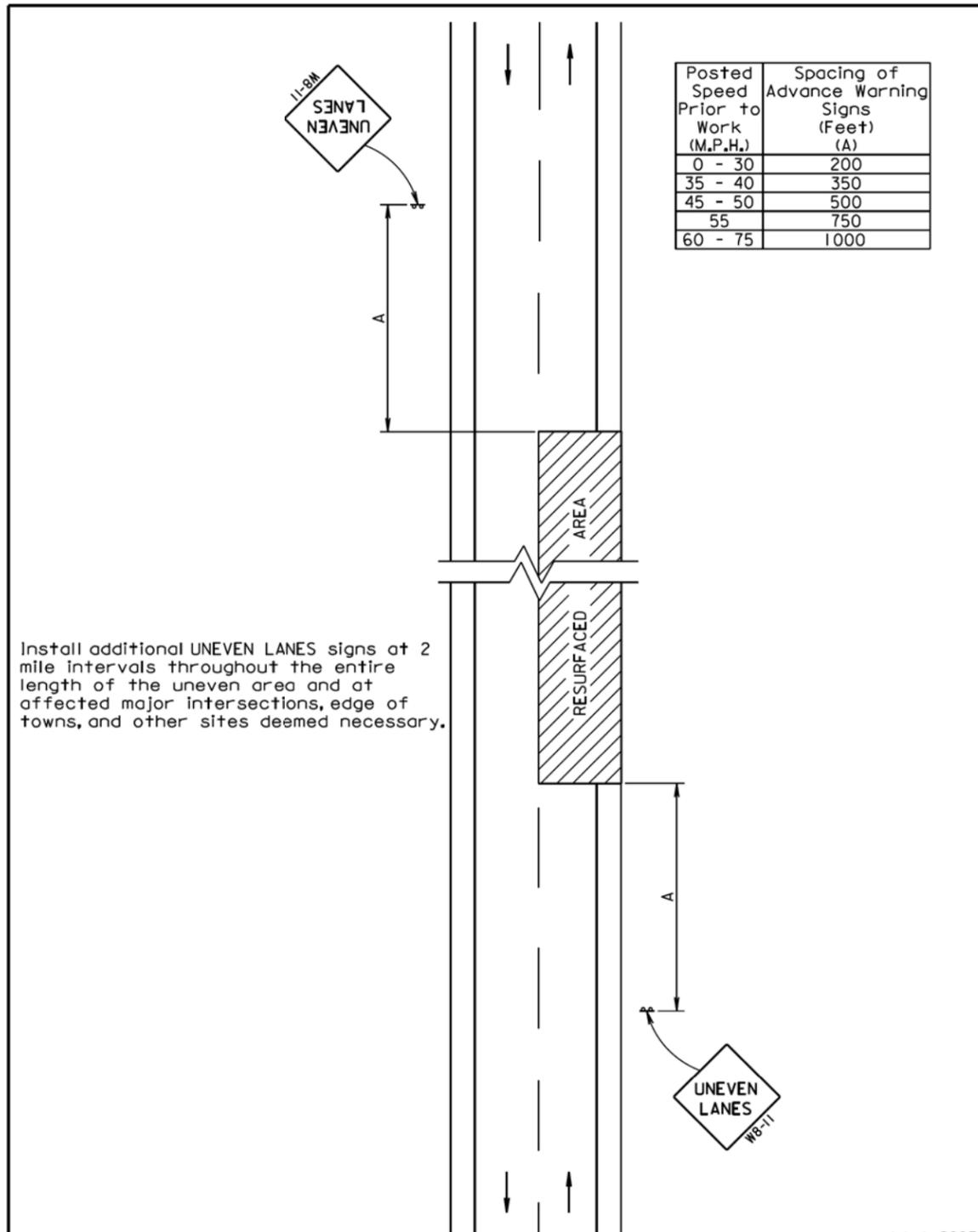


PLOTTED FROM - TRWJINT17

PLOT NAME - 4

FILE - ... \0367 TRAFFIC CONTAINER.DGN

PLOT SCALE - 1:206.452

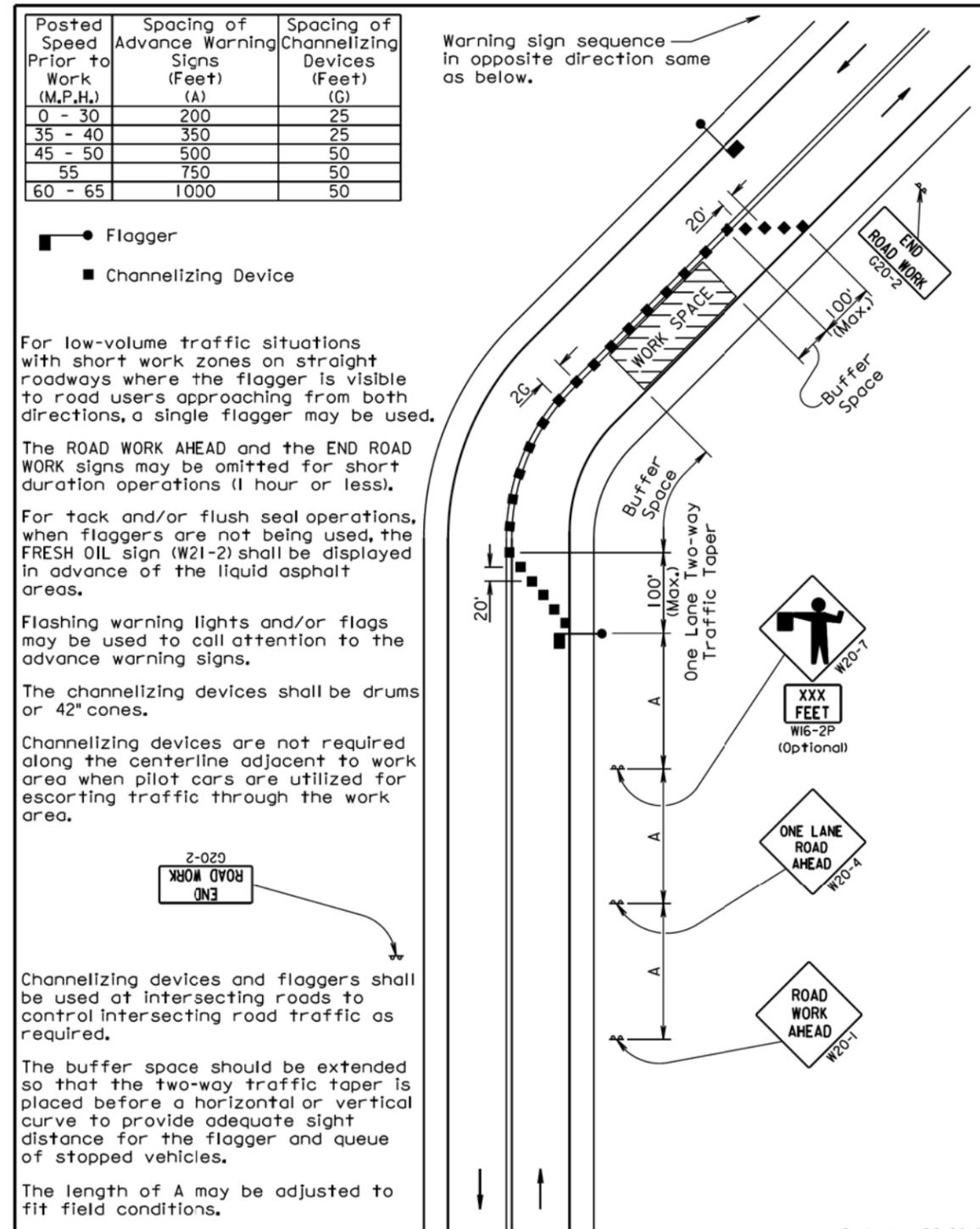


July 1, 2005

PLOTTED FROM - TRWJINT17

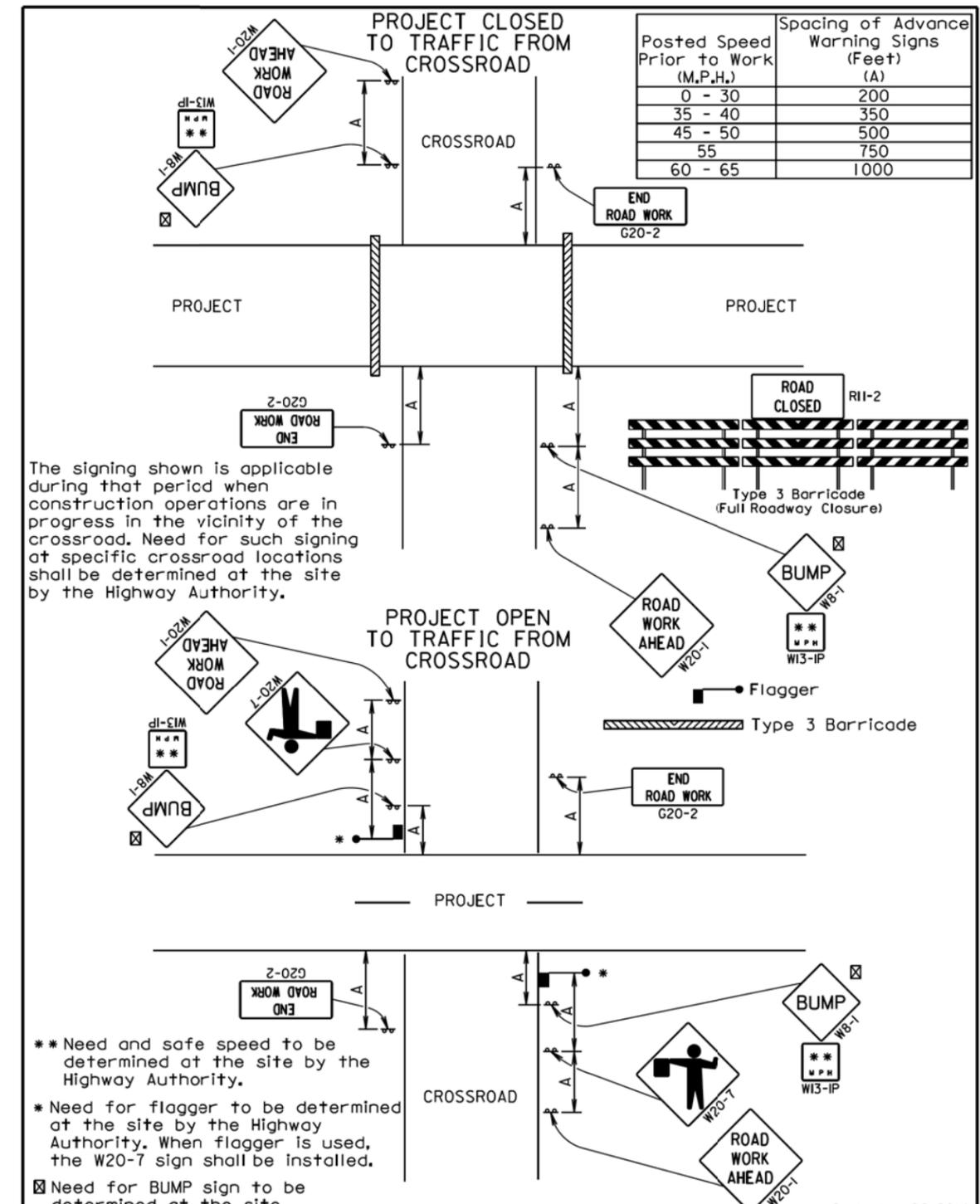
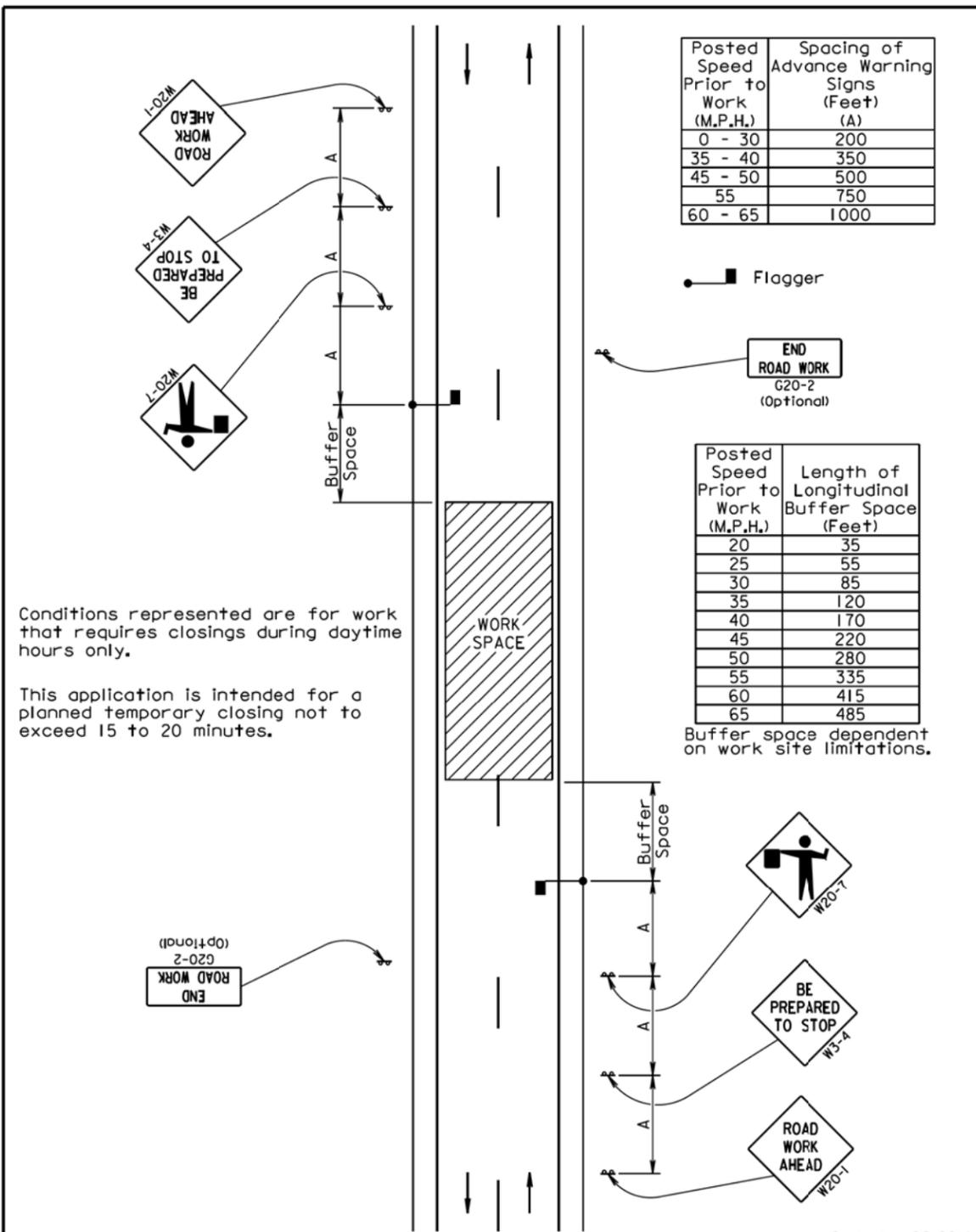
PLOT NAME - 5

FILE - ... \0367 TRAFFIC CONTAINER.DGN



September 22, 2014

PLOT SCALE - 1:206.452



PLOTTED FROM - TRWJINT17

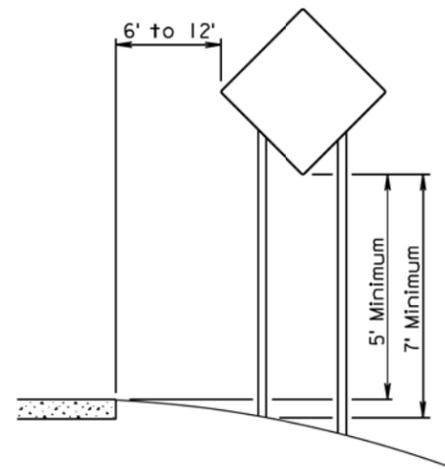
PLOT NAME - 6

FILE - ... \0367 TRAFFIC CONTAINER.DGN

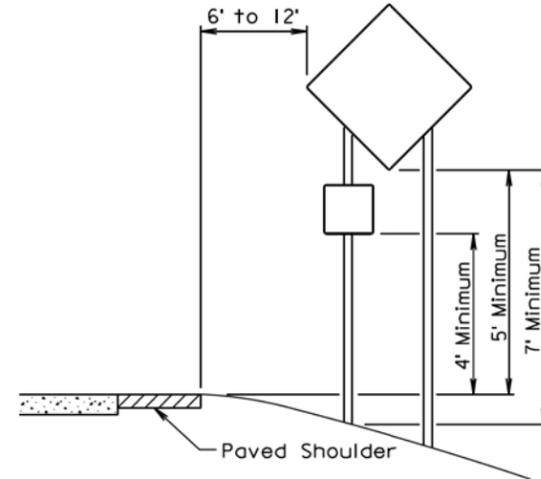
PLOT SCALE - 1:206.452

PLOT NAME - 7

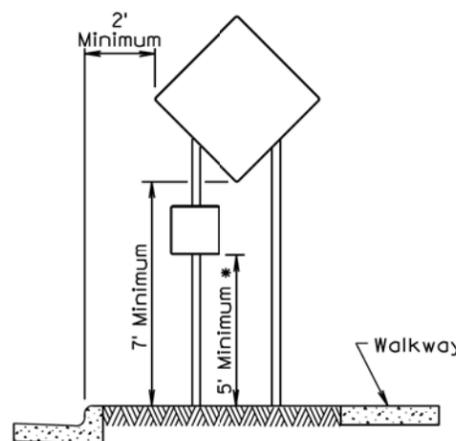
FILE - ... \0367 TRAFFIC CONTAINER.DGN



RURAL DISTRICT

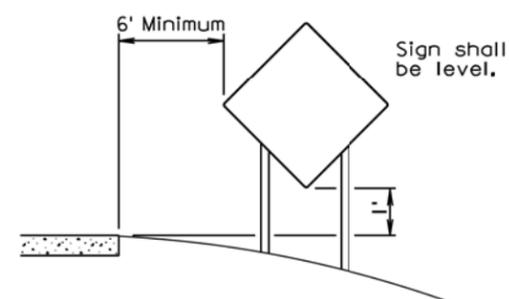


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

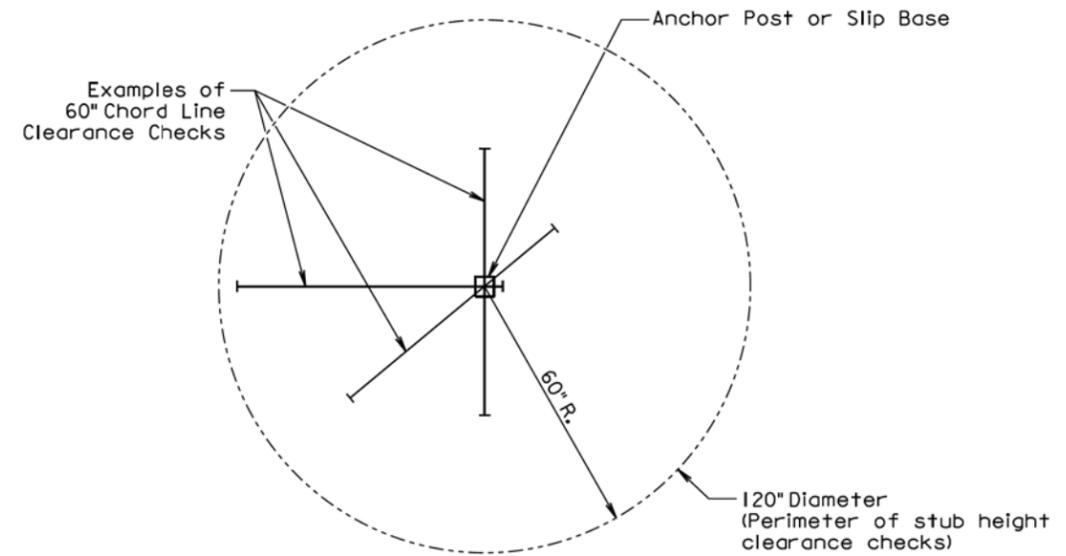
\* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



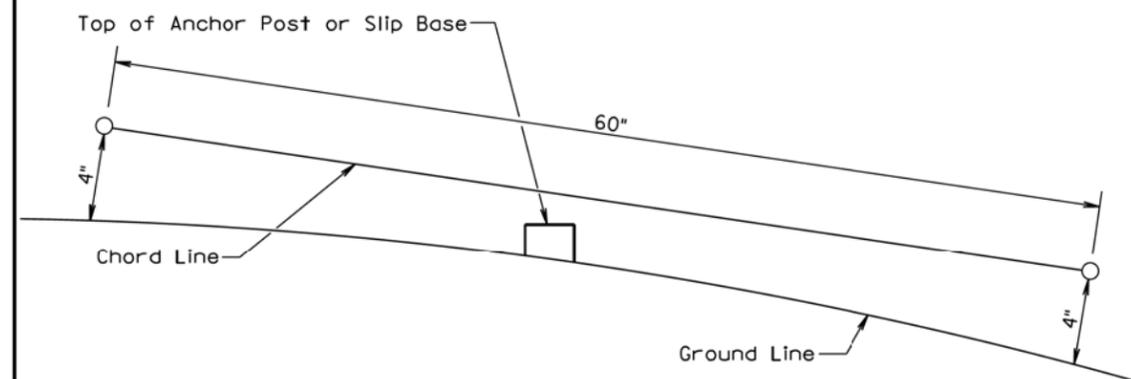
RURAL DISTRICT 3 DAY MAXIMUM  
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 1st 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.

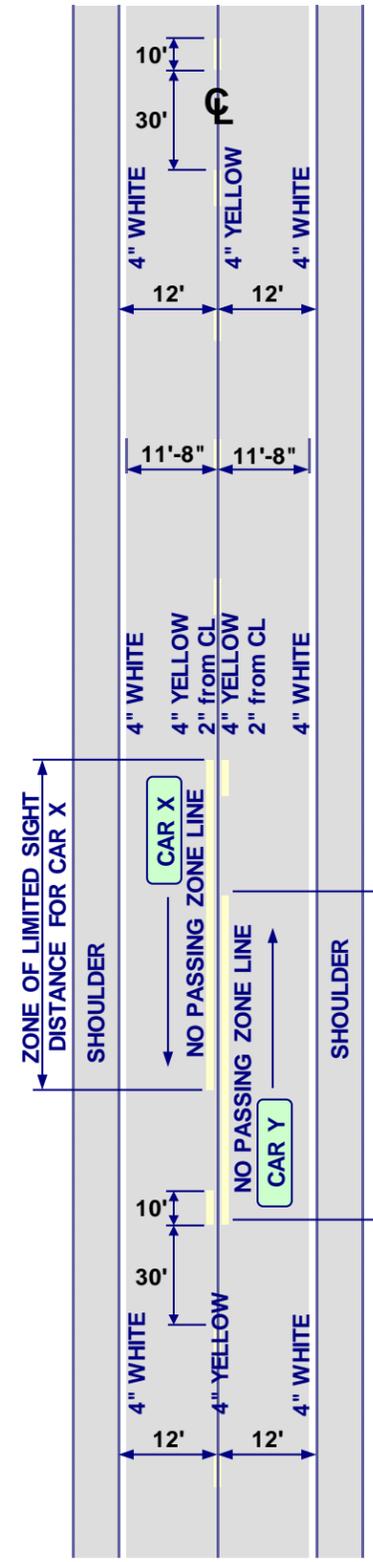
July 1, 2005

Published Date: 1st Qtr. 2015	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

### ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	DESCRIPTION	CONVENTIONAL ROAD			
		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	12	48" x 48"	34	408
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)	12	30" x 30"	21	252
W20-1	ROAD WORK AHEAD	4	48" x 48"	34	136
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)	4	48" x 48"	34	136
W21-1	WORKERS (symbol)		48" x 48"	34	
W21-2	FRESH OIL	2	48" x 48"	34	68
W21-3	ROAD MACHINERY AHEAD		48" x 48"	34	
W21-5	SHOULDER WORK	4	48" x 48"	34	136
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 3 MILES	2	36" x 18"	17	34
G20-1	ROAD WORK NEXT 6 MILES	2	36" x 18"	17	34
G20-1	ROAD WORK NEXT 13 MILES	2	36" x 18"	17	34
G20-2	END ROAD WORK	6	36" x 18"	17	102
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	
<b>TOTAL UNITS</b>		<b>1612</b>			

### TWO LANE ROADWAY



### 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 PAINT QUANTITIES PER PROJECT *			
PAINT	NH 0281(110)105	NH 0281(109)145	TOTALS
	GALLONS	GALLONS	GALLONS
WHITE	408	56	464
YELLOW	122	24	146

\* Includes Additional Quantities of Paint specified below.

ESTIMATED QUANTITIES FOR:		ADDITIONAL QUANTITIES FOR:	
COLD APPLIED PLASTIC		WHITE PAINT	
Description		Description	Gallons
4" Lines	0'	4" Lines	50'
8" Lines	0'	<b>YELLOW PAINT</b>	
12" Gore Lines	0'	Description	Gallons
Crosswalks	0 Ea	Transitions	3 Ea 9
24" Stop Lines	0'	4" Skip Lines	0'
24" Hatches (Yellow)	178'	8" Lines	0'
Solid Areas (Yellow)	250sf	12" Lines	0'
Arrows		24" Hatches	0'
Left Arrows (White)	2 Ea	Solid Areas	0sf 0
Right Arrows	0 Ea	Additional Yellow: 9	
Straight Arrows	0 Ea	Additional Quantities	
Combo Arrows	0 Ea	Rates of Coverage: SqFt/Gal	
Lane Drop Arrows	0 Ea	4", 8" and 12" Lines - 80	
Messages		24" Lines and Bars - 50	
STOP	0 Ea	Arrows, Messages	
STOP AHEAD	0 Ea	and Solid Areas - 30	
R X R with Bars (White)	2 Ea		
SCHOOL X-ING	0 Ea		
Symbols		<b>NOTE:</b> All pavement marking dimensions are based on 12' driving lanes.	
Symbols	0 Ea		
Wheelchair Symbols	0 Ea		

# PAVEMENT MARKING LAYOUT

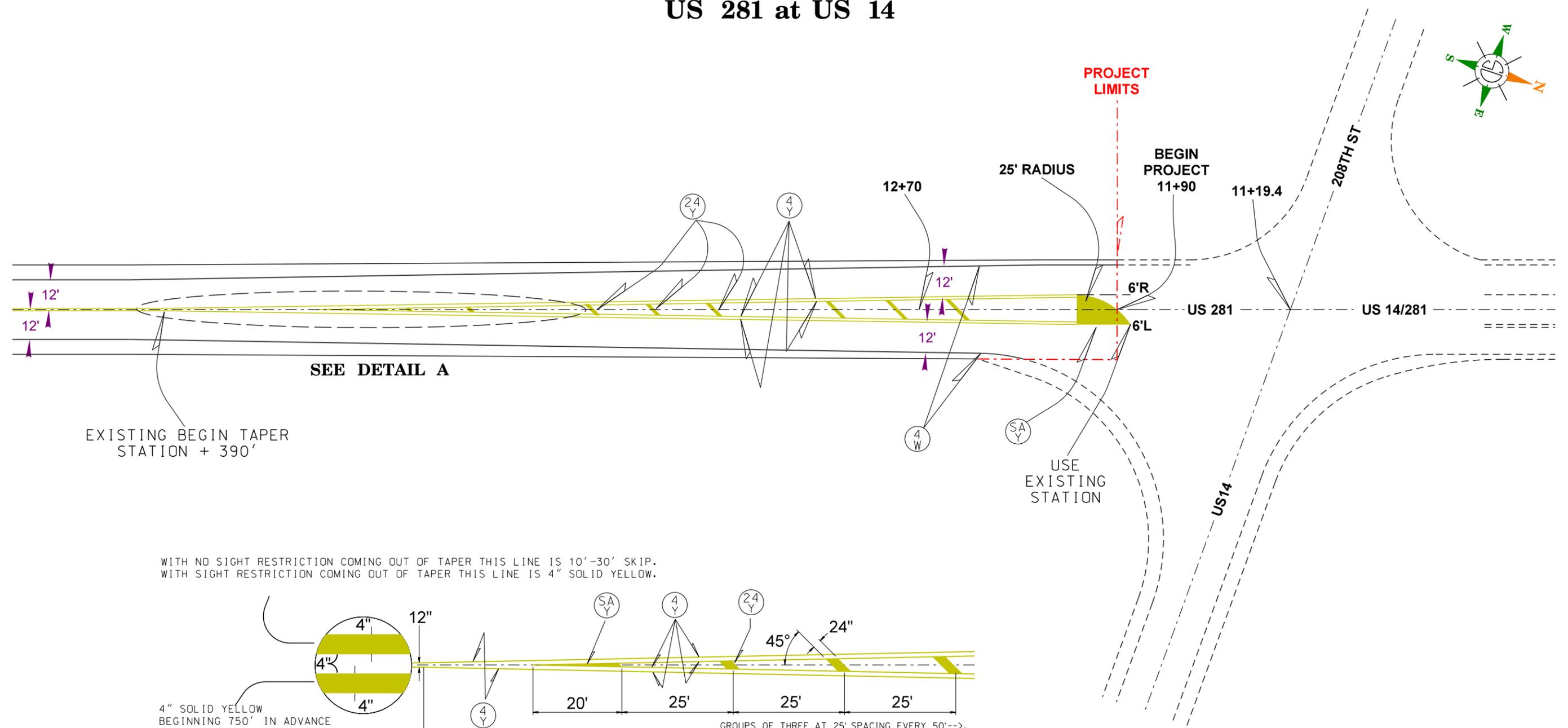
## US 281 at US 14

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	26	75

Plotting Date: 02/06/2015

PLOT SCALE - 1:41.6207

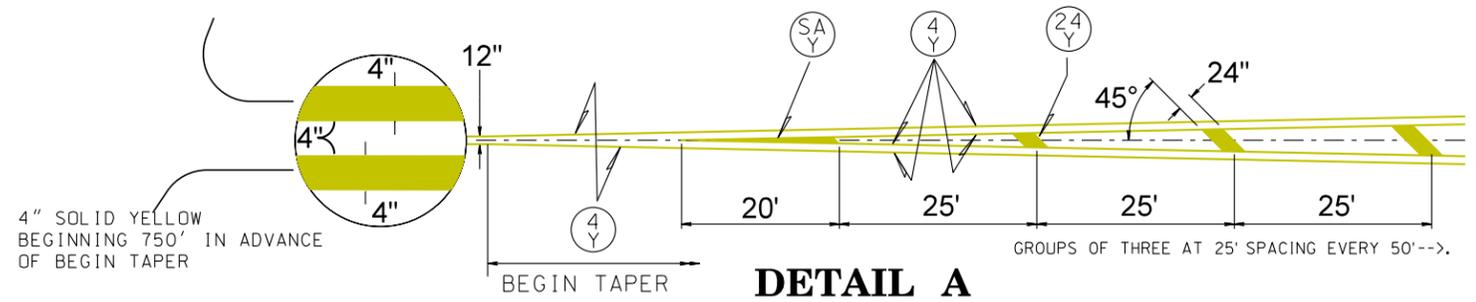
PLOT NAME - 1



SEE DETAIL A

EXISTING BEGIN TAPER STATION + 390'

WITH NO SIGHT RESTRICTION COMING OUT OF TAPER THIS LINE IS 10'-30' SKIP.  
WITH SIGHT RESTRICTION COMING OUT OF TAPER THIS LINE IS 4" SOLID YELLOW.



**KEY:**

- (4W) - PAVEMENT MARKING PAINT, 4" WHITE
- (4Y) - PAVEMENT MARKING PAINT, 4" YELLOW
- (24Y) - PAVEMENT MARKING PLASTIC, 24" YELLOW
- (SA Y) - PAVEMENT MARKING PLASTIC, YELLOW SOLID AREA

PLOTTED FROM - TRM11INT15

FILE - ... \TC\0367 TRAFFIC CONTAINER.DGN

# PAVEMENT MARKING LAYOUT

## US 281 at 180th Street

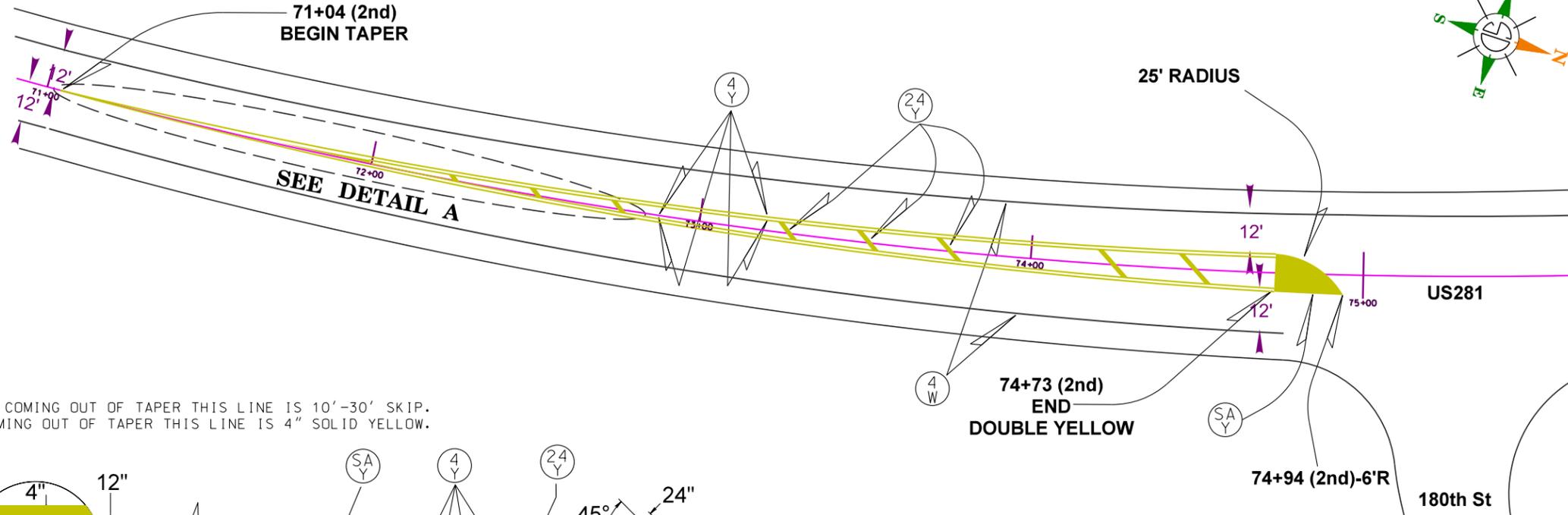
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	27	75

Plotting Date: 02/06/2015

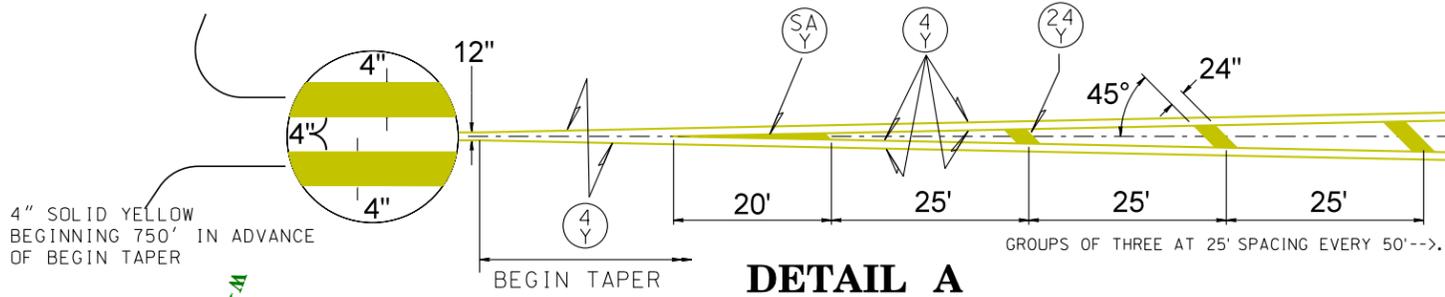
PLOT SCALE - 1:41.6207

PLOT NAME - 1

FILE - ... \TC\0367 TRAFFIC CONTAINER.DGN

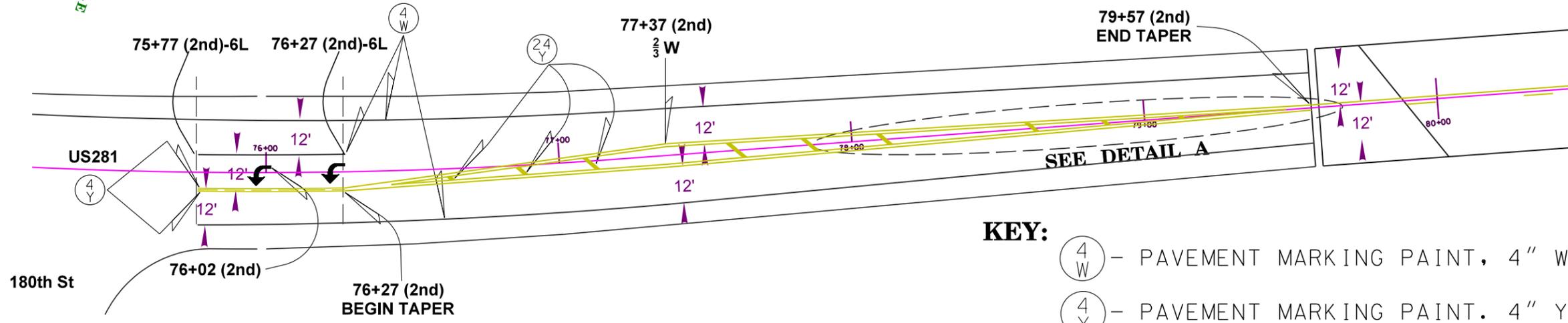


WITH NO SIGHT RESTRICTION COMING OUT OF TAPER THIS LINE IS 10'-30' SKIP.  
WITH SIGHT RESTRICTION COMING OUT OF TAPER THIS LINE IS 4" SOLID YELLOW.



**DETAIL A**

4" SOLID YELLOW BEGINNING 750' IN ADVANCE OF BEGIN TAPER



**KEY:**

- (4W) - PAVEMENT MARKING PAINT, 4" WHITE
- (4Y) - PAVEMENT MARKING PAINT, 4" YELLOW
- (24Y) - PAVEMENT MARKING PLASTIC, 24" YELLOW
- (SA Y) - PAVEMENT MARKING PLASTIC, YELLOW SOLID AREA

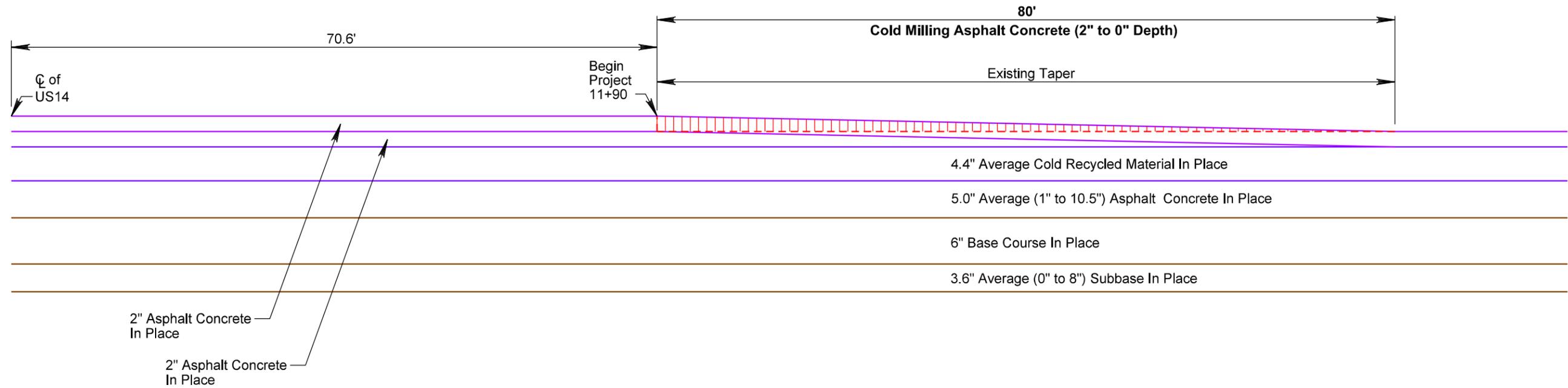
PLOTTED FROM - TRM11115

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	28	75

Plotting Date: 02/06/2015

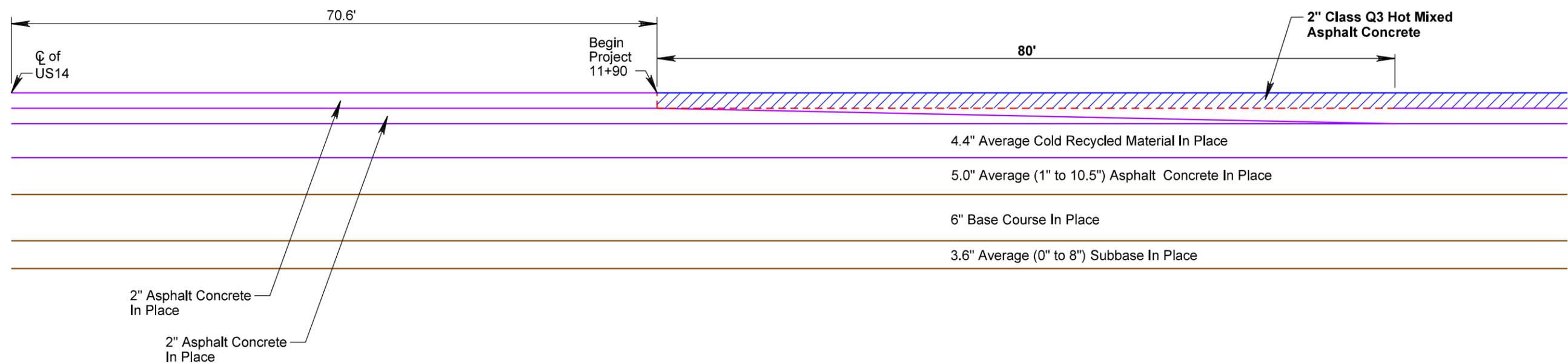
# COLD MILLING TAPER

## AT BEGIN PROJECT - NH 0281(110)105



# RESURFACING TAPER

## AT BEGIN PROJECT - NH 0281(110)105



PLOT SCALE - 1:1.2

PLOTTED FROM - IRWIN115

PLOT NAME - 6

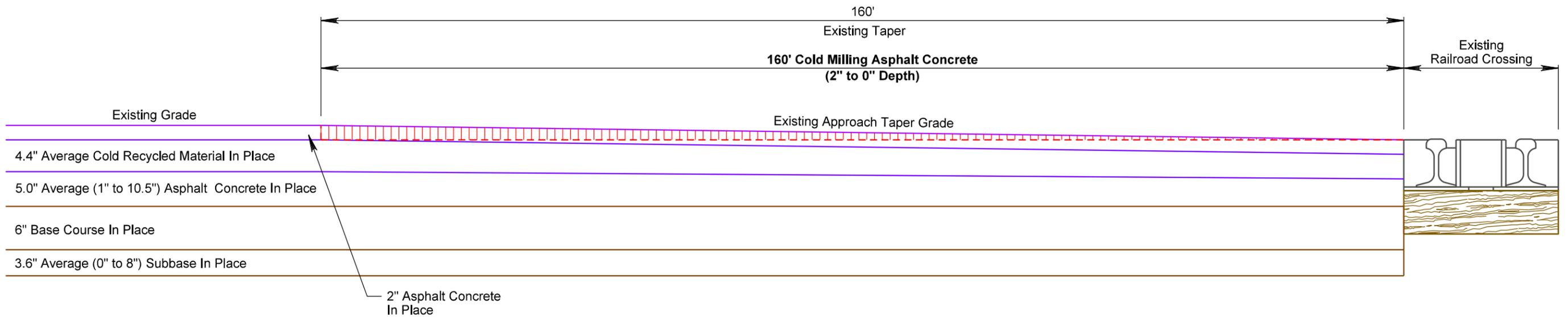
FILE - ... \PRJ2015\BEAD0367\MILL0367.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	29	75

Plotting Date: 02/06/2015

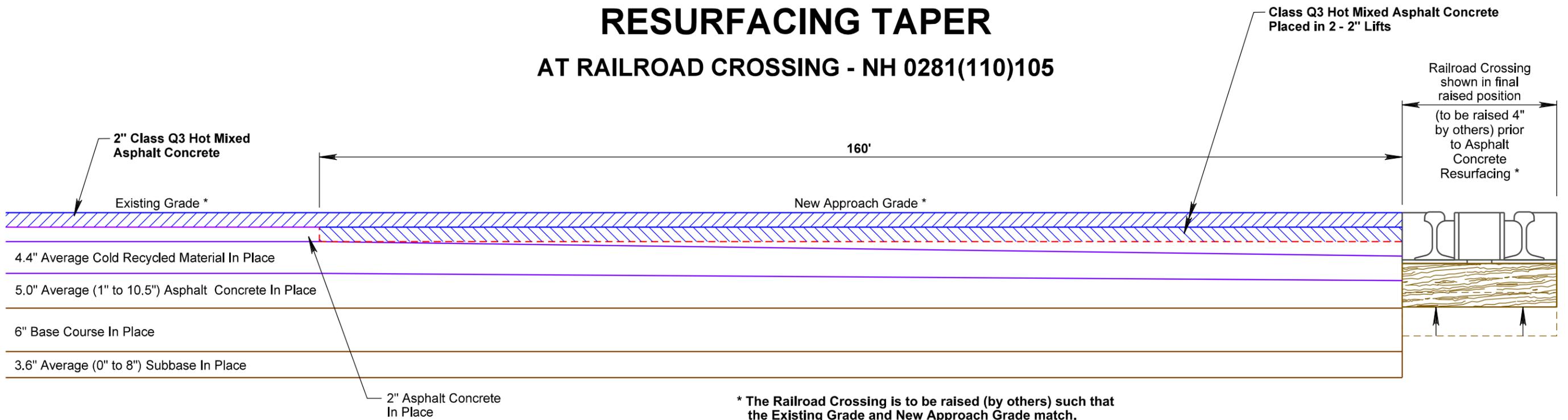
# COLD MILLING TAPER

## AT RAILROAD CROSSING - NH 0281(110)105



# RESURFACING TAPER

## AT RAILROAD CROSSING - NH 0281(110)105



\* The Railroad Crossing is to be raised (by others) such that the Existing Grade and New Approach Grade match.

PLOT SCALE - 1:1.2

PLOTTED FROM - TRM11115

PLOT NAME - 7

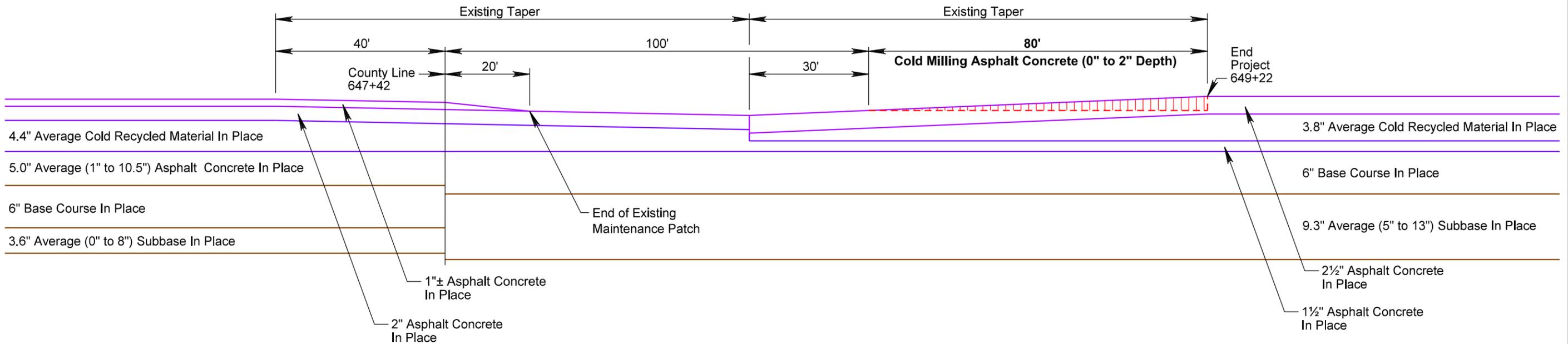
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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	30	75

Plotting Date: 02/06/2015

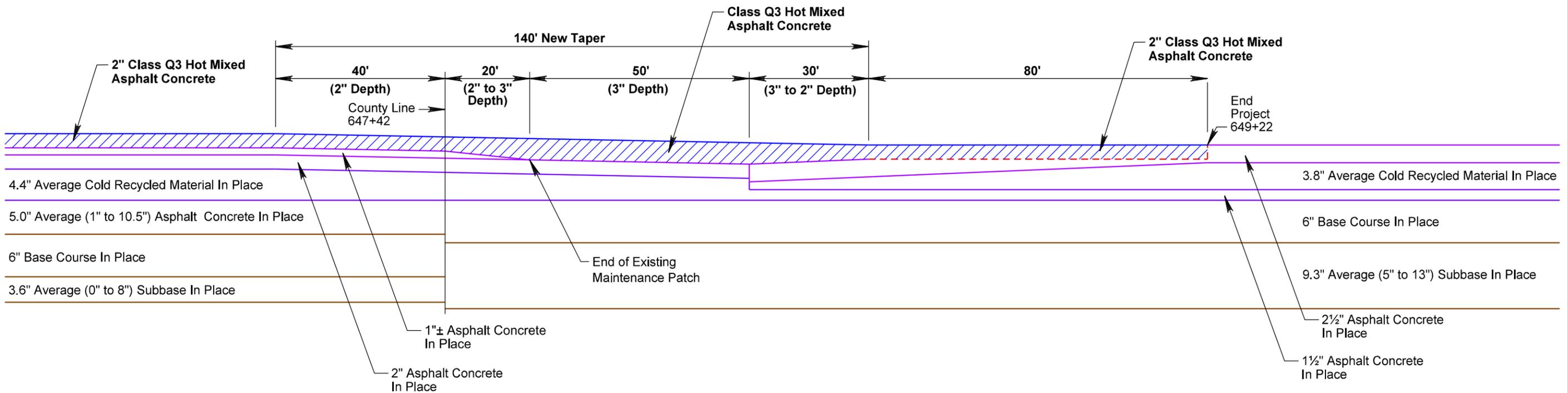
# COLD MILLING TAPER

## AT END PROJECT - NH 0281(110)105



# RESURFACING TAPER

## AT END PROJECT - NH 0281(110)105



PLOT SCALE - 1:1.2

PLOTTED FROM - TRMINT15

PLOT NAME - 8

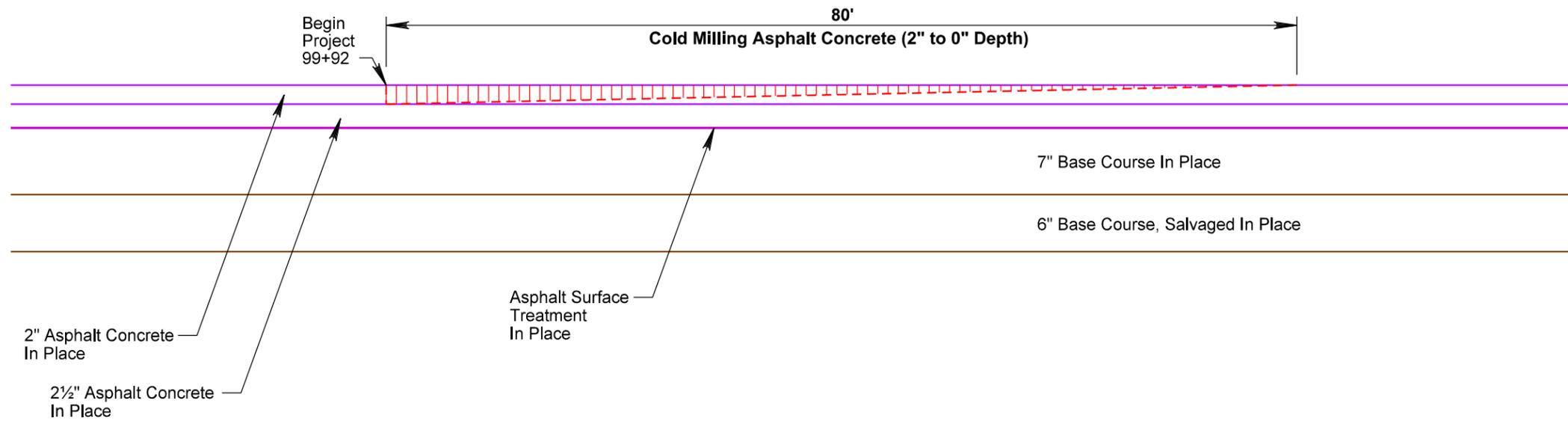
FILE - ... \PRJ2015\BEAD0367\MILL0367.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	31	75

Plotting Date: 02/06/2015

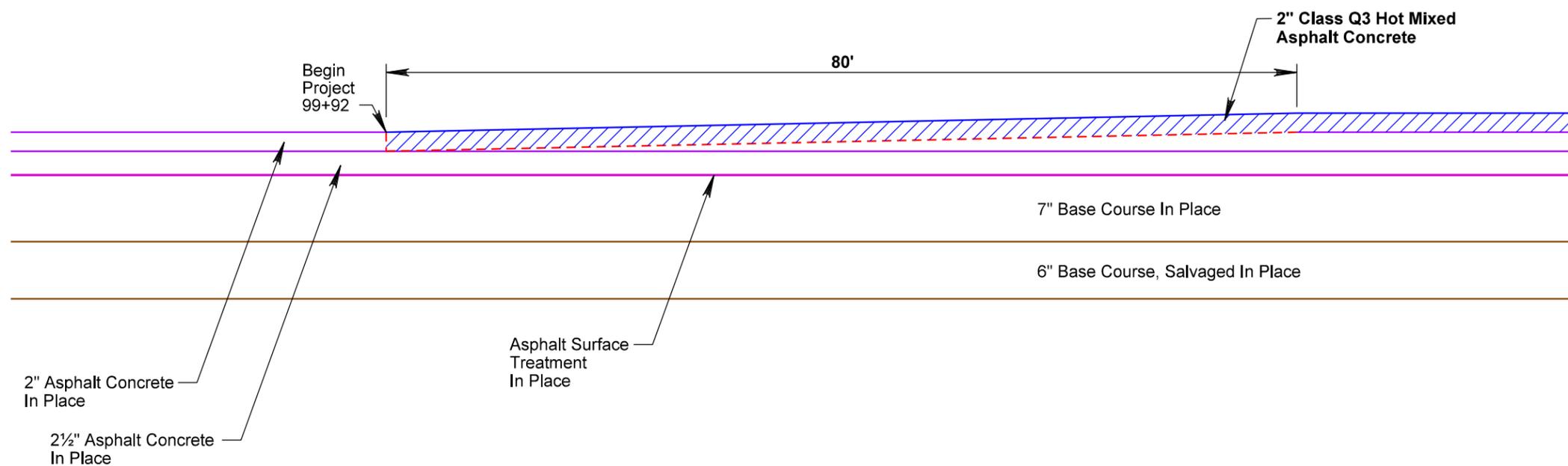
# COLD MILLING TAPER

## AT BEGIN PROJECT - NH 0281(109)145



# RESURFACING TAPER

## AT BEGIN PROJECT - NH 0281(109)145



PLOT SCALE - 1:1.2

PLOT NAME - 9

FILE - ... \PRJ2015\BEAD0367\MILL0367.DGN

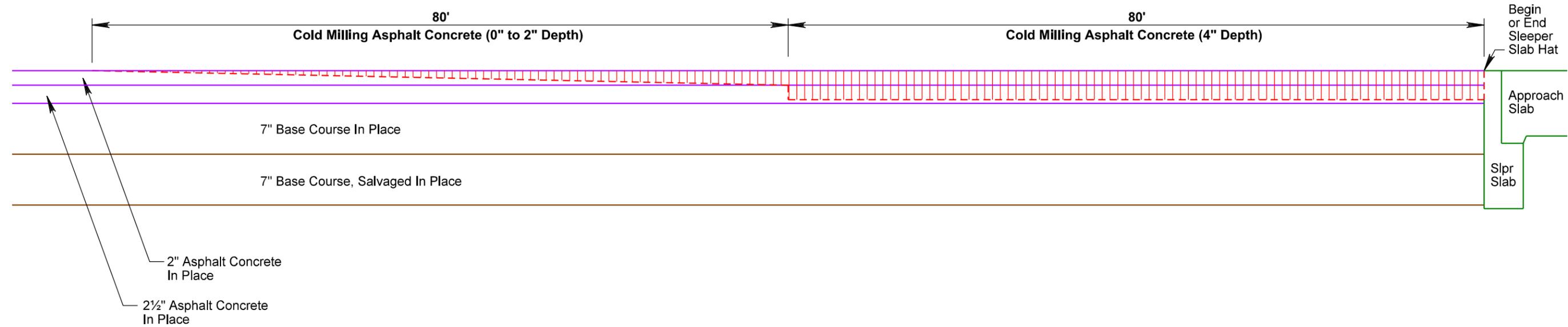
PLOTTED FROM - IRWIN115

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	32	75

Plotting Date: 02/06/2015

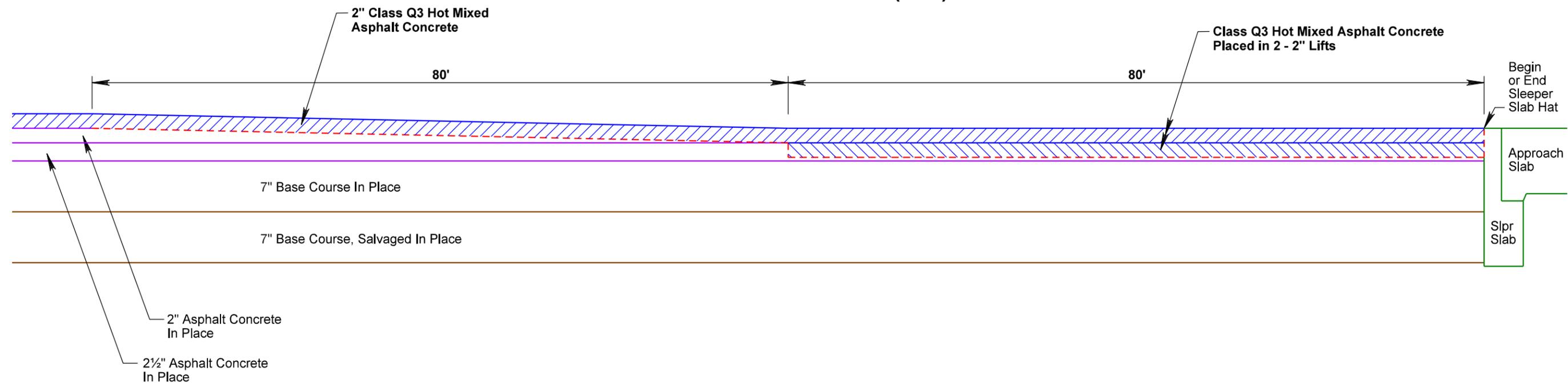
# COLD MILLING TAPER

## AT BRIDGE ENDS - NH 0281(109)145



# RESURFACING TAPER

## AT BRIDGE ENDS - NH 0281(109)145



PLOT SCALE - 1:1.2

PLOTTED FROM - TRMINT15

PLOT NAME - 10

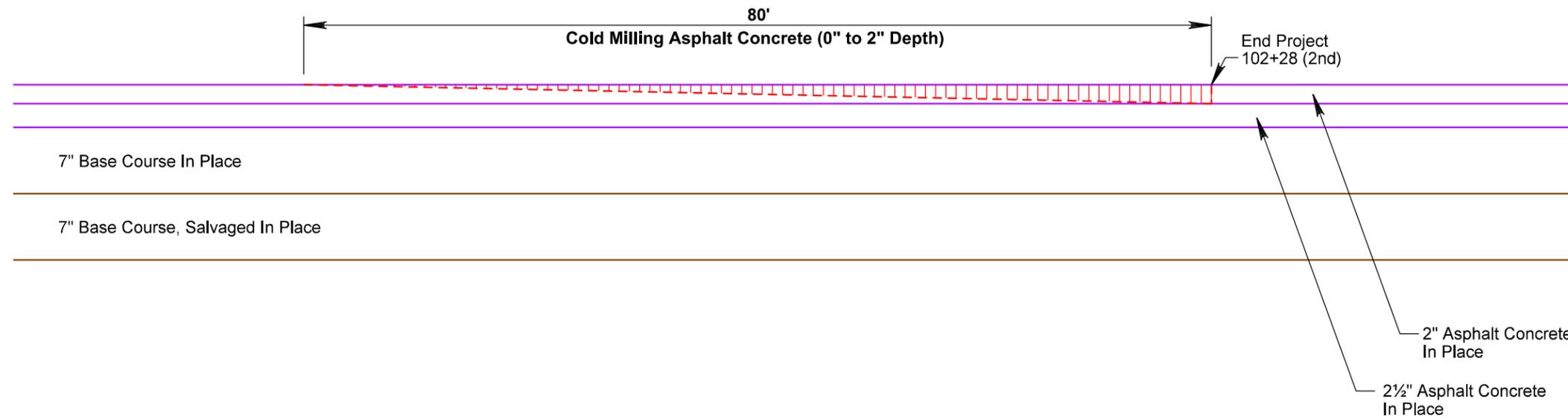
FILE - ... \PRJ2015\BEAD0367\MILL0367.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	33	75

Plotting Date: 02/06/2015

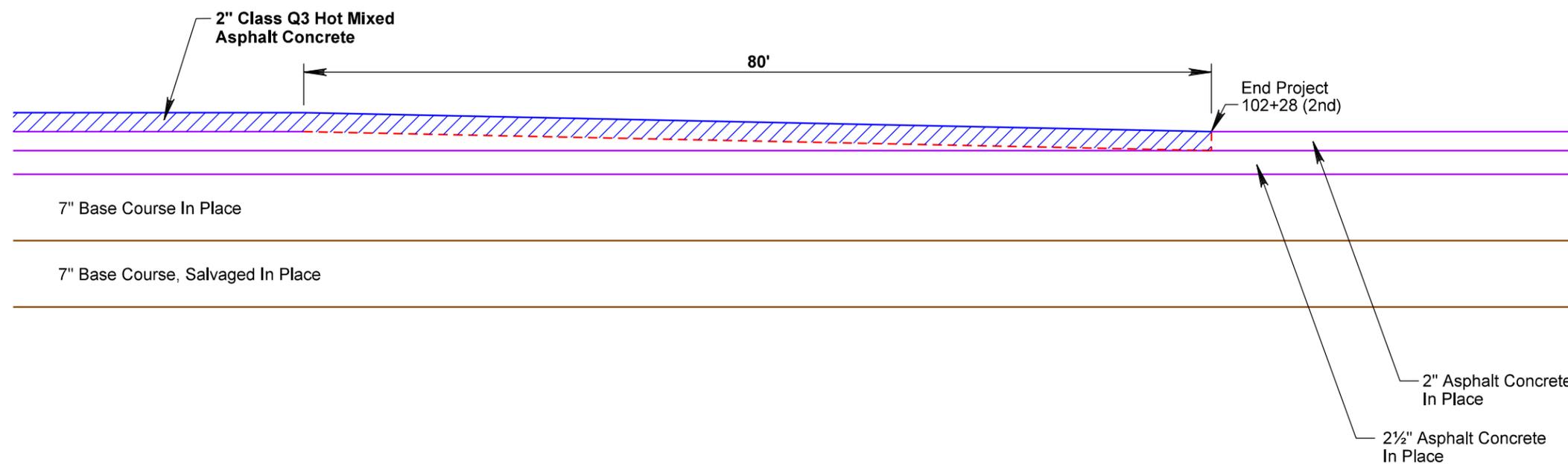
# COLD MILLING TAPER

## AT END PROJECT - NH 0281(109)145



# RESURFACING TAPER

## AT END PROJECT - NH 0281(109)145



PLOT SCALE - 1:1.2

PLOT NAME - 11

FILE - ... \PRJ2015\BEAD0367\MILL0367.DGN

PLOTTED FROM - IRWIN115

# INSTALLATION OF GUARDRAIL

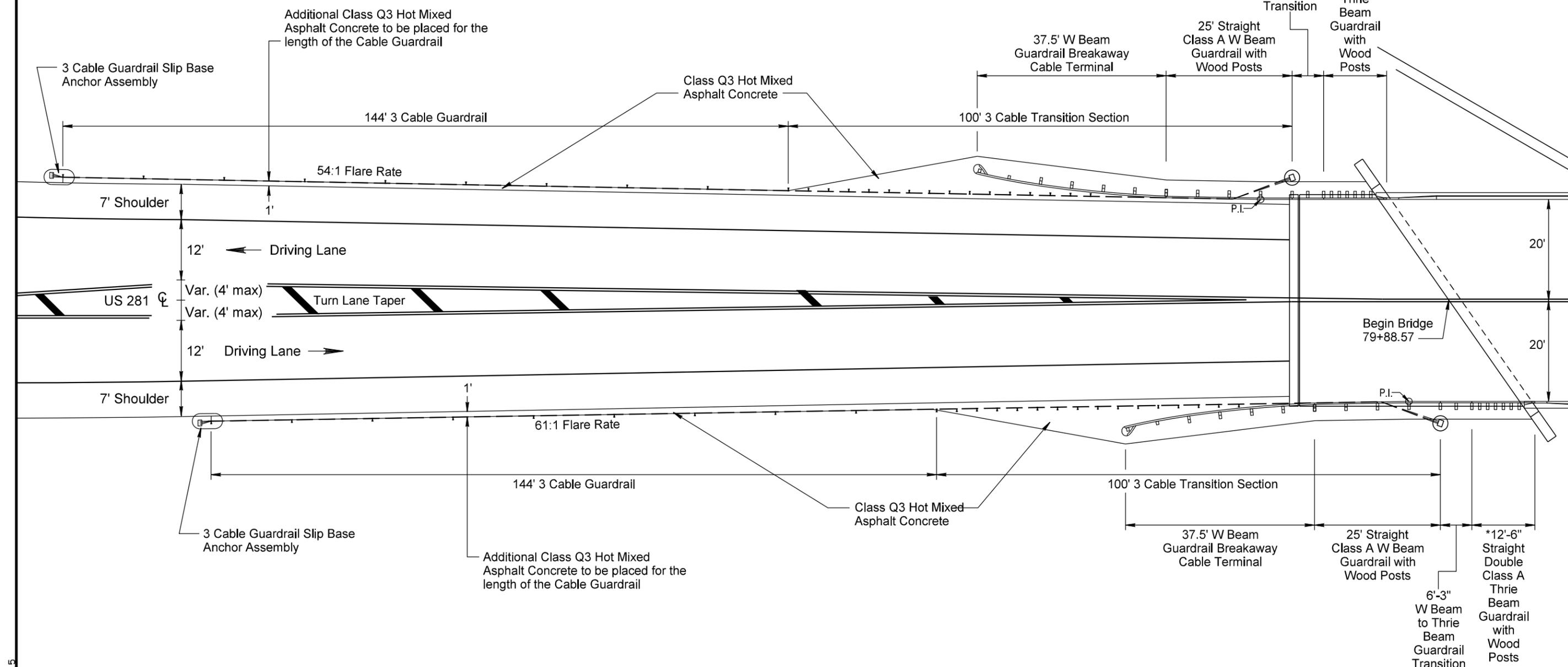
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	34	75

Plotting Date: 02/06/2015

NH 0281(109)145  
STR. NO. 58-101-321  
MRM 146.39  
BEGIN BRIDGE

PLOT SCALE - 1:20

PLOT NAME - 12



PLOTTED FROM - TRM\INT15

FILE - ... \PRJ2015\BEAD0367\T10R04W8.DGN

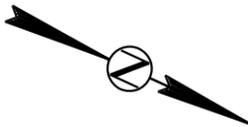
\* 2'-1 1/4" of guardrail overlaps onto structure's endblock.

# INSTALLATION OF GUARDRAIL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	35	75

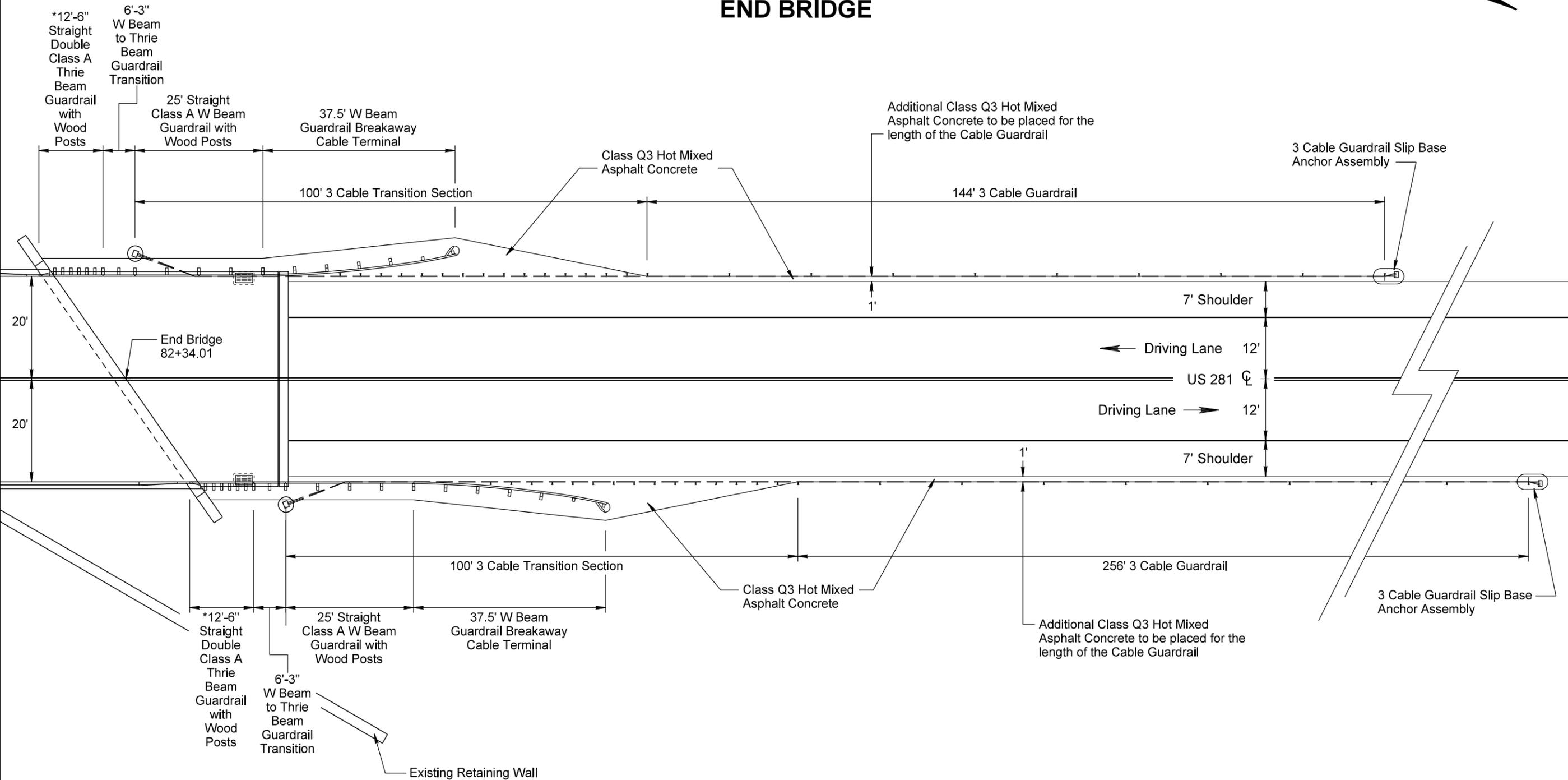
Plotting Date: 02/06/2015

NH 0281(109)145  
STR. NO. 58-101-321  
MRM 146.39  
END BRIDGE



PLOT SCALE - 1:20

PLOT NAME - 13



\* 2'-1 1/4" of guardrail overlaps onto structure's endblock.

PLOTTED FROM - TRM\INT15

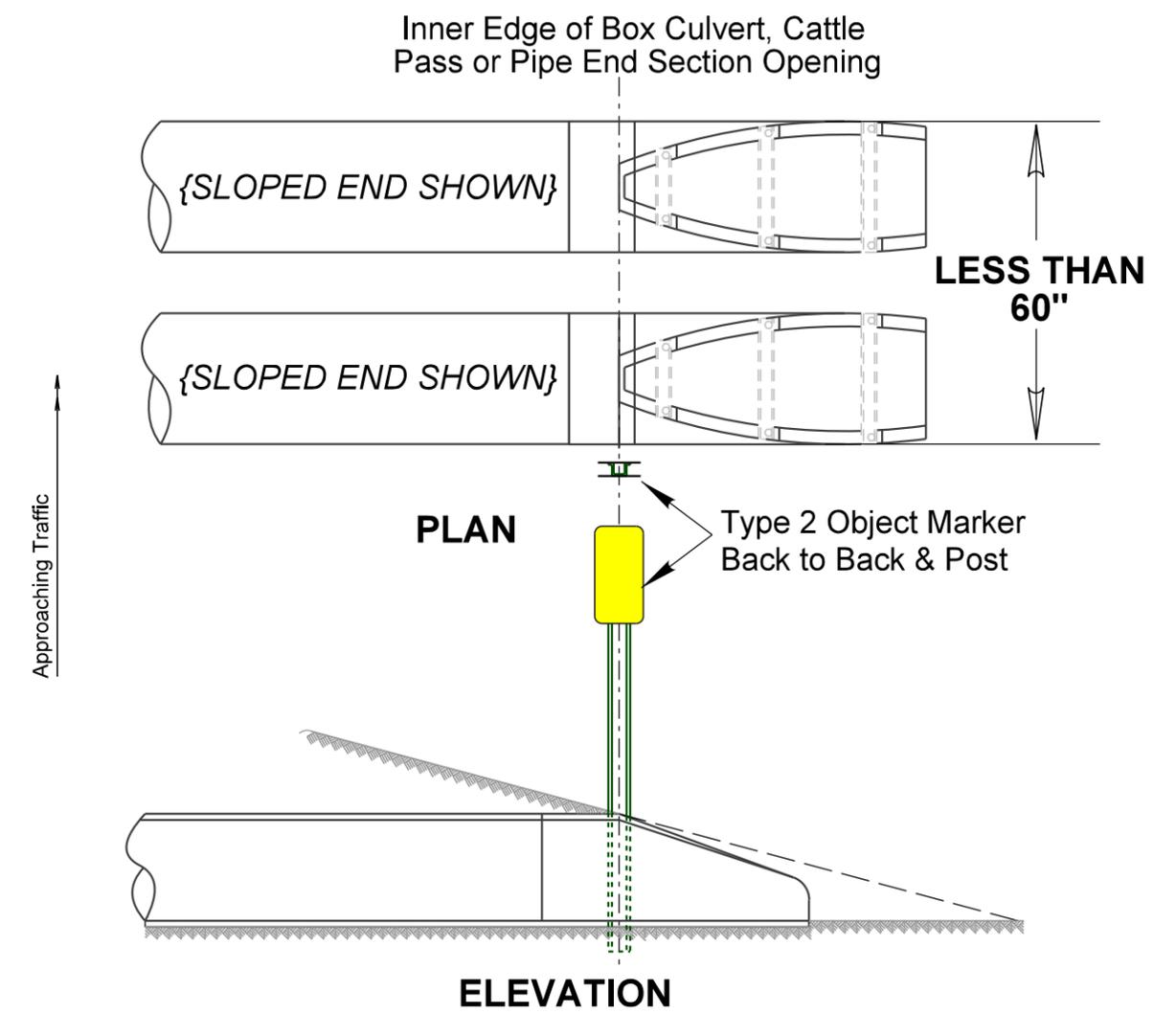
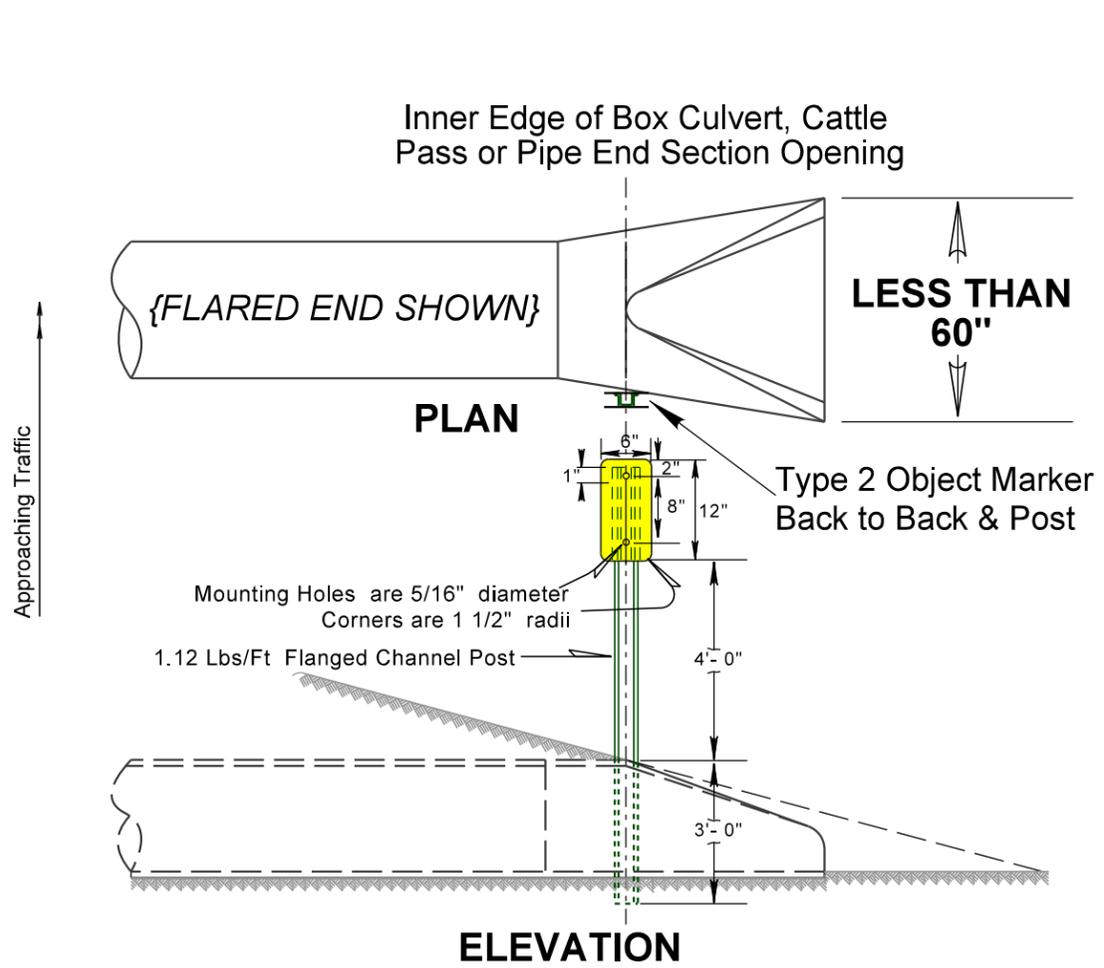
FILE - ... \PRJ2015\BEAD0367\T10R04W8.DGN

# OBJECT MARKER ERECTION DETAILS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	36	75

Plotting Date: 02/06/2015

## TYPICAL AT CULVERT, CATTLE PASS END, OR MULTIPLE PIPES WITH OUTSIDE DIMENSION OR A COMBINED WIDTH OF LESS THAN 60"



PLOT SCALE - 1:6.4

PLOTTED FROM - IRWIN115

PLOT NAME - 14

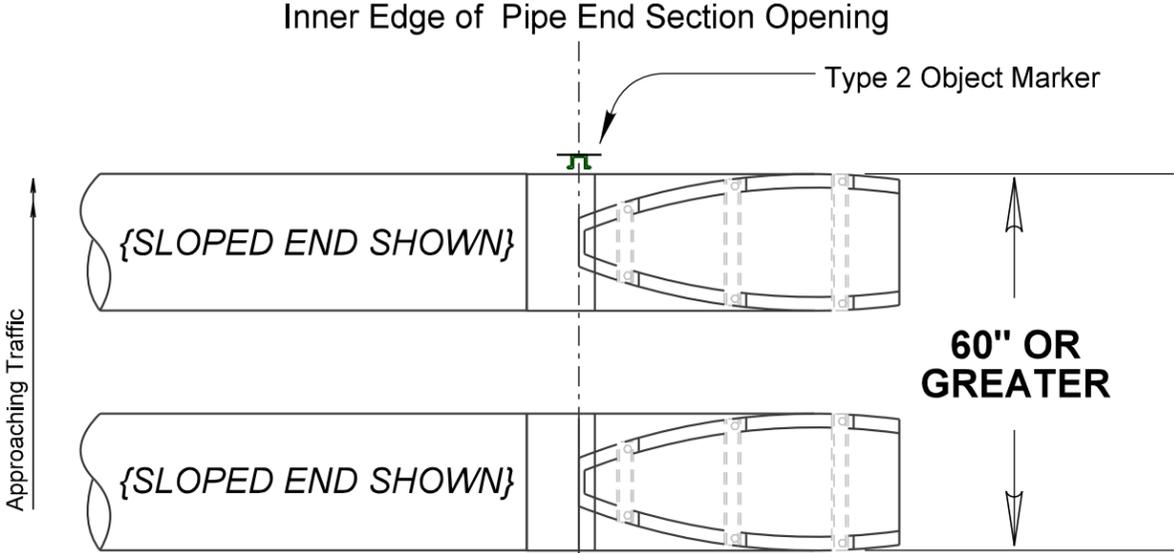
FILE - ... \BEAD0367\OBJECT MARKERS.DGN

# OBJECT MARKER ERECTION DETAILS

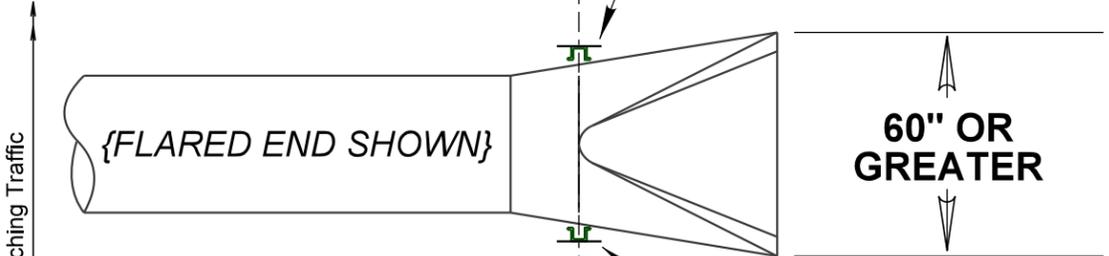
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	37	75

Plotting Date: 02/06/2015

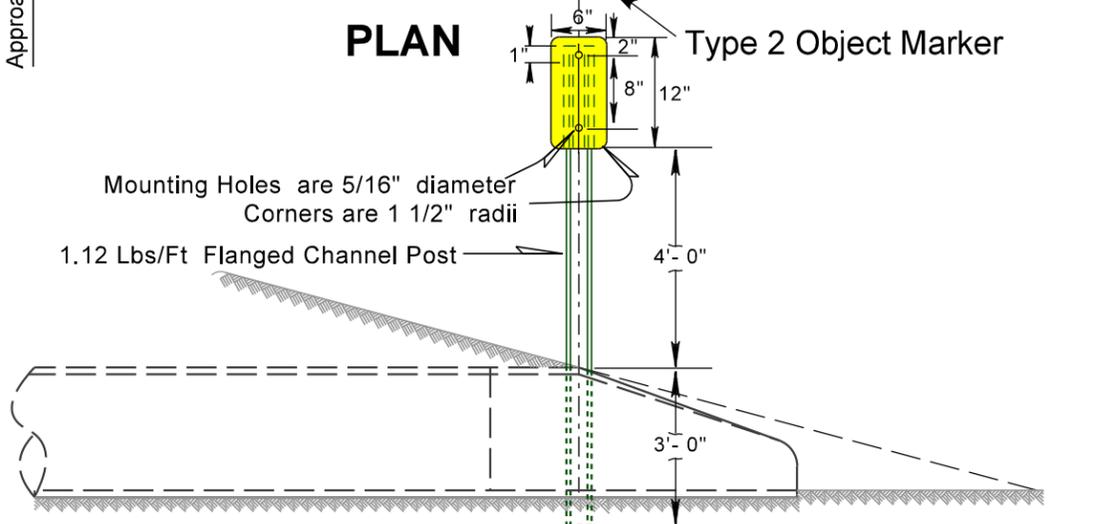
## TYPICAL AT SINGLE OR MULTIPLE PIPES WITH OUTSIDE DIMENSION OR A COMBINED WIDTH OF 60" OR GREATER



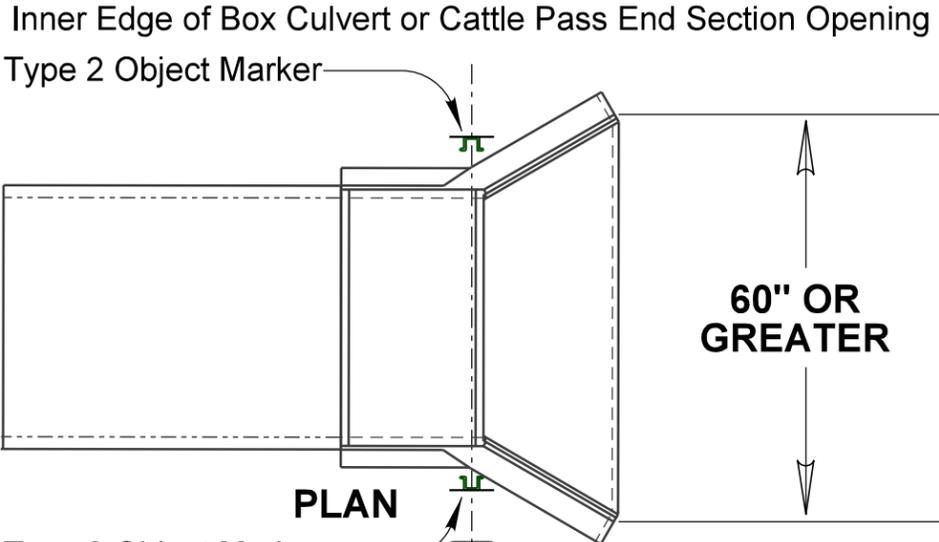
**PLAN**



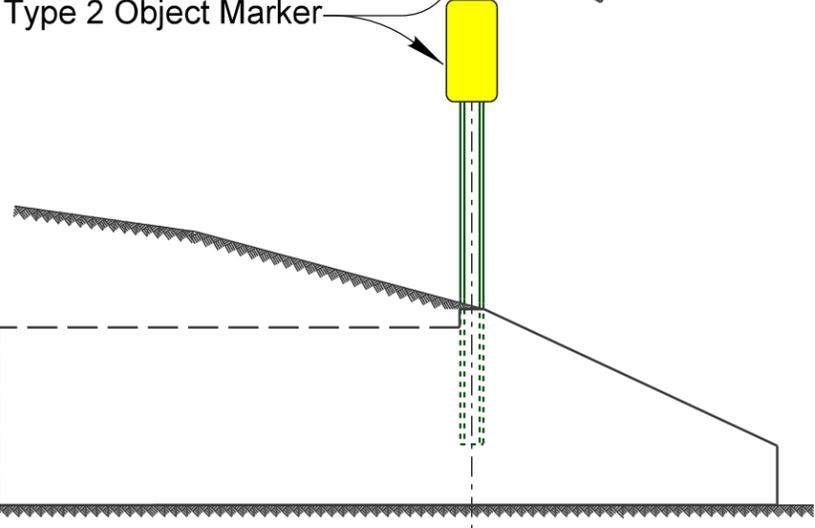
**PLAN**



**ELEVATION**



**PLAN**



**ELEVATION**

PLOT SCALE - 1:6.4

PLOTTED FROM - IRWIN1115

PLOT NAME - 15

FILE - ... \BEAD0367\OBJECT MARKERS.DGN

Plotting Date: 02/06/2015

### US 281, NH 0281(110)105, PCN 0367 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
105.110	Rt.	Beadle County	I-1	36	24	6.0		10		1		1			E	U-Channel	Replace New Sign on New Post
105.130	Lt.	Right Curve Arrow	W1-2R	36	36		9.0	11		1		1			W	4" X 6" Wood	Replace New Sign on New Post
105.151	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			E	4" X 6" Wood	Replace New Sign on New Post
105.504	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
105.584	Lt.	Left Curve Arrow	W1-2L	36	36		9.0	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
106.151	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
106.164	Lt.	Stop	R1-1	30	30		5.2	10		1		1			W	U-Channel	Replace New Sign on New Post
106.174	Rt.	Stop	R1-1	30	30		5.2	10		1		1			E	4" X 6" Wood	Replace New Sign on New Post
106.546	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
106.974	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
107.154	Lt.	Stop	R1-1	30	30		5.2	10		1		1			W	4" X 6" Wood	Replace New Sign on New Post
107.289	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
108.155	Lt.	Stop	R1-1	30	30		5.2	10		1		1			W	4" X 6" Wood	Replace New Sign on New Post
108.163	Rt.	Stop	R1-1	30	30		5.2	10		1		1			E	4" X 6" Wood	Replace New Sign on New Post
108.668	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
109.050	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
109.134	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
109.155	Lt.	Stop	R1-1	30	30		5.2	10		1		1			W	4" X 6" Wood	Replace New Sign on New Post
109.164	Rt.	Stop	R1-1	30	30		5.2	10		1		1			E	4" X 6" Wood	Replace New Sign on New Post

PLOT SCALE - 1:0.08

PLOTTED FROM - TRM\INT15

PLOT NAME - 2

FILE - ... \SIGNING NOTES TABLES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

### US 281, NH 0281(110)105, PCN 0367 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
109.495	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
109.570	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
109.957	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
109.196	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
110.527	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
111.089	Rt.	Virgil 1 --->	D1-1AR	78	24	13.0		24		2		1			S	Telespar	Replace New Sign on New Post
111.155	Lt.	South	M3-3	24	12	2.0		10		1		1			N	4" X 6" Wood	Replace New Sign on New Post
		US 281	M1-4	30	24	5.0					N		Replace New Sign on New Post				
111.173	Lt.	Stop	R1-1	36	36		7.5	11		1		1			W	4" X 6" Wood	Replace New Sign on New Post
111.185	Rt.	Stop	R1-1	36	36		7.5	11		1		1			E	4" X 6" Wood	Replace New Sign on New Post
111.252	Lt.	<--- Virgil 1	D1-1AL	78	24	13.0		24		2		1			N	4" X 6" Wood	Replace New Sign on New Post
111.252	Rt.	North	M3-1	24	12	2.0		10		1		1		S	4" X 6" Wood	Replace New Sign on New Post	
		US 281	M1-4	30	24	5.0					S		Replace New Sign on New Post				
111.732	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
112.065	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
112.180	Lt.	Stop	R1-1	30	30		5.2	10		1		1			W	4" X 6" Wood	Replace New Sign on New Post
112.187	Rt.	Stop	R1-1	30	30		5.2	10		1		1			E	4" X 6" Wood	Replace New Sign on New Post
113.179	Lt.	Stop	R1-1	30	30		5.2	10		1		1			W	4" X 6" Wood	Replace New Sign on New Post
113.186	Rt.	Stop	R1-1	30	30		5.2	10		1		1			E	4" X 6" Wood	Replace New Sign on New Post
113.675	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
114.065	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
114.189	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
114.557	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			N	4" X 6" Wood	Replace New Sign on New Post
115.214	Lt.	Stop	R1-1	30	30		5.2	10		1		1			W	4" X 6" Wood	Replace New Sign on New Post
115.222	Rt.	Stop	R1-1	30	30		5.2	10		1		1			E	4" X 6" Wood	Replace New Sign on New Post

PLOT SCALE - 1:0.08

PLOTTED FROM - TRM1115

PLOT NAME - 1

FILE - ... \SIGNING NOTES TABLES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

### US 281, NH 0281(110)105, PCN 0367 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
116.213	Lt.	Stop	R1-1	36	36		7.5	11		1		1			W	4" X 6" Wood	Replace New Sign on New Post
116.222	Rt.	Stop	R1-1	36	36		7.5	11		1		1			E	4" X 6" Wood	Replace New Sign on New Post
116.661	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
116.872	Rt.	Railroad Advanced Warning	W10-1	36	36		7.1	11		1		1			S	4" X 6" Wood	Replace New Sign on New Post
116.975	Lt.	Jct 34 21 / Plankinton 47	D2-2	108	42	31.5			28		2	1			N	4" X 6" Wood	Replace New Sign on New Post
116.995	Rt.	Junction Marker	M2-1	21	15	2.2		11		1		1			SE	4" X 6" Wood	Replace New Sign on New Post
		US 14	M1-4	24	24	4.0							SE	Replace New Sign on New Post			
117.000	Rt.	Adopt-A-Highway													SE	4" X 6" Wood	Reset Existing Sign on New Post
		Nustar Energy Employees						12		1		1	1	SE	Reset Existing Sign on New Post		
		Adopt-A-Highway												SE	Reset Existing Sign on New Post		
117.057	Rt.	Miller / Redfield / Huron	D1-3	90	54	33.8			30		2	1			SE	4" X 6" Wood	Replace New Sign on New Post
117.097	Lt.	Railroad Advanced Warning	W10-1	36	36		7.1	11		1		1			NW	4" X 6" Wood	Replace New Sign on New Post
117.132	Lt.	South	M3-3	24	12	2.0		11		1		1			SE	4" X 6" Wood	Replace New Sign on New Post
		US 281	M1-4	30	24	5.0							SE	Replace New Sign on New Post			
117.134	Rt.	North	M3-1	24	12	2.0		24		2		1			NW	4" X 6" Wood	Replace New Sign on New Post
		US 281	M1-4	30	24	5.0							NW	Replace New Sign on New Post			
		Vertical Single Arrow	M6-3	21	15	2.2							NW	Replace New Sign on New Post			
		East	M3-2	24	12	2.0							NW	Replace New Sign on New Post			
		US 14	M1-4	24	24	4.0							NW	Replace New Sign on New Post			
		Double Arrow Vertical Right	M6-6	21	15	2.2							NW	Replace New Sign on New Post			
				TOTAL		141.8	247.4	573.0	70.0	53.0	5.0	52.0	1.0	1.0			

PLOT SCALE - 1:0.08

PLOTTED FROM - TRMINT15

PLOT NAME - 3

FILE - ...SIGNING NOTES TABLES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

## PCN 0367 Sign Summary US 281

Sign Code	Description	Width (Inches)	Height (Inches)	Sq. Ft.	Quantity	Flat Aluminum Sign, Nonremovable Copy High Intensity (SQFT)	Flat Aluminum Sign, Nonremovable Copy Super or Very High Intensity (SQFT)	Text / Background
D1-1	Virgil 1 --->/<---	78	24	13.0	2	26.0		White on Green
D1-3	Miller / Redfield / Huron	90	54	33.8	1	33.8		White on Green
D2-2	Jct 34 21 / Plankinton 47	108	42	31.5	1	31.5		White on Green
I-1	Beadle County	36	24	6.0	1	6.0		White on Green
M1-4	US 14	24	24	4.0	2	8.0		Black on White
M1-4	US 281	30	24	5.0	4	20.0		Black on White
M2-1	Junction Marker	21	15	2.2	1	2.2		Black on White
M3-1	North	24	12	2.0	2	4.0		Black on White
M3-2	East	24	12	2.0	1	2.0		Black on White
M3-3	South	24	12	2.0	2	4.0		Black on White
M6-3	Vertical Single Arrow	21	15	2.2	1	2.2		Black on White
M6-6	Double Arrow Vertical Right	21	15	2.2	1	2.2		Black on White
R1-1	Stop	30	30	5.2	13		67.6	White on Red
R1-1	Stop	36	36	7.5	4		30.0	White on Red
W10-1	Railroad Advanced Warning	36	36	7.1	2		14.2	Black on Fluorescent Yellow
W1-2L	Left Curve Arrow	36	36	9.0	1		9.0	Black on Fluorescent Yellow
W1-2R	Right Curve Arrow	36	36	9.0	1		9.0	Black on Fluorescent Yellow
W14-3	No Passing Zone	48X48X36		5.6	21		117.6	Black on Fluorescent Yellow
					<b>Totals</b>		<b>141.8</b>	<b>247.4</b>

PLOT SCALE - 1:0.08

PLOTTED FROM - TRM\INT15

PLOT NAME - 4

FILE - ... \SIGNING NOTES TABLES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

### US 281, NH 0281(109)145, PCN 04W8 Permanent Sign Installation Table

MRM	Side of Road	Description	Sign Code	Width (Inches)	Height (Inches)	Flat Aluminum Sign, Nonremovable Copy High Intensity (SqFt)	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SqFt)	2.0"x2.0" Perforated Tube Post 12 Ga. (Ft)	2.5"x2.5" Perforated Tube Post 10 Ga. (Ft)	(N.A.B.I.) Square Tube Anchor Sleeve (Each)	(N.A.B.I.) 48" Winged Slip Base Anchor (Each)	Remove Traffic Sign (Each)	Direction Sign Faces	Current Type of Post	Remarks
145.330	Lt.	Adopt A Highway	ADO-5	36	36	9.0		11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
		Tulare Jaycees Club	ADO-1	36	12	3.0					N		Replace New Sign on New Post		
		Litter Crew Ahead	ADO-6	30	30	6.3					N		Replace New Sign on New Post		
145.446	Lt.	Stop	R1-1	30	30		5.2	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
145.454	Rt.	Stop	R1-1	30	30		5.2	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
145.972	Rt.	Left Reverse Curve Arrow	W1-4L	36	36		9.0	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
146.035	Lt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	S	4" X 6" Wood	Replace New Sign on New Post
146.202	Rt.	Bridge Ices Before Road	W8-13	36	36		9.0					1	S	Telespar	Replace New Sign on Existing Post
146.258	Lt.	Horizontal Double Arrow	W1-7										E	Telespar	Do Not Disturb
146.265	Rt.	Stop	R1-1	30	30		5.2	10		1		1	E	4" X 6" Wood	Replace New Sign on New Post
146.298	Rt.	Twin Lakes Public Water Access		114	48	38.0			30		2	1	S	4" X 6" Wood	Replace New Sign on New Post
146.480	Lt.	Stop	R1-1	30	30		5.2	10		1		1	W	4" X 6" Wood	Replace New Sign on New Post
146.483	Rt.	Horizontal Double Arrow	W1-7	48	24		8.0	10		1		1	W	Telespar	Replace New Sign on New Post
146.537	Lt.	Bridge Ices Before Road	W8-13	36	36		9.0					1	N	Telespar	Replace New Sign on Existing Post
146.538	Rt.	No Passing Zone	W14-3	48X48X36			5.6	11		1		1	N	4" X 6" Wood	Replace New Sign on New Post
146.602	Lt.	Twin Lakes Public Water Access		114	48	38.0			30		2	1	N	4" X 6" Wood	Replace New Sign on New Post
					TOTAL	94.3	67.0	94.0	60.0	9.0	4.0	13.0			

PLOT SCALE - 1:0.08

PLOTTED FROM - TRMINT15

PLOT NAME - 5

FILE - ... \SIGNING NOTES TABLES 0367 & 04W8.DGN

Plotting Date: 02/06/2015

## PCN 04W8 Sign Summary US 281

Sign Code	Description	Width (Inches)	Height (Inches)	Sq. Ft.	Quantity	Flat Aluminum Sign, Nonremovable Copy High Intensity (SQFT)	Flat Aluminum Sign, Nonremovable Copy Super or Very High Intensity (SQFT)	Text / Background	
ADO-1	Hand-E-Hands 4-H Club	36	12	3.0	1	3.0		Blue Legend, White Background, Red Border	
ADO-5	Adopt-A-Highway	36	36	9.0	1	9.0		Blue Legend, White Background, Red Border	
ADO-6	Liter Crew Ahead	30	30	6.3	1	6.3		Black on Orange	
	Twin Lakes Public Water Access	114	48	38.0	2	76.0		White on Brown	
R1-1	Stop	30	30	5.2	4		20.8	White on Red	
W14-3	No Passing Zone	48X48X36		5.6	2		11.2	Black on Fluorescent Yellow	
W1-4L	Left Reverse Curve Arrow	36	36	9.0	1		9.0	Black on Fluorescent Yellow	
W1-7	Horizontal Double Arrow	48	24	8.0	1		8.0	Black on Fluorescent Yellow	
W8-13	Bridge Ices Before Road	36	36	9.0	2		18.0	Black on Fluorescent Yellow	
<b>Totals</b>							<b>94.3</b>	<b>67.0</b>	

PLOT SCALE - 1:0.08

PLOTTED FROM - TRMINT15

PLOT NAME - 6

FILE - ... \SIGNING NOTES TABLES 0367 & 04W8.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	44	75

Plotting Date: 02/06/2015

PLOT SCALE - 1:0.08

PLOT NAME - 7

FILE - ... \SIGNING NOTES TABLES 0367 & 04WB.DGN

**GENERAL PERMANENT SIGNING NOTES**

Permanent sign locations shall be staked in the field by the Contractor and checked by the Engineer. The Contractor shall give the Engineer a minimum of one week to check staked locations prior to sign/post installation.

The Contractor shall be responsible for contacting South Dakota One Call to locate the utilities at the staked sign installation locations.

Prior to ordering sign posts, the Contractor shall verify post lengths. The height of the post shall not exceed the minimum height needed by more than 0.5 feet. Any portion that extends above the sign shall be cut off. No separate payment will be made for cutting the post or for that length cut off.

**REMOVE EXISTING SIGNS**

Existing signs within the project limits are summarized in the Sign Table. This table provides the approximate MRM location for each sign. Existing signs in the table are indicated to be removed and not reused.

All existing signs and hardware listed to be removed shall become the property of the Contractor.

Holes remaining from the removal of 4"x6" wood posts shall be backfilled and compacted with material placed in layers not to exceed 6 inches in depth.

All costs associated with the removal of existing signs, posts, hardware, and backfilled holes shall be incidental to the contract unit price per each for Remove Traffic Sign.

All existing sign posts and/or sign bases shall be removed in their entirety.

**DATE DECALS**

The Contractor shall furnish and affix a date decal to each new sign installed.

Date decals shall be self-adhesive weather resistant stickers with removable paper backing, approximately 2" X 2" in size. The date decal shall display the last two digits of the year the sign was manufactured with black numerals on a white background.



One decal shall be placed in the extreme lower left corner of the front of each extruded aluminum panel sign, or the extreme lower left corner of the back of each flat aluminum sign.

Sign supports or other obstructions shall not block the view of the date decal upon completion of the sign installation.

All costs to furnish and install date decals on new signs shall be incidental to the contract unit price per square foot for Flat Aluminum Sign, Nonremovable Copy High Intensity, or Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity.

**NEW PERMANENT SIGNING**

New signs for installation are summarized in the Sign Table.

**Sign Design**

Signs shall be constructed as required per the Manual on Uniform Traffic Control Devices (MUTCD), the latest edition of "Standard Highway Signs", and as specified on the Special Sign Design sheets.

All sign material shall comply with Section 982 of the Specifications.

All upper/lower case letters and numerals shall be as required per the MUTCD, the latest edition of "Standard Highway Signs", and as illustrated on the Special Sign Design sheets.

The Contractor shall furnish the Aberdeen Region Traffic Engineer (P.O. Box 1767; Aberdeen, SD 57402) with a detailed sign layout sheet for each sign shown. These detailed sign layouts shall be approved by the Region Traffic Engineer prior to ordering the signs.

**Sign Sheeting**

Signs shall be constructed using High Intensity (ASTM D4956 Type IV) or Super/Very High Intensity (ASTM D4956 Type XI) reflective sheeting as summarized in the US 281 Permanent Sign Installation Tables.

All signs shall be manufactured in accordance with the sheeting manufacturer's recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlay films. Digitally printed signs will not be accepted.

All black legend and borders shall be nonreflectorized (unless otherwise specified in these plans).

**Sign Installation Hardware**

Aluminum U-Channel stiffeners shall be used on all standard highway signs greater than 36 inches in width and shall conform to Alloy 6063-T6 or 6061-T6. The U-Channel shall be 2 inches in width and free of holes. The U-Channel stiffeners shall also be used to connect various signs together so that an entire sign assembly can be erected on a single installation.

Stiffeners may be fastened to signs by use of 1/4 inch diameter drive rivets.

Refer to the Breakaway Sign Supports diagram for typical sign and stiffener details.

The Contractor shall use 3/8 inch diameter rust proof machine sign bolts, flat metal washers, neoprene washers (against the sign sheeting), lock washers, and nuts to fasten the sign to the channel aluminum and posts. A minimum of two bolts shall extend through each post.

All costs associated with furnishing and installing the new permanent signs, and with furnishing and installing stiffeners and hardware shall be incidental to the contract unit price per square foot for Flat Aluminum Sign, Nonremovable Copy High Intensity, or Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity.

**SQUARE TUBE ANCHOR SLEEVE**

The Contractor shall furnish and install new square tube anchor sleeve as follows:

2.5" x 18", 12 Gauge square tube anchor sleeve.

A 2.25" x 2.25" x 4' perforated tube post (12 Gauge) shall be used as the anchor post for installation with the square tube anchor sleeve.

**SQUARE TUBE POST SLEEVE**

All 2.5" x 2.5" perforated tube post (10 Gauge) shall be sleeved with a 2 3/16" x 2 3/16"x4' perforated tube post (10 Gauge).

**WINGED SLIP BASE ANCHOR**

The Contractor shall furnish and install new winged slip base anchor as required per the plans.

Winged slip base anchor shall be installed using direct drive method.

Winged slip base anchor shall consist of a slip base (upper), 48 inch long winged anchor (lower), and hardware kit.

**MILEAGE REFERENCE MARKERS**

MRMs (Mileage Reference Markers) are not to be disturbed. If an MRM is attached to a sign listed for replacement it shall be salvaged and reattached to the new sign in the same location. Payment for this work shall be incidental to the various signing contract items.

PLOTTED FROM - TRM\INT15

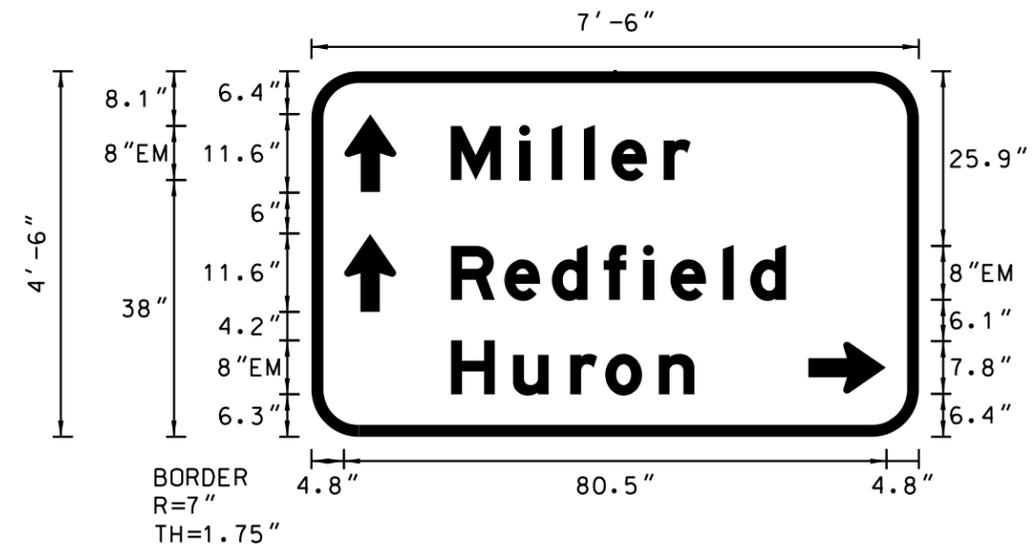
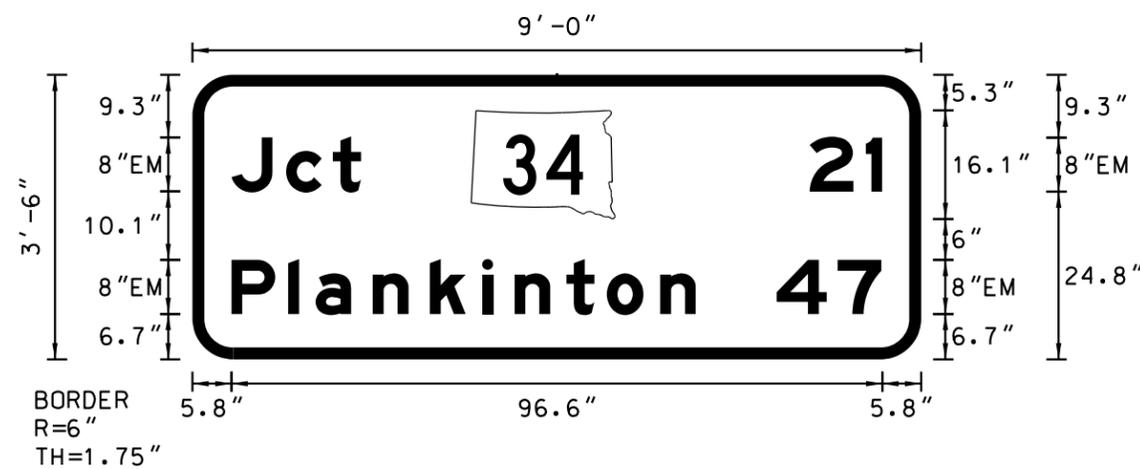
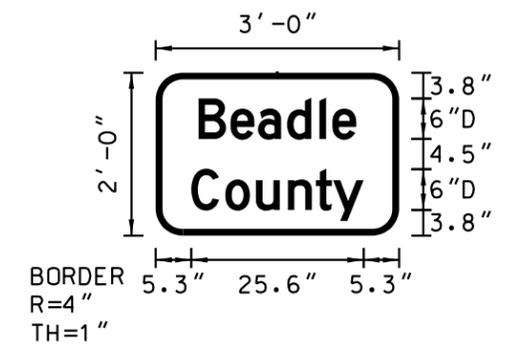
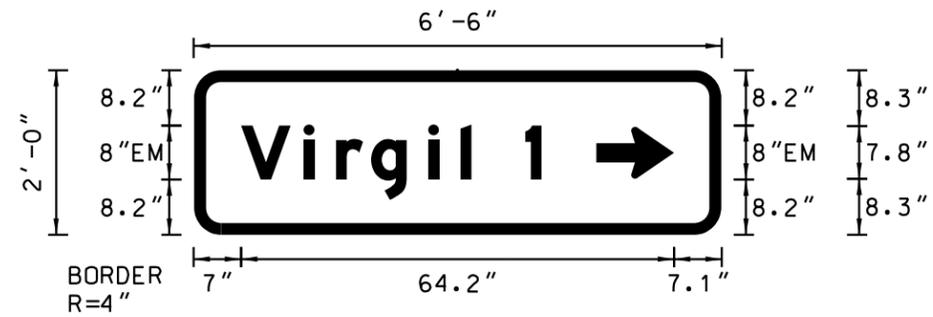
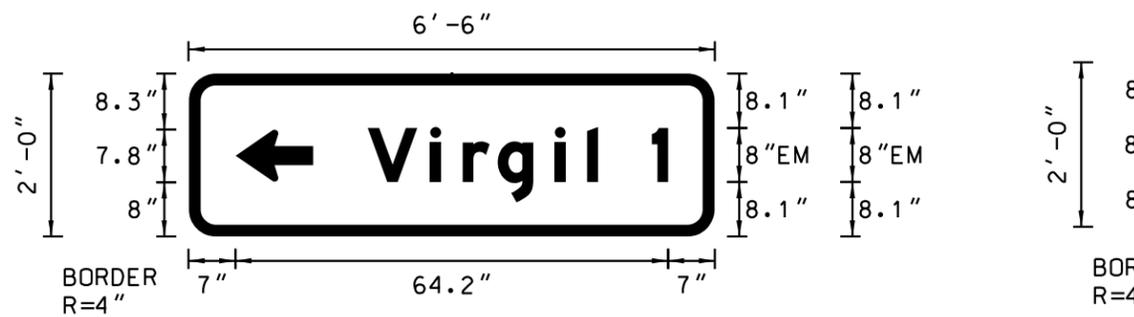
# SPECIAL SIGN DESIGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	45	75

Plotting Date: 02/06/2015

PLOT SCALE - 1:2.26

PLOT NAME - 8



All signs on this sheet shall have a green background with white legend and white border

PLOTTED FROM - IRWJINT15

FILE - ...SPECIAL SIGN DESIGN.DGN

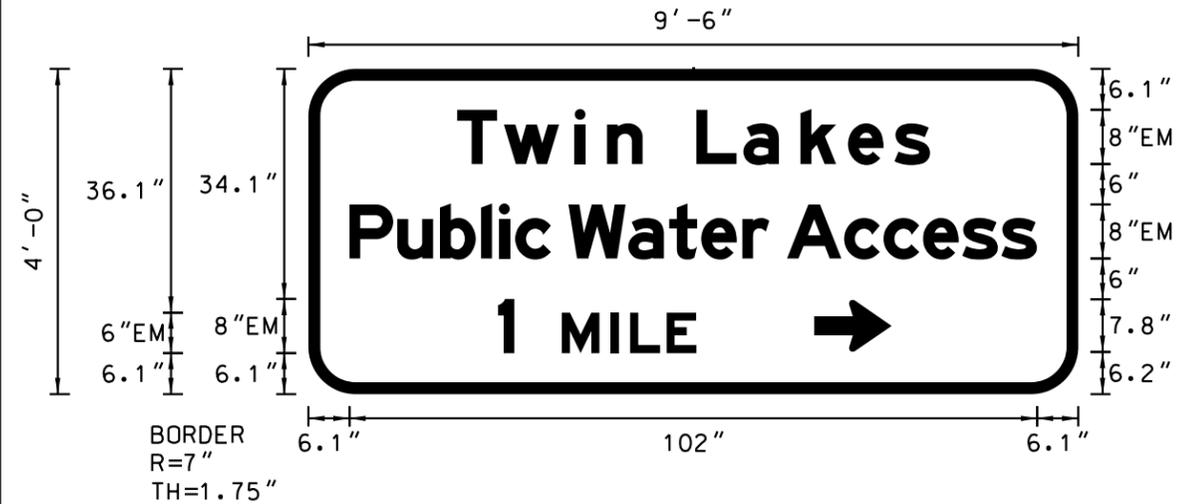
# SPECIAL SIGN DESIGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	46	75

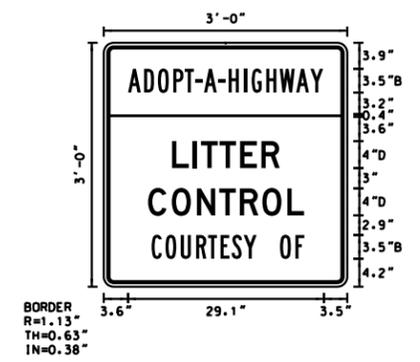
Plotting Date: 02/06/2015

PLOT SCALE - 1:2.26

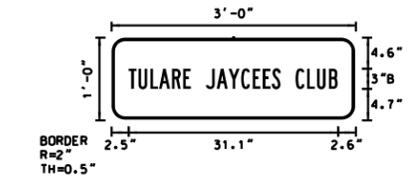
PLOT NAME - 9



Border - Red  
Background - White  
Legend - Blue

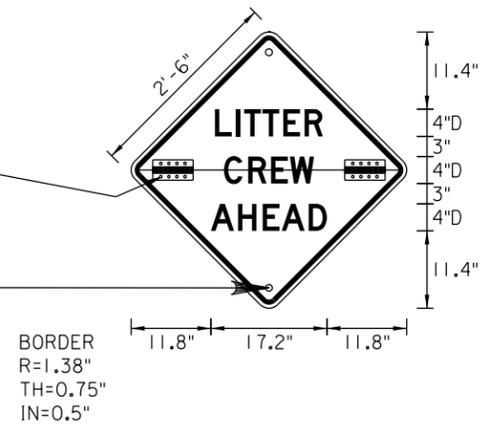


Border - Red  
Background - White  
Legend - Blue

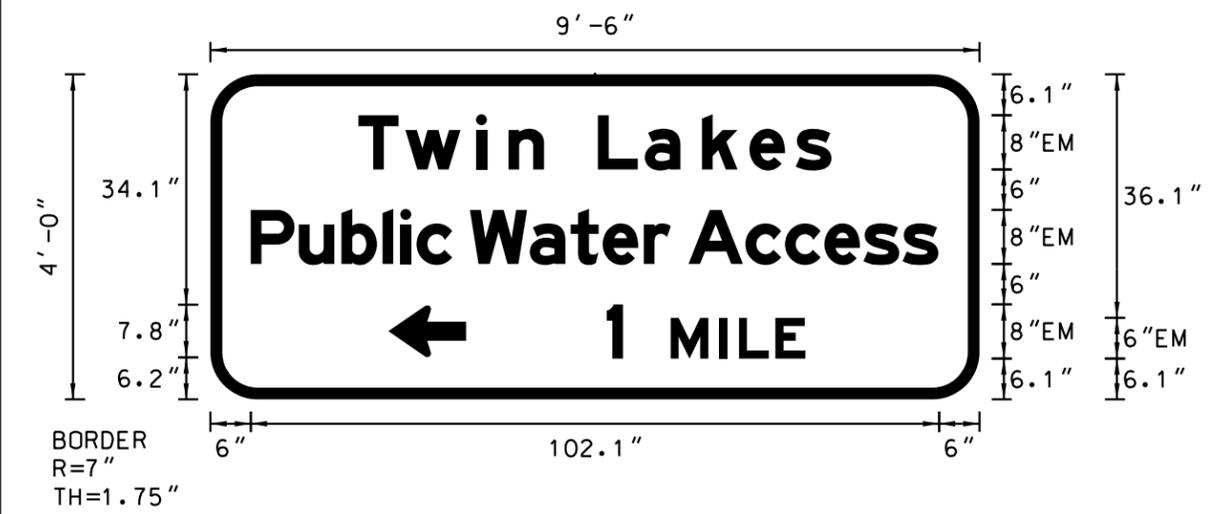


Stainless Steel  
Piano Hinge  
3" H x 6" L

3/8" x 3"  
Stainless Steel  
Bolt with Wing  
Nut. (secure folded  
sign in place)



Border - Black  
Background - Orange  
Legend - Black



Above signs shall have a brown background with white legend and white border

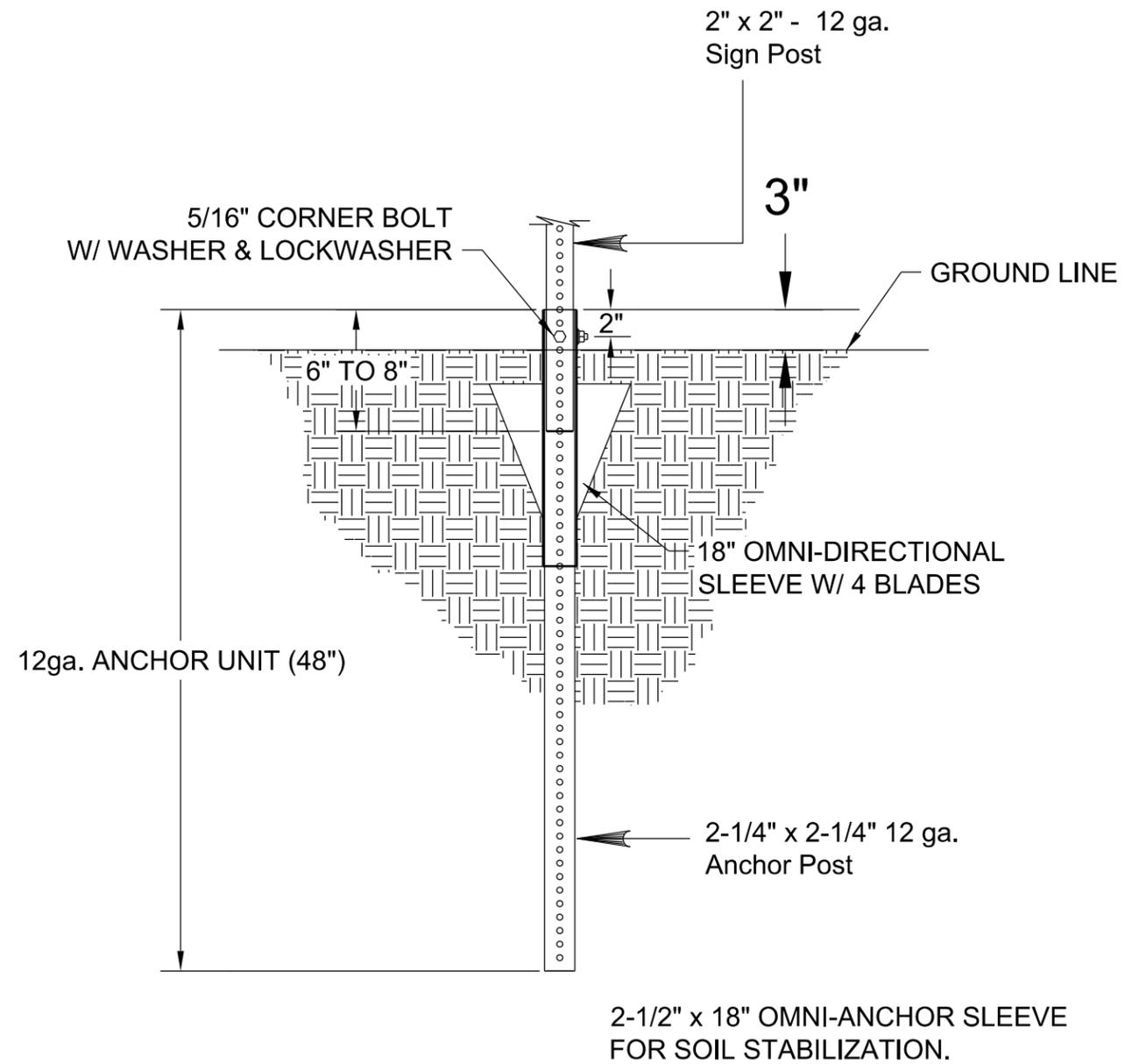
PLOTTED FROM - TRWJINT15

FILE - ... \SPECIAL SIGN DESIGN.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	47	75

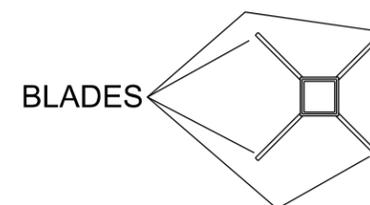
Plotting Date: 02/06/2015

# SQUARE TUBE 4 BLADE ANCHOR DETAIL



ANCHOR SLEEVE  
TOP VIEW

2-1/2" x 18" 12 ga. Omni-Sleeve



PLOT SCALE - 1:200

PLOTTED FROM - TRM\INT15

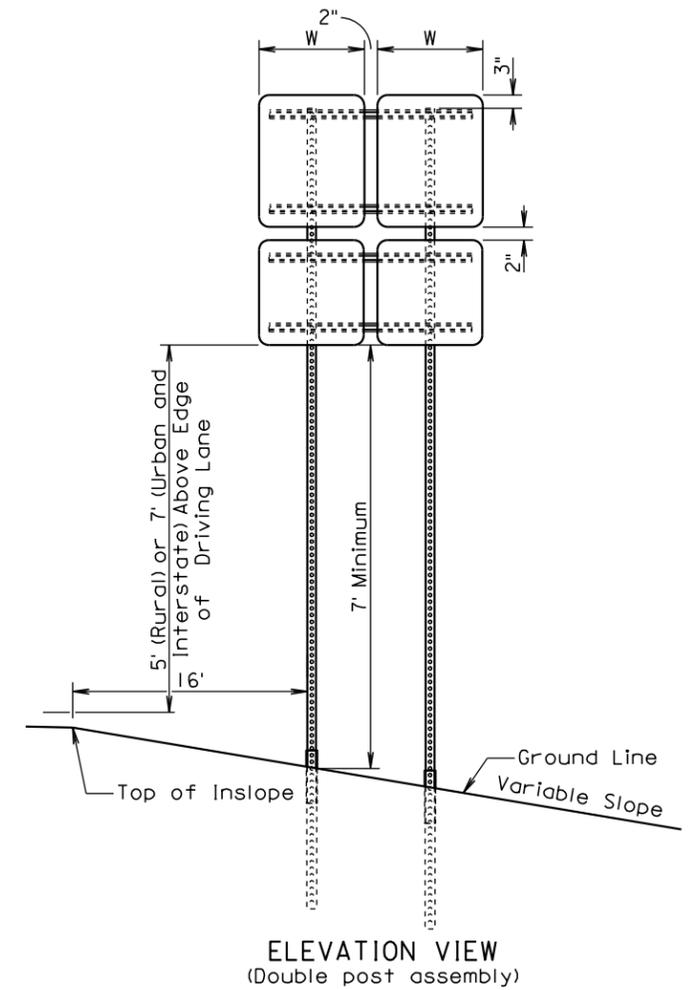
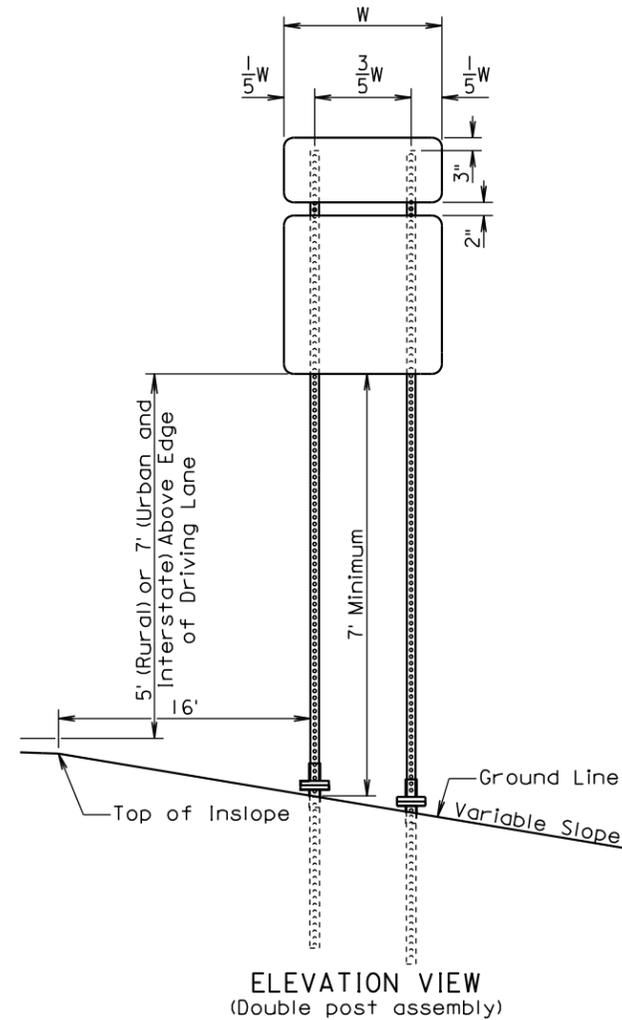
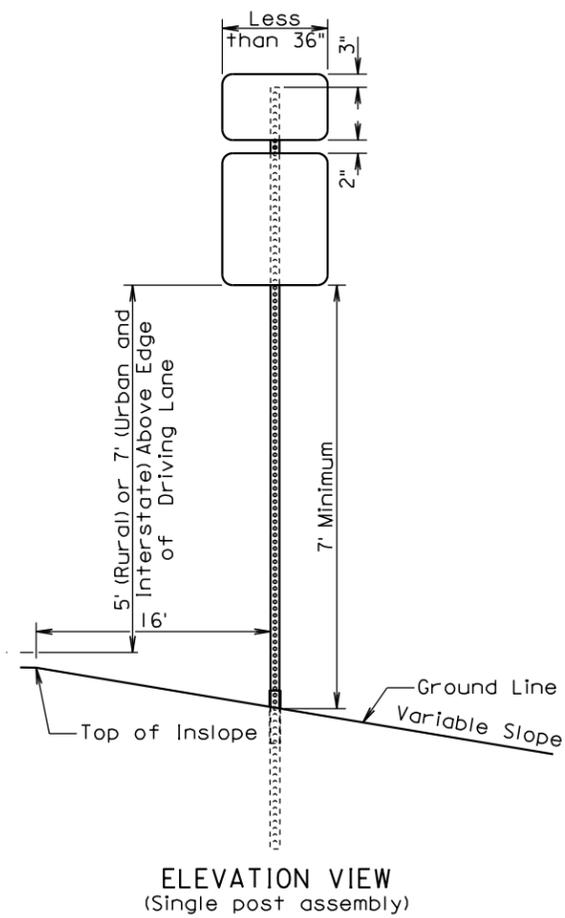
PLOT NAME - 10

FILE - ... \SIGN POST INSTALL DETAILS.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	48	75

Plotting Date: 02/06/2015

# INSTALLATION DETAILS FOR MULTIPLE SIGN ASSEMBLIES



## GENERAL NOTES:

The sign posts and bases shown are for illustrative purpose. The post type required shall be the type specified in the plans.

All breakaway sign supports shall comply with NCHRP 350 or MASH crash testing requirements and FHWA requirements. The Contractor shall provide post installation details at the preconstruction meeting for all breakaway sign support assemblies.

PLOT SCALE - 1:200

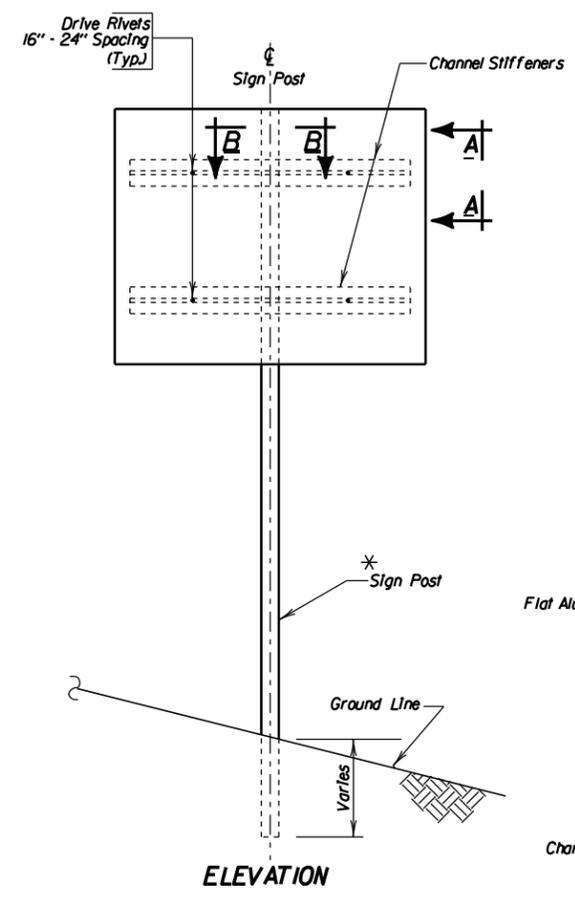
PLOTTED FROM - TRW\INT15

PLOT NAME - 11

FILE - ...SIGN POST INSTALL DETAILS.DGN

# ONE POST BREAKAWAY SIGN SUPPORTS

# TWO POST BREAKAWAY SIGN SUPPORTS

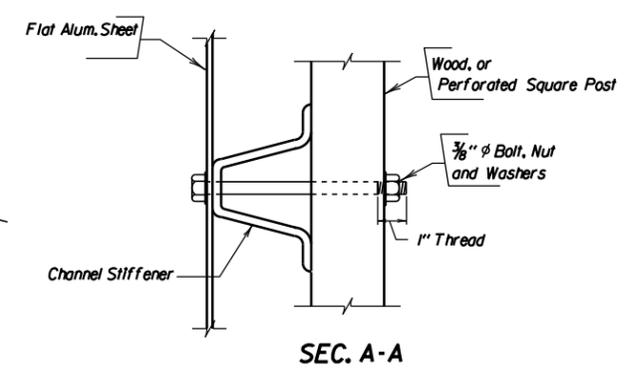


∅ A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.

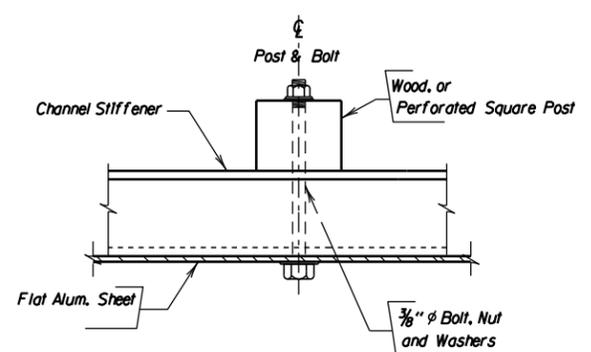
Height and lateral distance as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

\* Single post installation shown. (See applicable Details or Standard Plates shown in these plans for multiple post spacing requirements.)

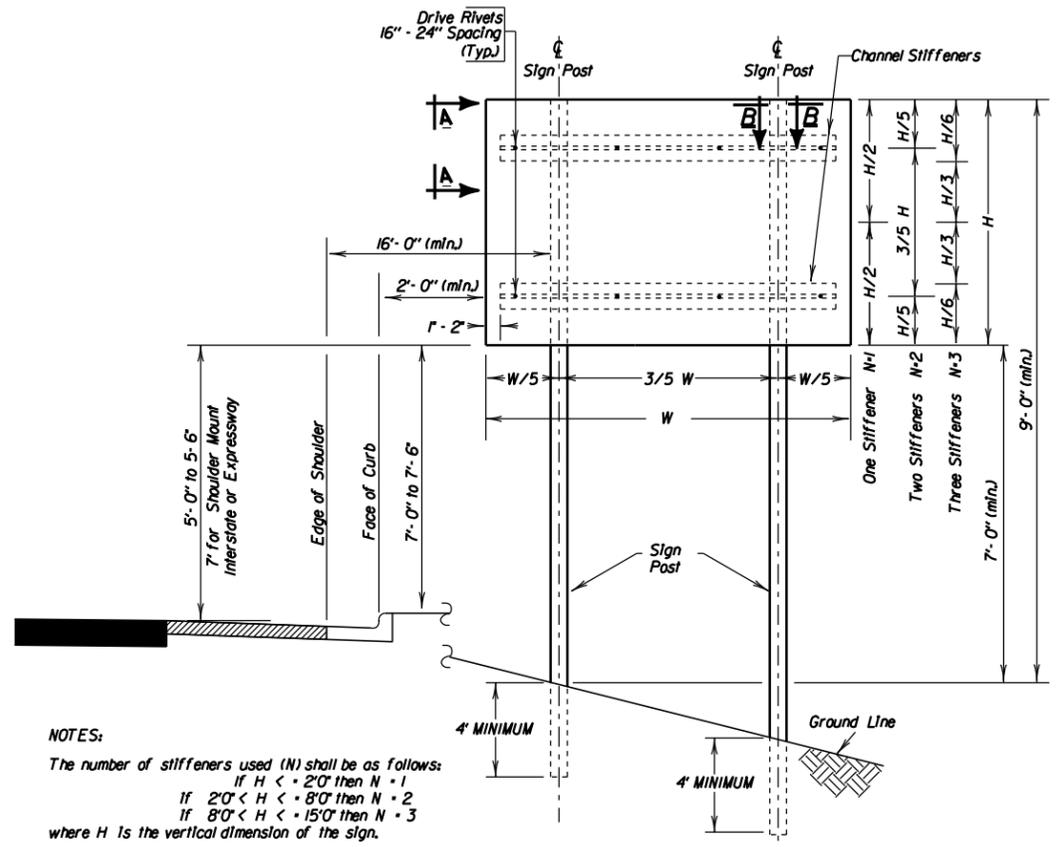
## (Typical Sign and Stiffener Details)



SEC. A-A



SEC. B-B



NOTES:

The number of stiffeners used (N) shall be as follows:

- If  $H < 2'0''$  then  $N = 1$
- If  $2'0'' < H < 8'0''$  then  $N = 2$
- If  $8'0'' < H < 15'0''$  then  $N = 3$

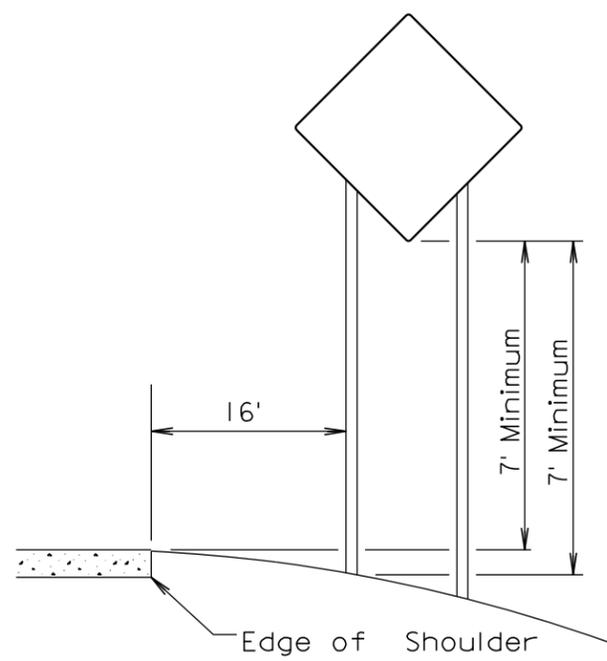
where H is the vertical dimension of the sign.

A minimum of two bolts shall be required to fasten the sign to each post.

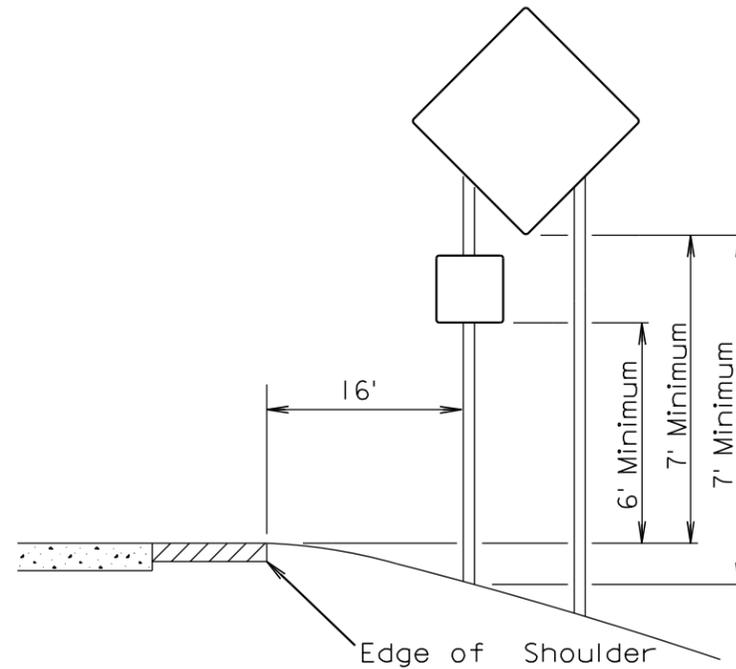
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	50	75

Plotting Date: 02/06/2015

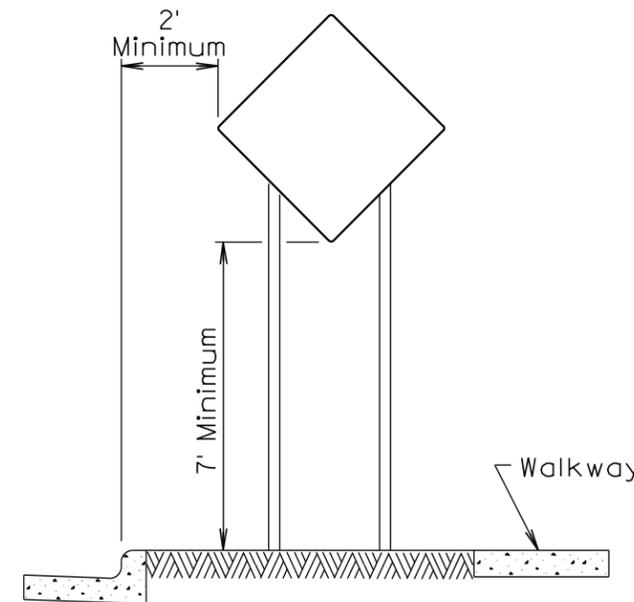
# SIGN SUPPORTS (Lateral Off-Sets)



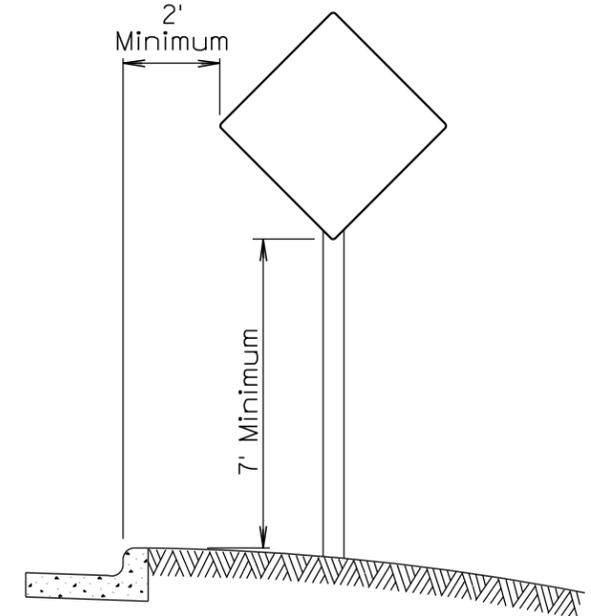
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT



URBAN DISTRICT

PLOT SCALE - 1:200

PLOTTED FROM - TRWJINT15

PLOT NAME - 13

FILE - ...SIGN POST INSTALL DETAILS.DGN

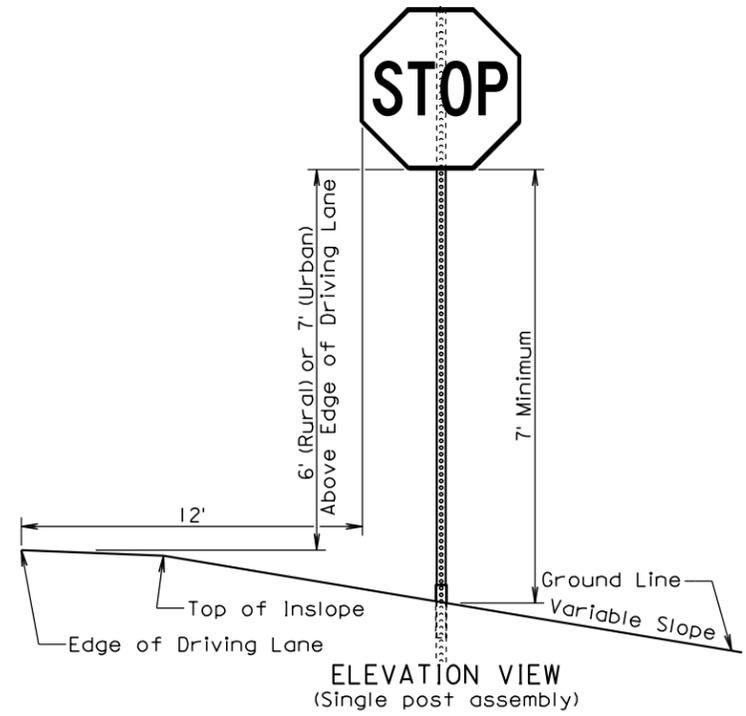
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	51	75

Plotting Date: 02/06/2015

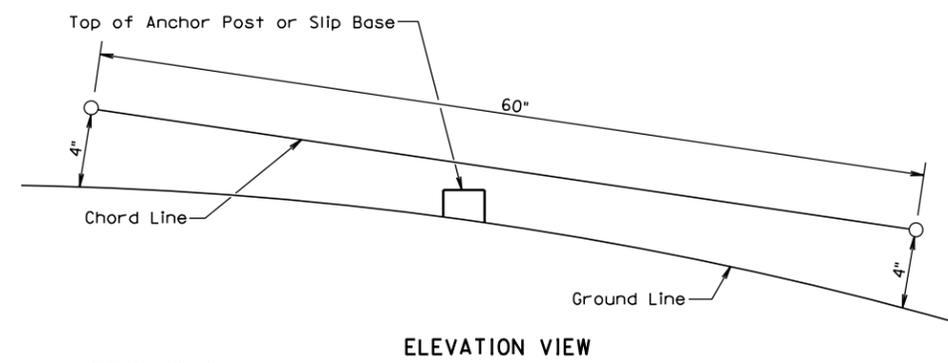
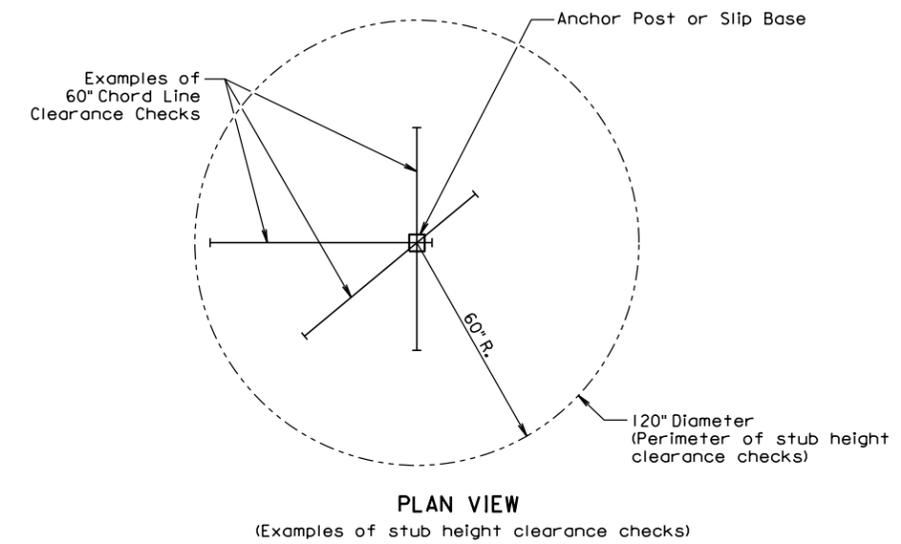
PLOT SCALE - 1:200

PLOT NAME - 14

# INSTALLATION DETAILS FOR STOP SIGNS



# BREAKAWAY SUPPORT STUB CLEARANCE



**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.

PLOTTED FROM - TRWJINT15

FILE - ... \SIGN POST INSTALL DETAILS.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	52	75

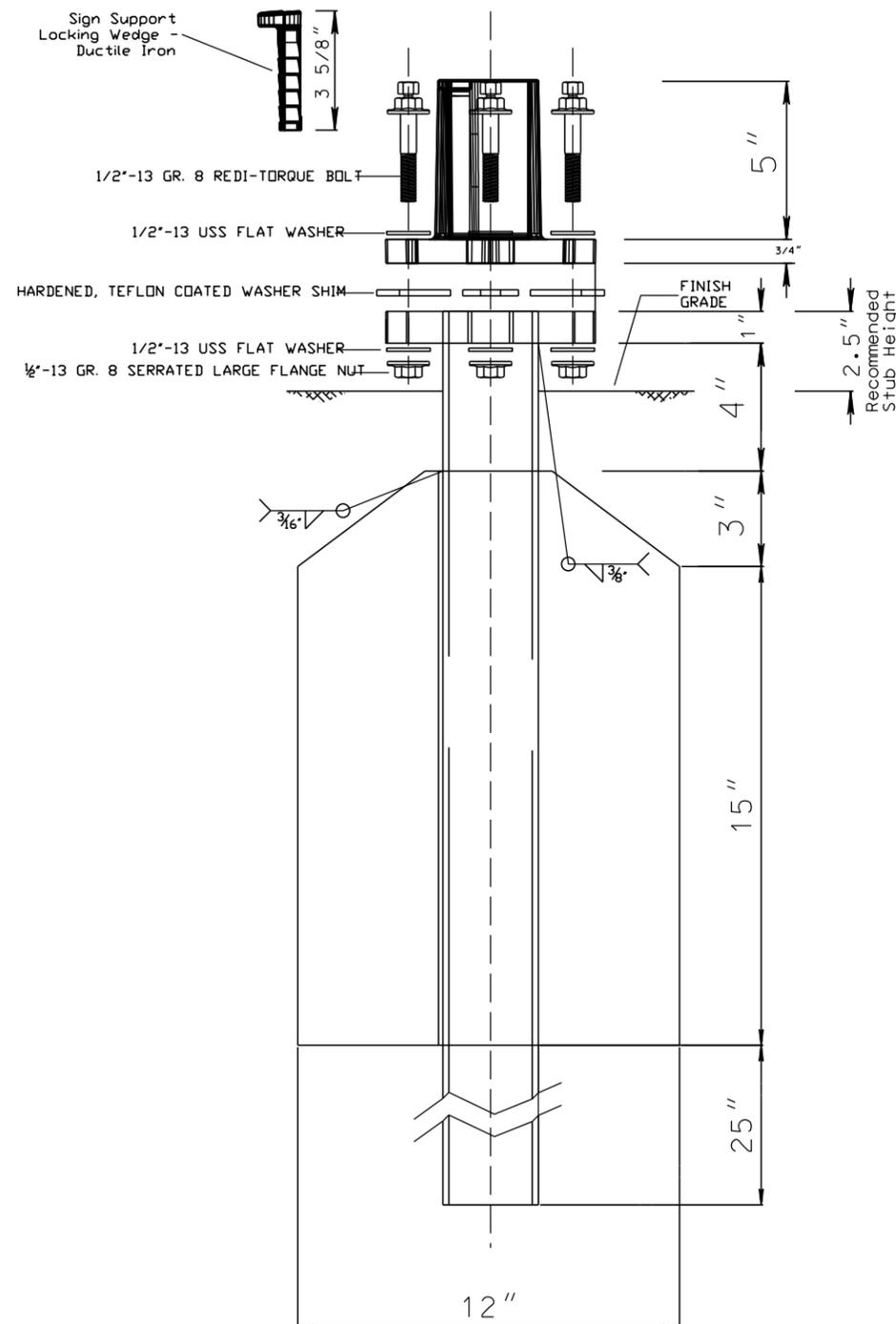
Plotting Date: 02/06/2015

PLOT SCALE - 1:0.88

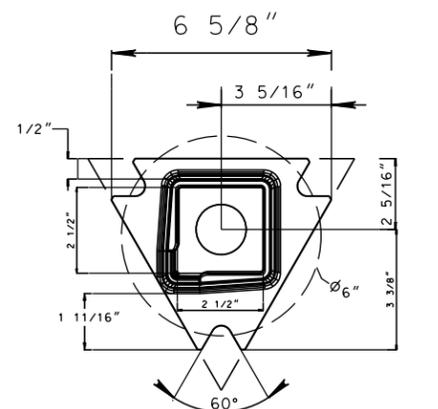
PLOT NAME - 15

FILE - ... WINGED ANCHOR SLIP BASE 1-09.DGN

# 48" WINGED ANCHOR SLIP BASE

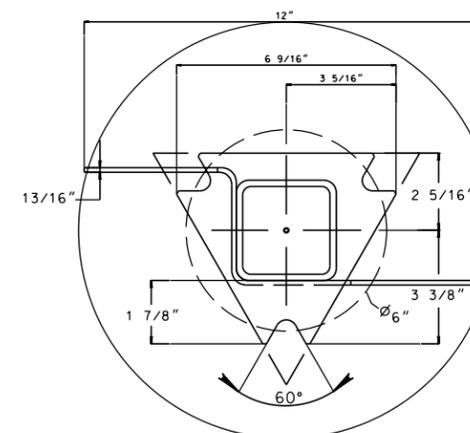


TOP POST RECEIVER  
for 2-1/2" SQUARE POST



MATERIAL:  
DUCTILE IRON CASTING, CLASS 65-45-12

BOTTOM UNIBASE  
SOIL STUB

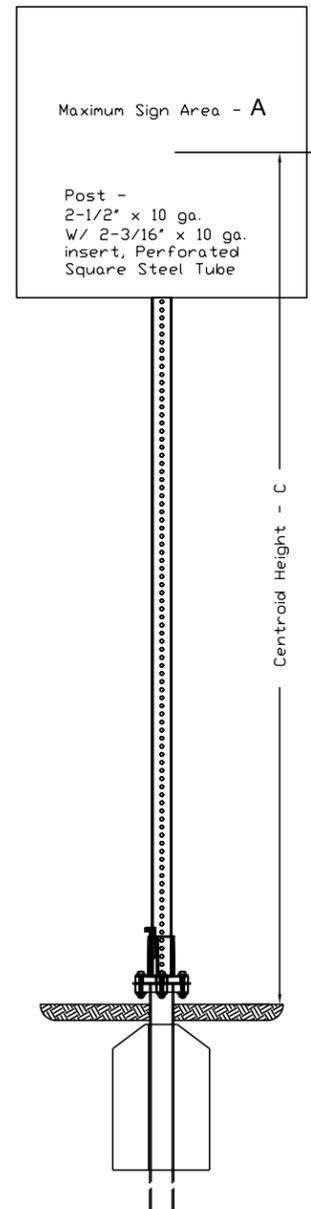


MATERIALS:  
Tube - 3' x 3' x 7 ga. ASTM A500 Grade B tube  
Stabilizing Wing - 7 ga. H.R.P.O. ASTM A 569  
Plate - ASTM A572 grade 50

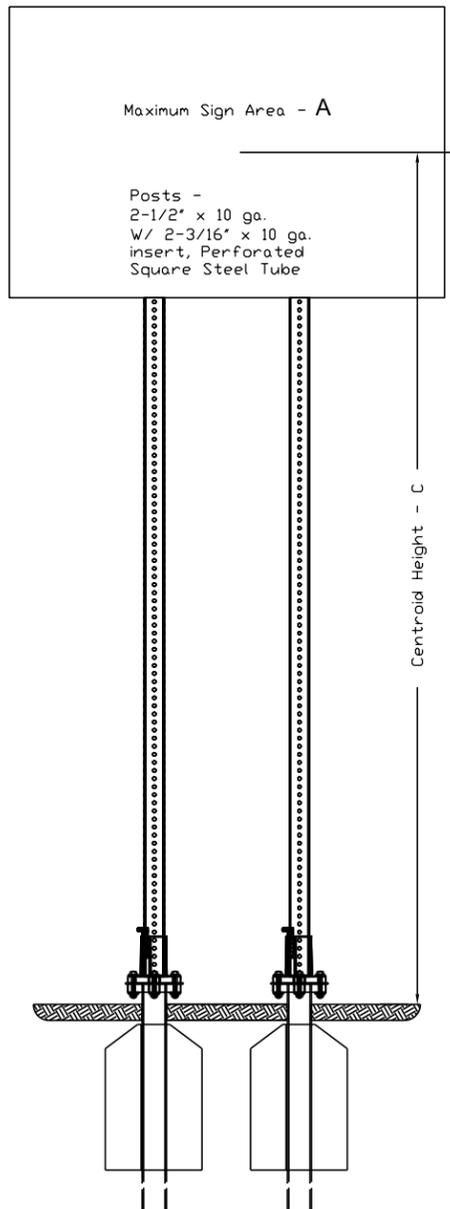
PLOTTED FROM - IRWJINT15

# 48" WINGED SLIP BASE

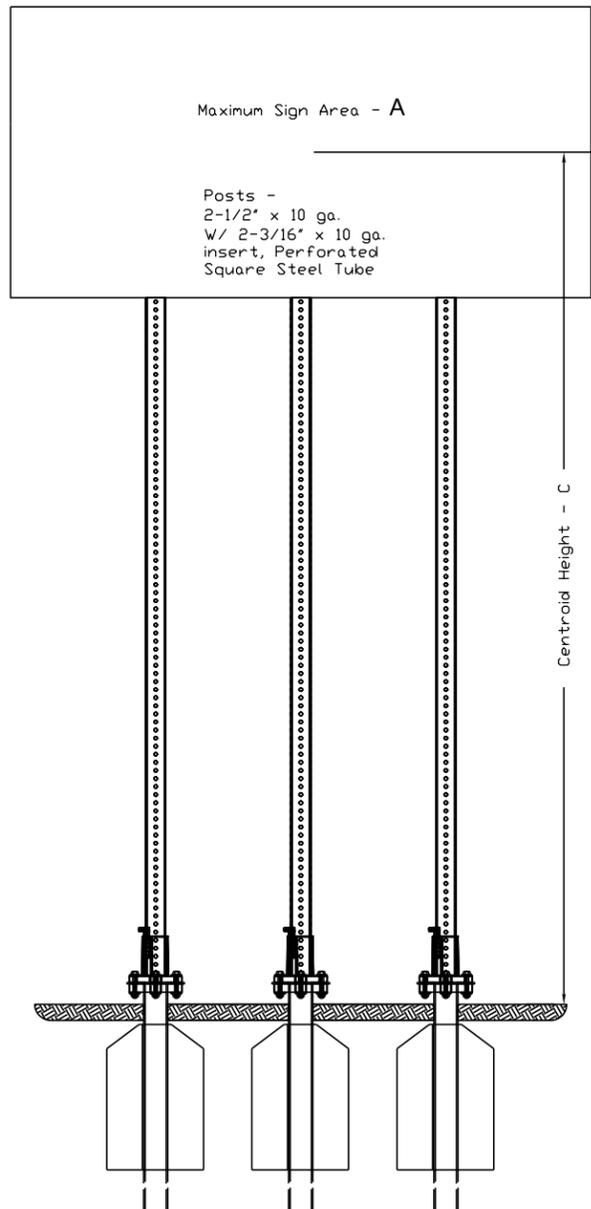
## Post and Wind Load Information



centroid - C	Maximum Sign Area - A
8 ft.	42 ft <sup>2</sup>
9 ft.	38 ft <sup>2</sup>
10 ft.	34 ft <sup>2</sup>
11 ft.	30 ft <sup>2</sup>
12 ft.	28 ft <sup>2</sup>
13 ft.	26 ft <sup>2</sup>
14 ft.	24 ft <sup>2</sup>
15 ft.	22 ft <sup>2</sup>
16 ft.	20 ft <sup>2</sup>

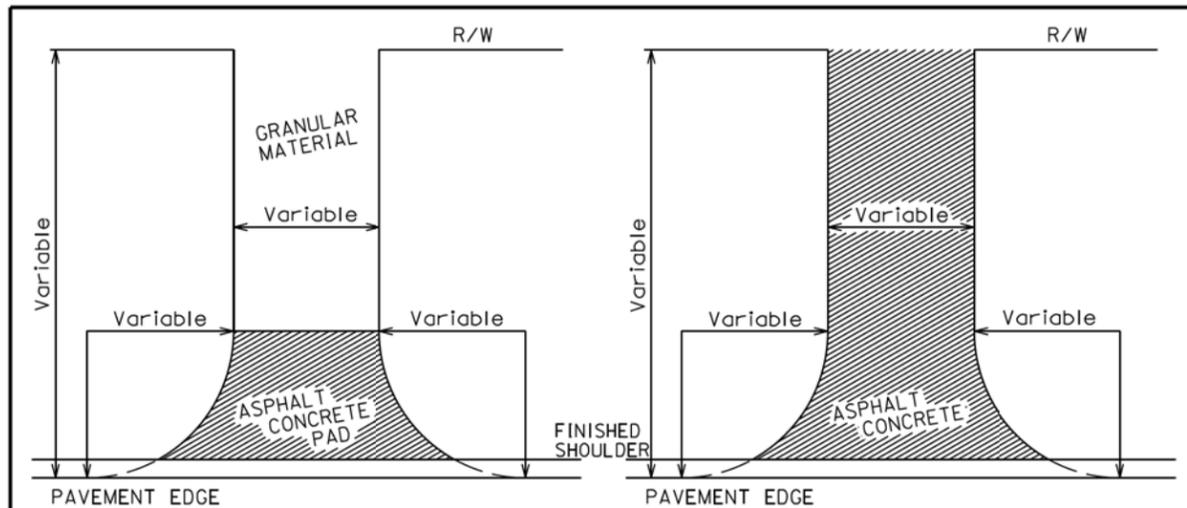


centroid - C	Maximum Sign Area - A
8 ft.	84 ft <sup>2</sup>
9 ft.	76 ft <sup>2</sup>
10 ft.	68 ft <sup>2</sup>
11 ft.	60 ft <sup>2</sup>
12 ft.	56 ft <sup>2</sup>
13 ft.	52 ft <sup>2</sup>
14 ft.	48 ft <sup>2</sup>
15 ft.	44 ft <sup>2</sup>
16 ft.	40 ft <sup>2</sup>



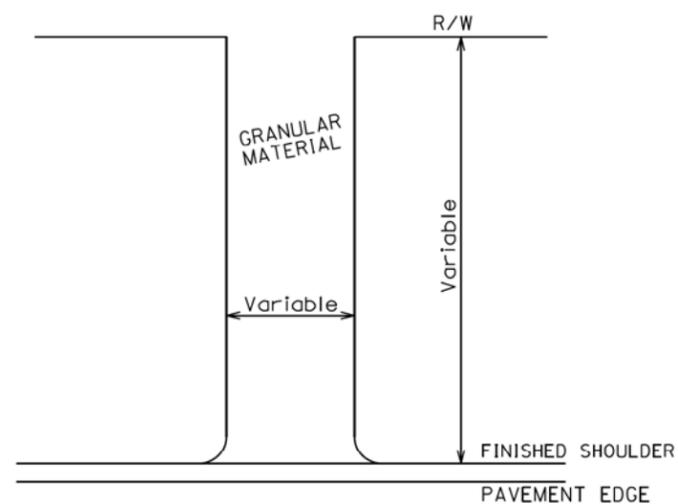
centroid - C	Maximum Sign Area - A
8 ft.	126 ft <sup>2</sup>
9 ft.	114 ft <sup>2</sup>
10 ft.	102 ft <sup>2</sup>
11 ft.	90 ft <sup>2</sup>
12 ft.	84 ft <sup>2</sup>
13 ft.	78 ft <sup>2</sup>
14 ft.	72 ft <sup>2</sup>
15 ft.	66 ft <sup>2</sup>
16 ft.	60 ft <sup>2</sup>

Plotting Date: 02/06/2015



INTERSECTING ROAD  
NO ASPHALT CONCRETE SURFACING  
BEYOND R/W

INTERSECTING ROAD  
ASPHALT CONCRETE SURFACING  
BEYOND R/W



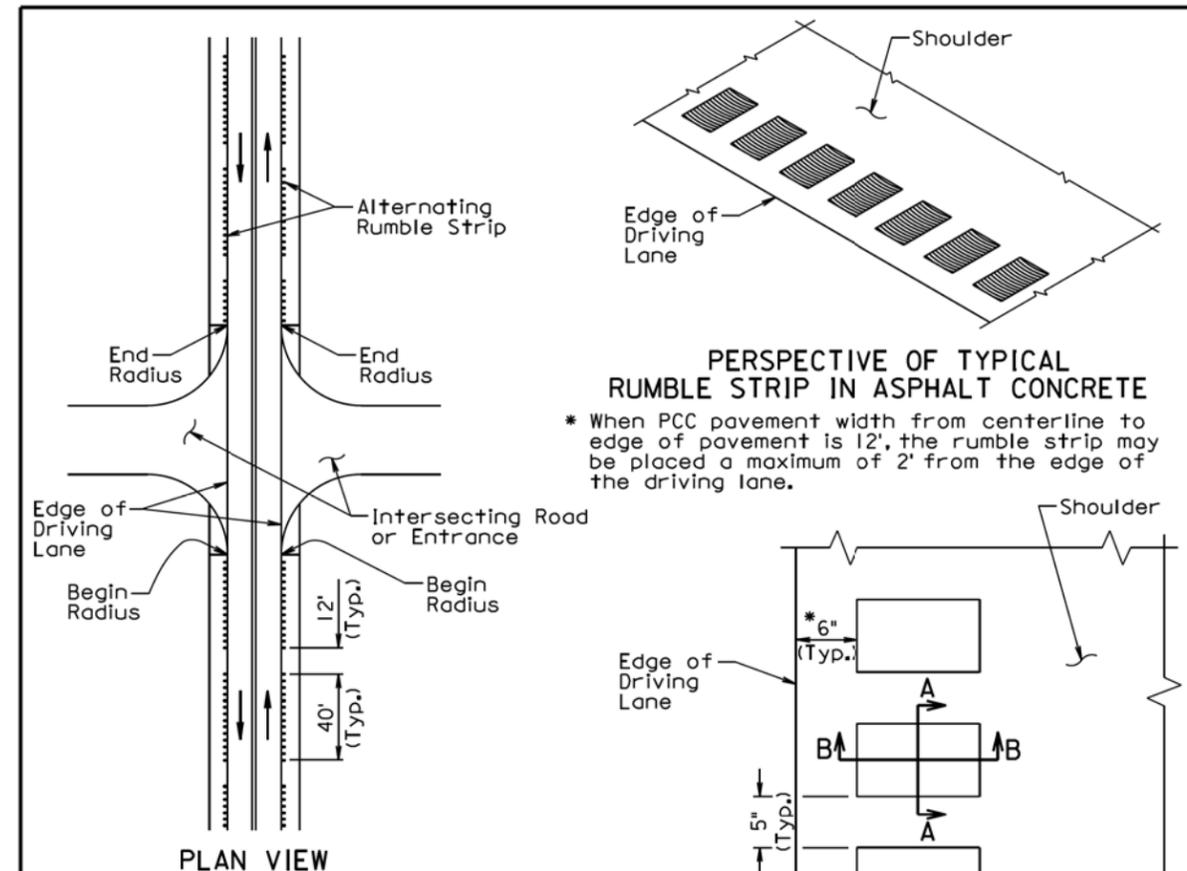
ENTRANCE

The surfacing details shown on this sheet are provided as a guide for surfacing these facilities. The precise construction limits for situations other than the standards shown will be determined by the Engineer, at the time of construction.

ROADWAY WITH SHOULDER

March 31, 2000

<b>S D D O T</b>	<b>RESURFACING OF INTERSECTING ROADS AND ENTRANCES</b>	PLATE NUMBER 320.11
		Sheet 1 of 1
		Published Date: 1st Qtr. 2015



PERSPECTIVE OF TYPICAL  
RUMBLE STRIP IN ASPHALT CONCRETE

\* When PCC pavement width from centerline to edge of pavement is 12', the rumble strip may be placed a maximum of 2' from the edge of the driving lane.

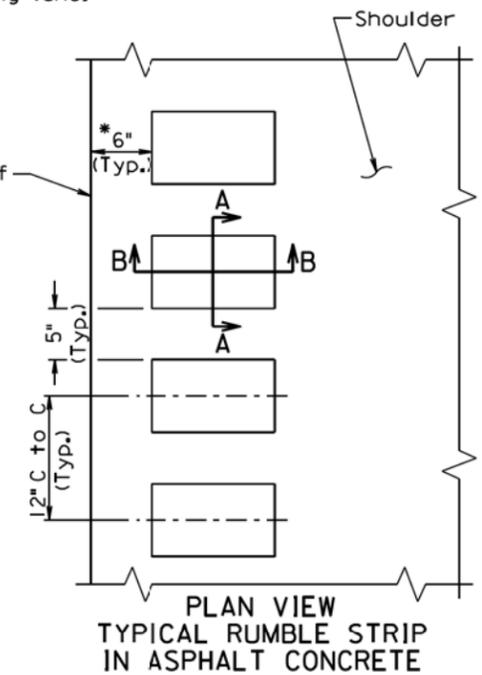
GENERAL NOTES:

A rumble strip shall be constructed on all of the asphalt concrete shoulders by grinding alternating patterns of 40' continuous indentations in the asphalt concrete. The rumble strip shall receive a flush seal with the shoulder flush sealing or asphalt surface treatment.

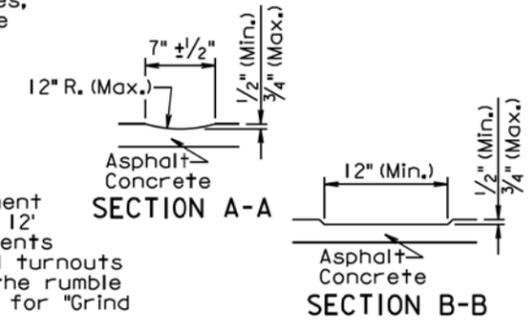
A rumble strip shall not be constructed through intersecting roads, entrances, and turnouts. The lengths of the 40' segments with continuous indentations and the 12' segments without a rumble strip adjacent to the intersecting roads, entrances, and turnouts shall be adjusted as approved by the Engineer.

Prior to constructing the rumble strip the Contractor shall submit to the Engineer, for approval, the proposed method of constructing the rumble strip.

Measurement of the rumble strip shall be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble strip shall include the 12' long segments without rumble strips and the segments adjacent to the intersecting roads, entrances, and turnouts without rumble strips. Payment for constructing the rumble strip shall be at the contract unit price per mile for "Grind 12" Rumble Strip or Stripe in Asphalt Concrete".



PLAN VIEW  
TYPICAL RUMBLE STRIP  
IN ASPHALT CONCRETE



SECTION A-A

SECTION B-B

June 26, 2011

<b>S D D O T</b>	<b>12" RUMBLE STRIP IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS</b>	PLATE NUMBER 320.24
		Sheet 1 of 1
		Published Date: 1st Qtr. 2015

PLOT SCALE - 1:200

PLOTTED FROM - TRWJ1115

PLOT NAME - 1

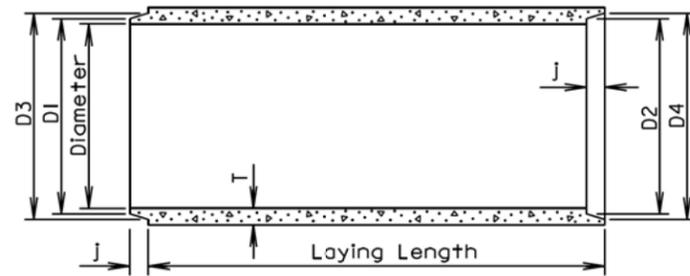
FILE - ... \STD PLATES 0367 & 04WB.DGN

PLOT SCALE - 1:200

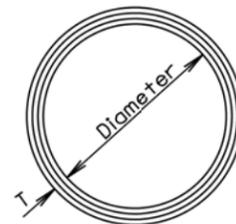
PLOT NAME - 2

**TOLERANCES IN DIMENSIONS**

Diameter:  $\pm 1.5\%$  for 24" Dia. or less and  $\pm 1\%$  or  $\frac{3}{8}$ " whichever is more for 27" Dia. or greater.  
 Diameters at Joints:  $\pm 3/16$ " for 30" Dia. or less and  $\pm 1/4$ " for 36" or greater.  
 Length of joint (j):  $\pm 1/4$ ".  
 Wall thickness (T): not less than design T by more than 5% or  $\frac{3}{16}$ ", whichever is greater.  
 Laying length: shall not underrun by more than  $\frac{1}{2}$ ".



**LONGITUDINAL SECTION**



**END VIEW**

**GENERAL NOTES:**

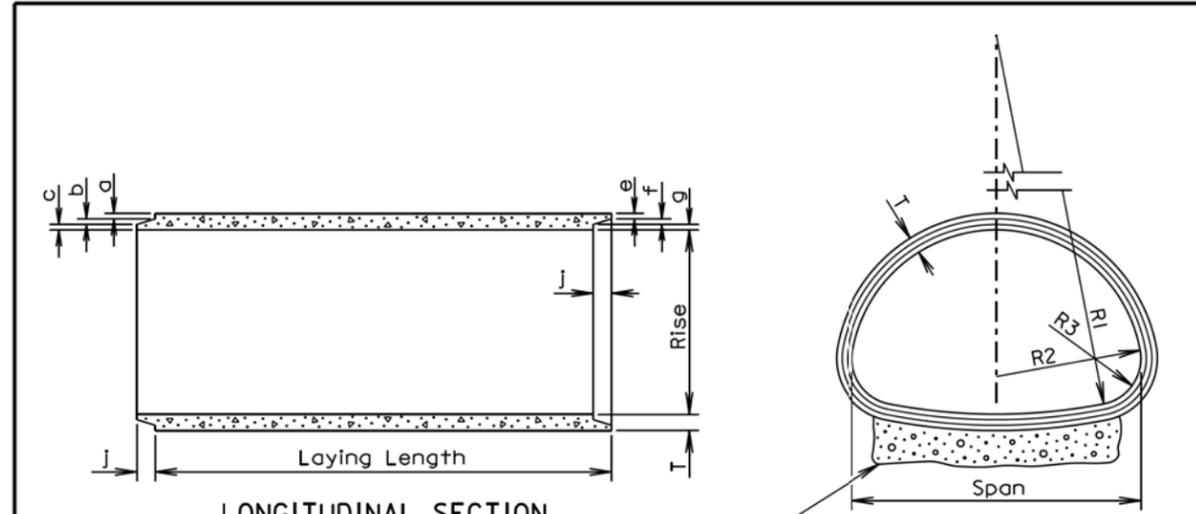
Construction of R. C. P. shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

Not more than 2 four foot sections shall be permitted near the ends of any culvert. Four foot lengths shall be used only to secure the required length of culvert.

Diam. (in.)	Approx. Wt./Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 3/8	14 1/4
15	127	2 1/4	2	16 1/2	16 3/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 1/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 3/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 1/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 3/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

March 31, 2000

<b>S D D O T</b>	<b>REINFORCED CONCRETE PIPE</b>	PLATE NUMBER <b>450.01</b>
	Published Date: 1st Qtr. 2015	Sheet 1 of 1



**LONGITUDINAL SECTION**

**END VIEW**

**TOLERANCES IN DIMENSIONS**

Radial dimensions at joints:  $\pm 1/8$ " for 65" span or less and  $\pm 1/4$ " for longer spans.  
 Rise and Span:  $\pm 2\%$  of tabular values.  
 Length of Joint (J):  $\pm 1/4$ ".  
 Wall thickness (T): not less than design T by more than 5% or  $\frac{3}{16}$ ", whichever is greater.  
 Laying length: shall not underrun by more than  $\frac{1}{2}$ ".

Gravel Bedding Material shall be supplied for 102" to 169" spans. It shall be placed to a thickness of 6" (min.) x 85% of the Span x Length of culvert and shall conform to the gradation requirements for gravel surfacing except material may be screened or may be plan provided material.

* Size (in.)	Approx. Wt./Ft. (lb.)	Rise (in.)	Span (in.)	T (in.)	a (in.)	b (in.)	c (in.)	J (in.)	e (in.)	f (in.)	g (in.)	R1 (in.)	R2 (in.)	R3 (in.)
18	170	13 1/2	22	2 1/2	1 3/8	3/8	3/4	2	1 1/8	3/8	1	27 1/2	13 3/4	5 1/4
24	320	18	28 1/2	3 1/2	1 5/8	1/2	1 3/8	3	1 3/8	1/2	1 5/8	40 1/16	14 3/4	4 5/8
30	450	22 1/2	36 1/4	4	1 13/16	5/8	1 9/16	3 1/2	1 9/16	5/8	1 13/16	51	18 3/4	6 1/8
36	600	26 5/8	43 3/4	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	62	22 1/2	6 1/2
42	740	31 5/16	51 1/8	4 1/2	2	3/4	1 3/4	4	1 3/4	3/4	2	73	26 1/4	7 3/4
48	890	36	58 1/2	5	2 1/4	3/4	2	5	2	3/4	2 1/4	84	30	8 7/8
54	1100	40	65	5 1/2	2 1/2	3/4	2 1/4	5	2 1/4	3/4	2 1/2	92 1/2	33 3/8	10
60	1400	45	73 1/2	6	3 5/16	3/4	1 5/16	5	2 3/4	3/4	2 1/2	105	37 1/2	11
72	1900	54	88	7	3 13/16	1	2 3/16	6	3 1/4	1	2 3/4	126	45	13 5/16
84	2500	62	102	8	4 1/8	1	2 7/8	6	3 1/2	1	3 1/2	162 1/2	52	14 1/2
96	3300	78	122 3/8	9	4 1/2	1	3 1/2	7	4	1	4	218	62	20
108	4200	88	138 1/2	10	5	1	4	7	4 1/2	1	4 1/2	269	70	22
120	5100	96 7/8	154	11	5 1/2	1	4 1/2	7	5	1	5	301 3/8	78	24
132	5100	106 1/2	168 3/4	10		1	4	7	4 1/2	1	4 1/2	329	85 5/8	26 7/8

\* Equivalent Diameter of Circular R. C. P.

**GENERAL NOTES:**

Construction of R.C.P. Arch shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges. Not more than 2 four foot sections shall be permitted near the ends of any culvert. Four foot lengths shall be used only to secure the required length of culvert.

March 31, 2000

<b>S D D O T</b>	<b>REINFORCED CONCRETE PIPE ARCH</b>	PLATE NUMBER <b>450.02</b>
	Published Date: 1st Qtr. 2015	Sheet 1 of 1

PLOTTED FROM - TRWJINT15

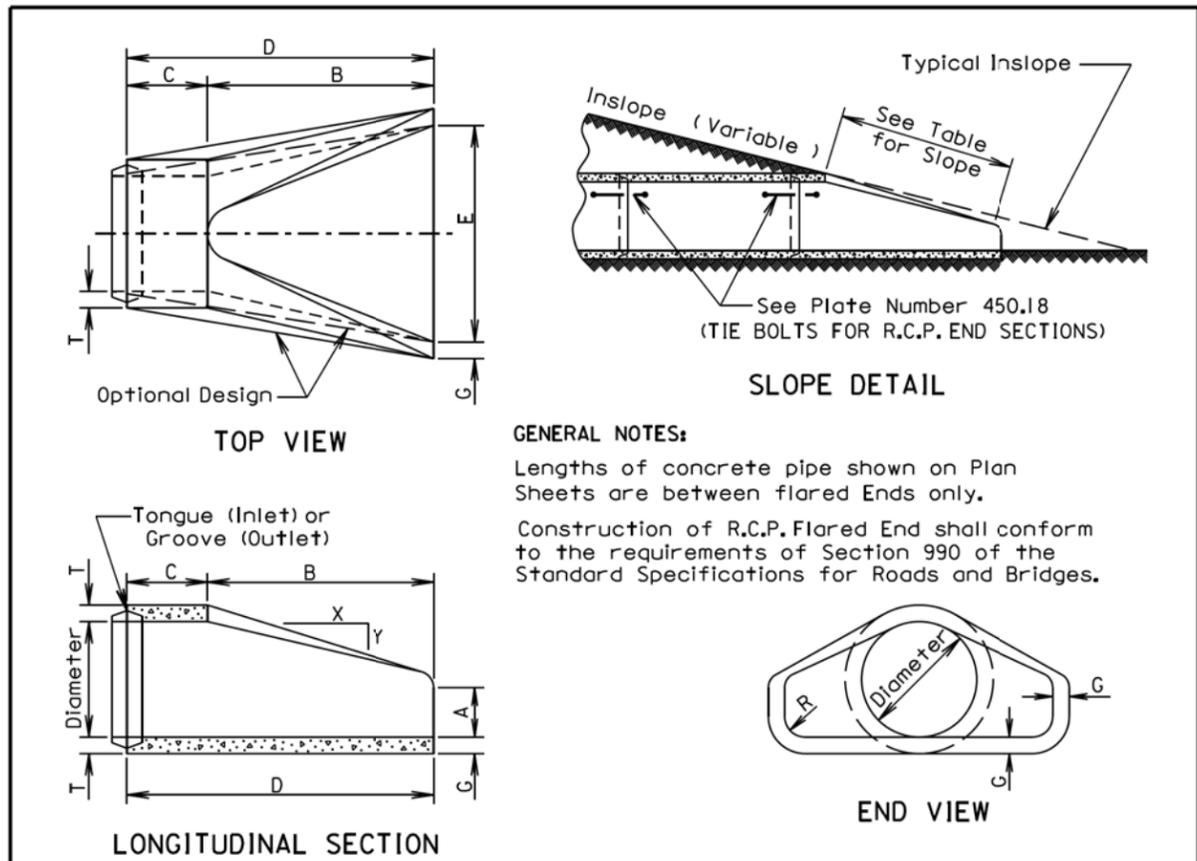
FILE - ... \STD PLATES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

PLOT SCALE - 1:200

PLOT NAME - 3

FILE - ... \STD PLATES 0367 & 04WB.DGN

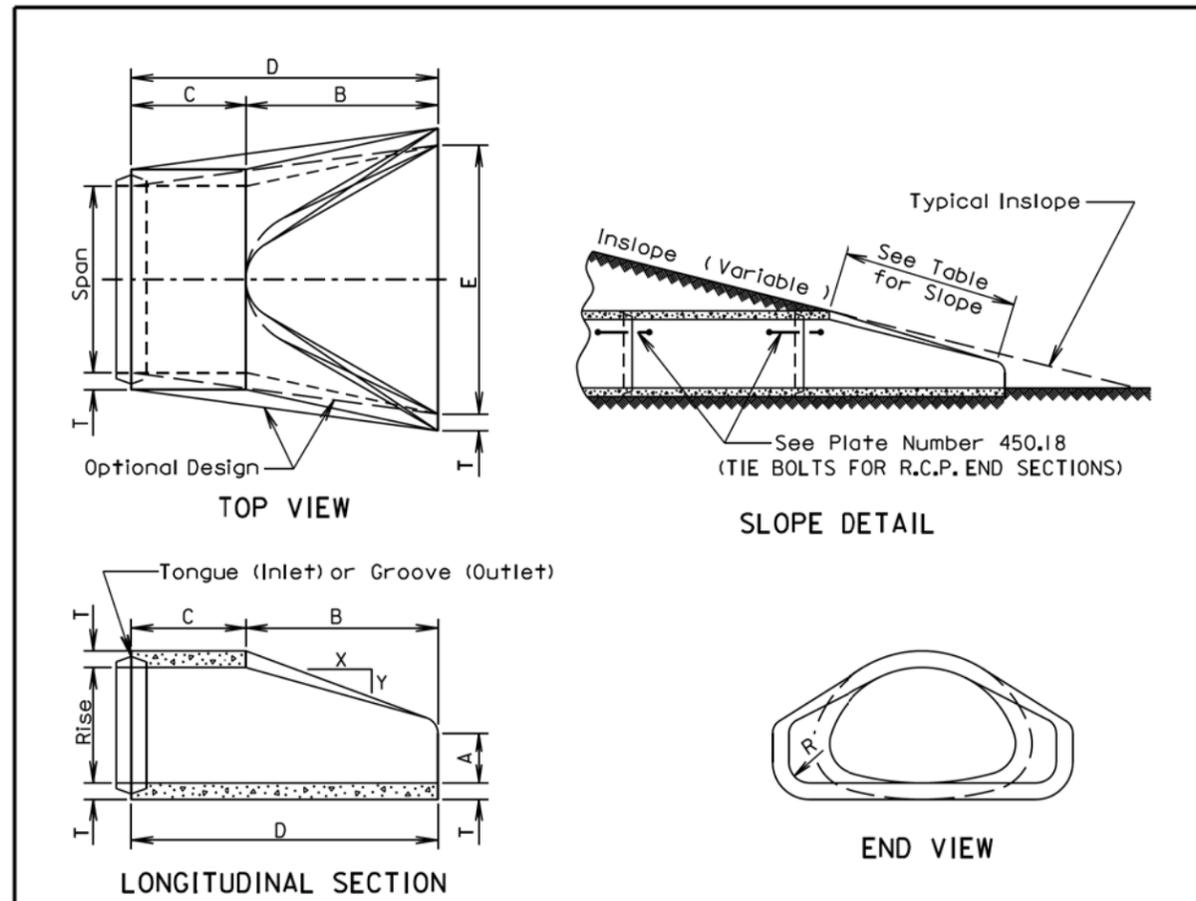


**GENERAL NOTES:**  
 Lengths of concrete pipe shown on Plan Sheets are between flared Ends only.  
 Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48 1/8	72 7/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5:1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5:1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5:1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5:1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5:1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5:1	5	24	72	26	98	84	5	1 1/2
54	8240	2:1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9:1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7:1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8:1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8:1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6:1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5:1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

March 31, 2000

<b>S D D O T</b>	<b>R. C. P. FLARED ENDS</b>	PLATE NUMBER <b>450.10</b>
	Published Date: 1st Qtr. 2015	Sheet 1 of 1



**GENERAL NOTES:**  
 Lengths of concrete pipe shown on Plan Sheets are between Flared Ends only.  
 Construction of R.C.P. Arch Flared End shall conform to the requirements of Section 990 of the Standard Specifications for Roads and Bridges.

* Size (in.)	Approximate Weight of Section (lbs.)	Rise (in.)	Span (in.)	Slope (X:Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	R (in.)
18	1100	13 1/2	22	3:1	2 1/2	7	27	45	72	36	2
24	1750	18	28 1/2	3:1	3 1/2	8 1/2	39	33	72	48	3
30	3300	22 1/2	36 1/4	3:1	4	9 1/2	50	46	96	60	3
36	4350	26 5/8	43 3/4	3:1	4 1/2	11 1/8	60	36	96	72	6
42	5250	31 5/16	51 1/8	3:1	4 1/2	15 13/16	60	36	96	78	6
48	6400	36	58 1/2	3:1	5	21	60	36	96	84	6
54	7850	40	65	3:1	5 1/2	25 1/2	60	36	96	90	6
60	9500	45	73 1/2	3:1	6	31	60	36	96	96	6
72	13550	54	88	2:1	7	31	60	39	99	120	6
84	17950	62	102	2:1	8	28 1/2	83	19	102	144	6

\*Equivalent Diameter of Circular R. C. P.

March 31, 2000

<b>S D D O T</b>	<b>R. C. P. ARCH FLARED ENDS</b>	PLATE NUMBER <b>450.11</b>
	Published Date: 1st Qtr. 2015	Sheet 1 of 1

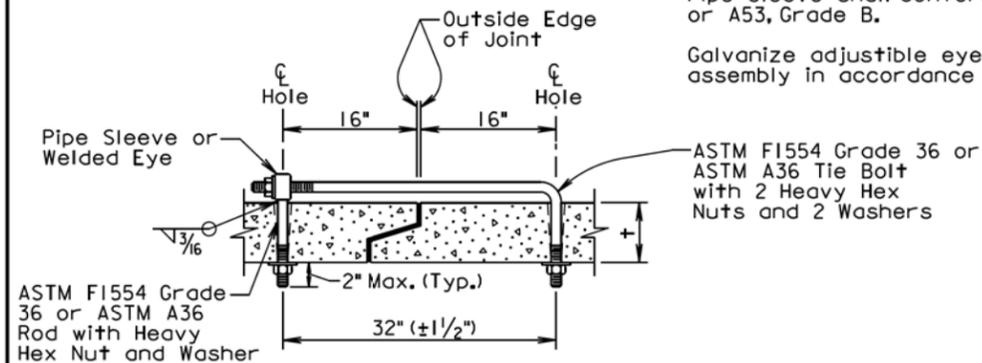
Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
$\leq 3/4$	$5/8$	$3/4$
$3/2 - 6/2$	$3/4$	1
$\geq 7$	1	$1 1/4$

**GENERAL NOTES:**

Tie bolts shall conform to ASTM F1554 Grade 36 or ASTM A36. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Pipe Sleeve shall conform to ASTM A500 or A53, Grade B.

Galvanize adjustable eye bolt tie assembly in accordance with ASTM A153.



**ADJUSTABLE EYE BOLT TIE**

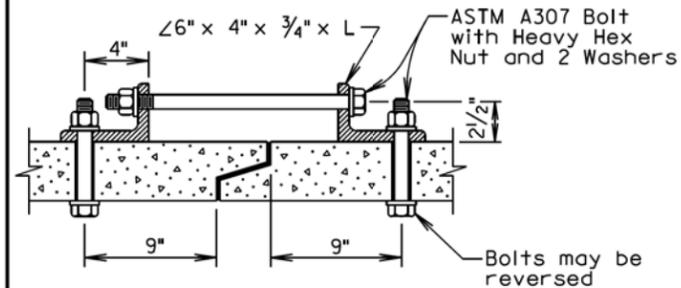
Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
$< 48$	4	$3/4$
$> 48$	6	1

**GENERAL NOTES:**

Angles shall conform to ASTM A36.

Bolts shall conform to ASTM A307. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.



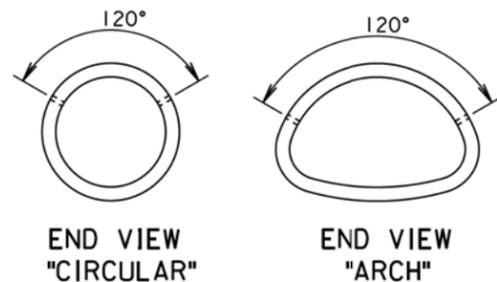
**ANGLE AND BOLT TIE**

**GENERAL NOTES:**

In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.

There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.



**END VIEW "CIRCULAR"**

**END VIEW "ARCH"**

February 28, 2013

Published Date: 1st Qtr. 2015

**S  
D  
D  
O  
T**

**TIE BOLTS FOR R.C.P. AND R.C.P. ARCH**

PLATE NUMBER  
450.18

Sheet 1 of 1

PLOT SCALE - 1:200

Plotting Date: 02/06/2015

**GENERAL NOTES:**

Either flanged channel steel posts or S3x5.7 steel I beam posts shall be used, but post type shall be consistent throughout the project. The S3x5.7 Steel I Beam post shall be used for the end posts.

All costs associated with furnishing and constructing the 3 cable guardrail anchor assembly including the concrete anchor, cable anchor bracket, compensating device, steel turnbuckle cable assembly, and necessary hardware shall be incidental to the contract unit price per each for "3 Cable Guardrail Anchor Assembly".

All costs associated with furnishing and constructing the 3 cable guardrail including posts, cable, cable splices, and hardware shall be incidental to the contract unit price per foot for "3 Cable Guardrail".

The following table and criteria shall apply to the arrangement of the Spring Cable End Assemblies (Compensation Devices) and Turnbuckle Cable End Assemblies:

LENGTH OF CABLE RUN	CRITERIA FOR ARRANGEMENT OF THE SPRING CABLE END ASSEMBLIES (COMPENSATION DEVICES) AND TURNBUCKLE CABLE END ASSEMBLIES
Less than 500'	Use turnbuckle on the approaching traffic end and compensating device on the other end of each individual cable, except in the W Beam to 3 Cable Transition where all compensating devices shall be provided at the bridge ends.
Greater than 500' to 1000'	Use compensating device on each end of each individual cable.
Greater than 1000'	Start new run by interlacing at last parallel post as shown on sheet 2 of 6.

All Compensating Devices shall be attached to the cable anchor bracket when one end of the run is attached to a bridge.

Compensating Devices must have a spring rate of 450 ± 50 pounds per inch and shall have a total available travel of 6 inches minimum.

The cable shall be retensioned after the initial 2 week pretension period in accordance with the following table:

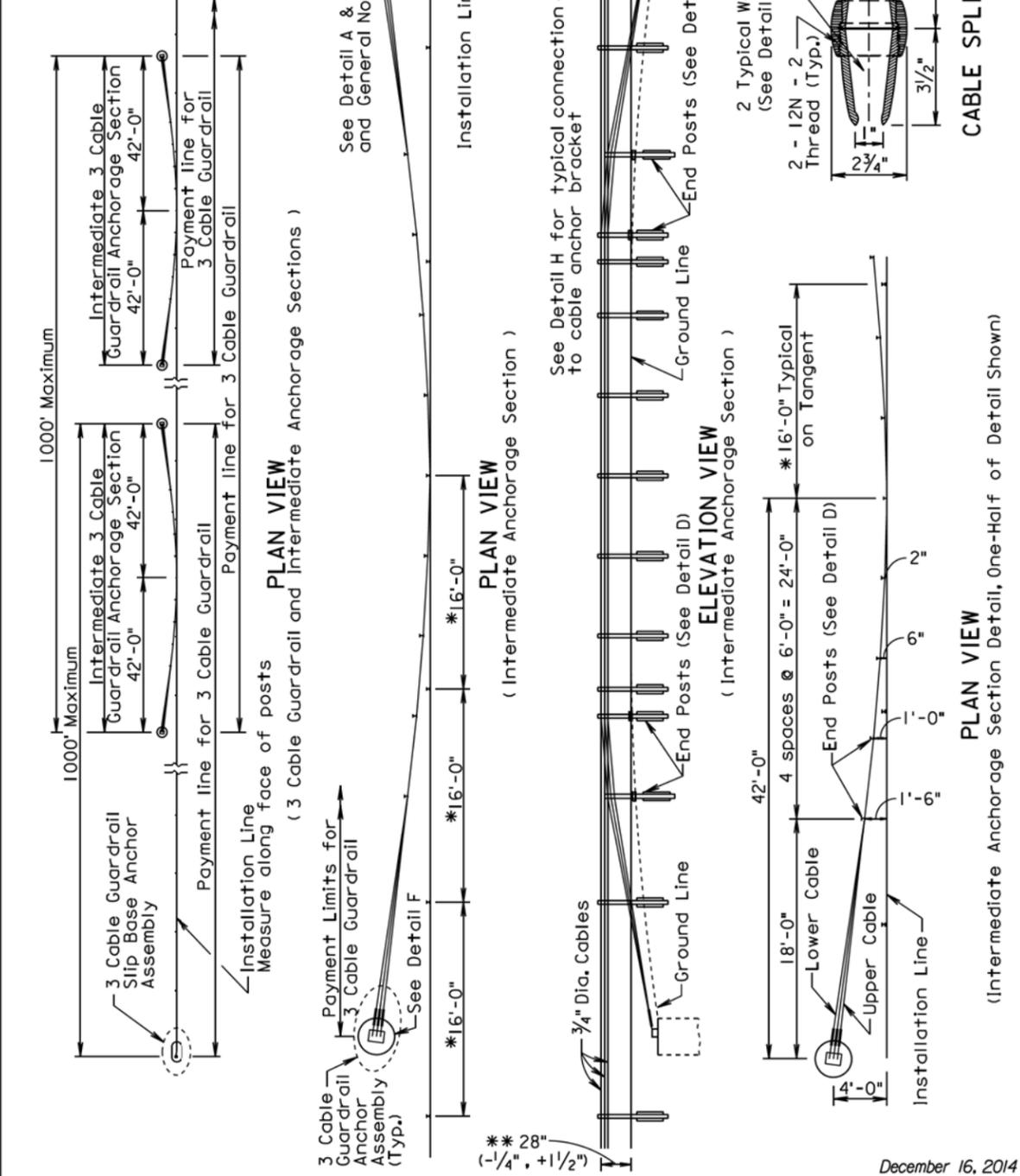
CABLE TENSIONING SPECIFICATIONS														
Temperature Range (Degree F)	-20 to -11	-10 to -1	0 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79	80 to 89	90 to 99	100 to 109	110 to 120
Spring Compression (Inch)	4 1/4	4	3 3/4	3 1/2	3 1/4	3	2 3/4	2 1/2	2 1/4	2	1 3/4	1 1/2	1 1/4	1

POST SPACING FOR HORIZONTAL CURVES	
Roadway $\frac{1}{4}$ Curvature	Maximum Post Spacing (Ft)
1° and Less	16'
Greater than 1° to 8°	12'
Greater than 8° to 13°	8'
Greater than 13°	NOT ALLOWED

December 16, 2014

<b>S D D O T</b>	<b>3 CABLE GUARDRAIL (LOW TENSION)</b>	PLATE NUMBER 629.01
		Sheet 1 of 6
		Published Date: 1st Qtr. 2015

\* See Table on Sheet 1 for post spacing on horizontal curves.  
 \*\* See Standard Plate 630.98



December 16, 2014

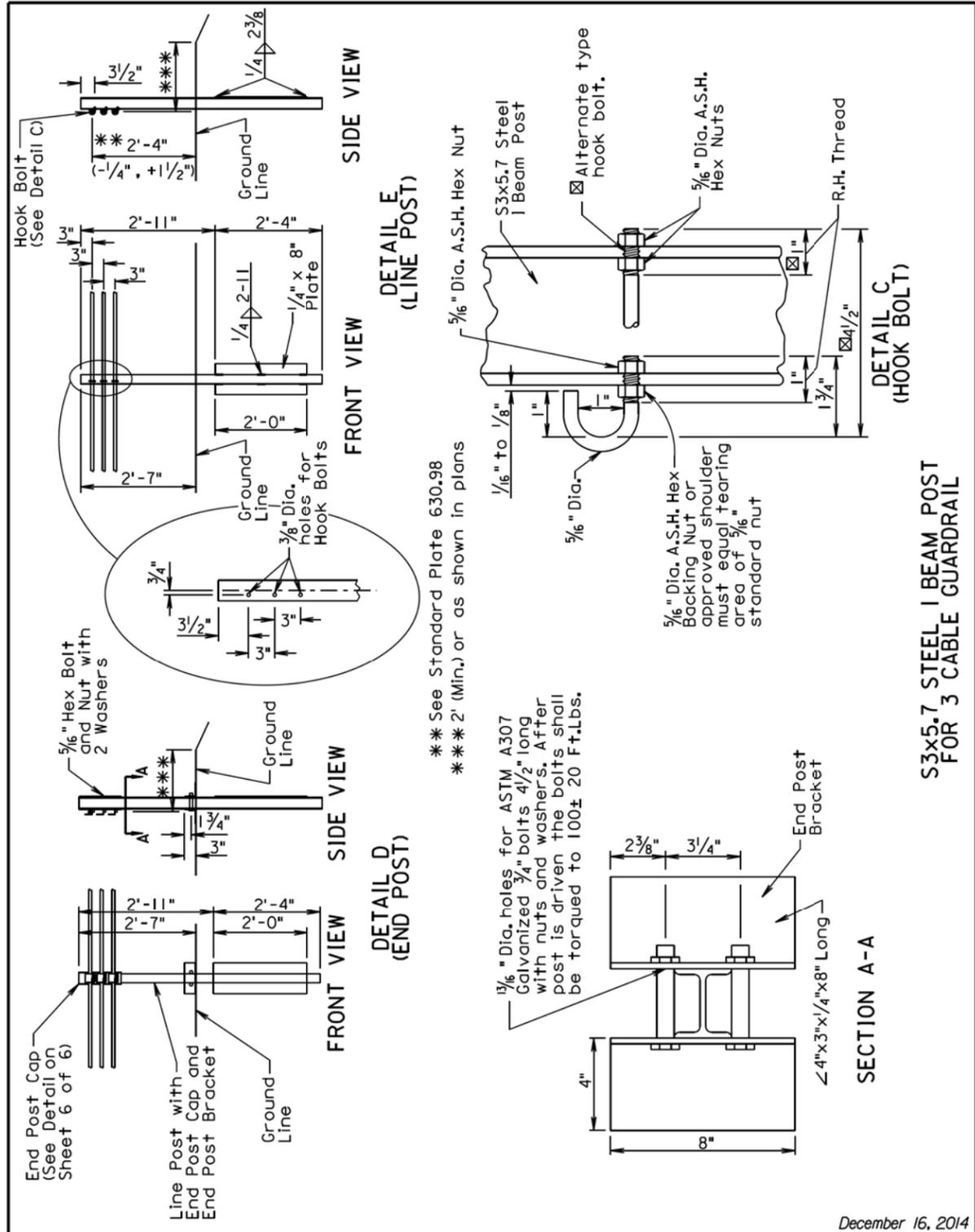
<b>S D D O T</b>	<b>3 CABLE GUARDRAIL (LOW TENSION)</b>	PLATE NUMBER 629.01
		Sheet 2 of 6
		Published Date: 1st Qtr. 2015

PLOTTED FROM - TRWJ1115

PLOT NAME - 5

FILE - ... \STD PLATES 0367 & 04WB.DGN



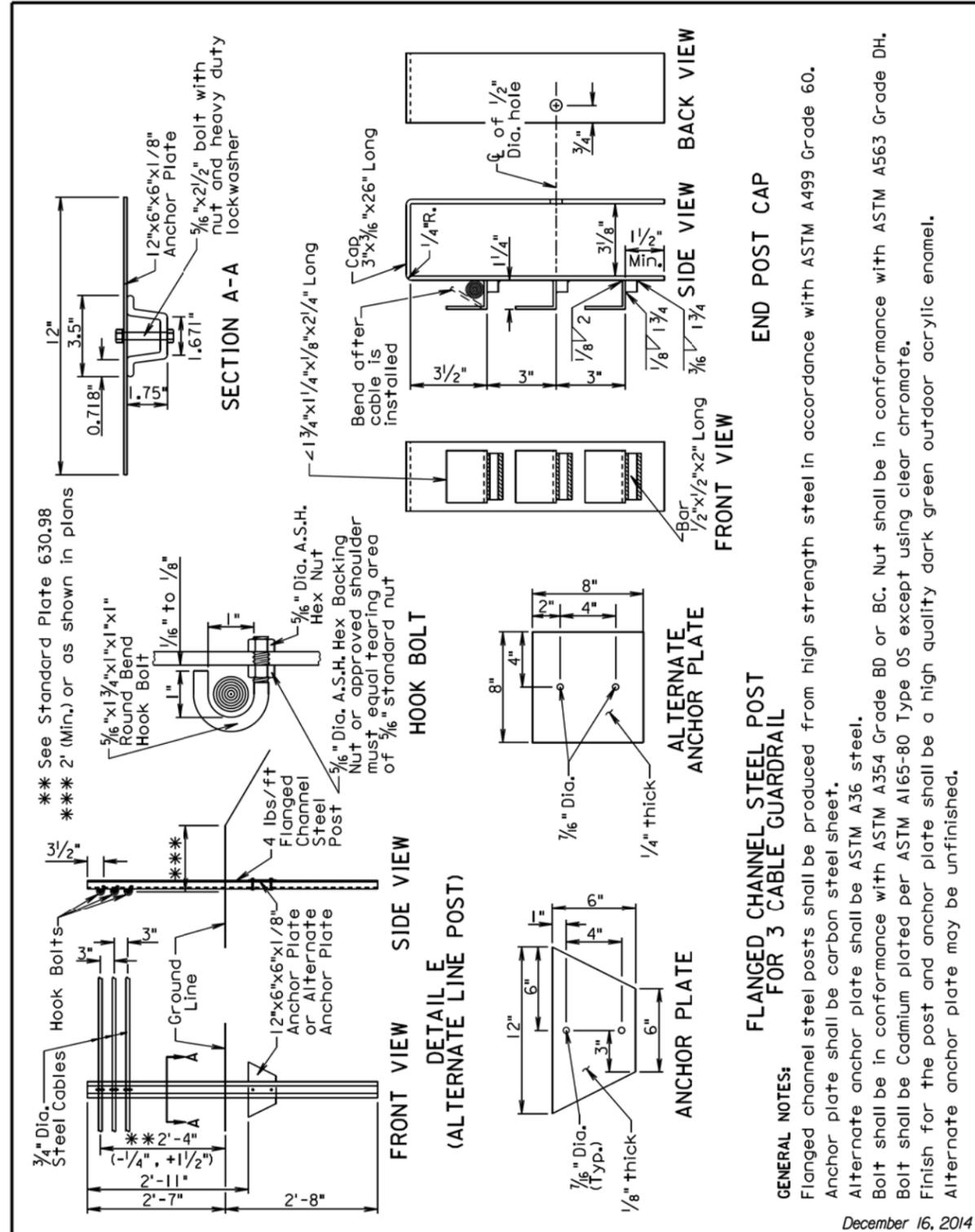


S3x5.7 STEEL I BEAM POST FOR 3 CABLE GUARDRAIL

December 16, 2014

S D D T	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER 629.01
		Sheet 5 of 6

Published Date: 1st Qtr. 2015



FLANGED CHANNEL STEEL POST FOR 3 CABLE GUARDRAIL

December 16, 2014

S D D T	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER 629.01
		Sheet 6 of 6

Published Date: 1st Qtr. 2015

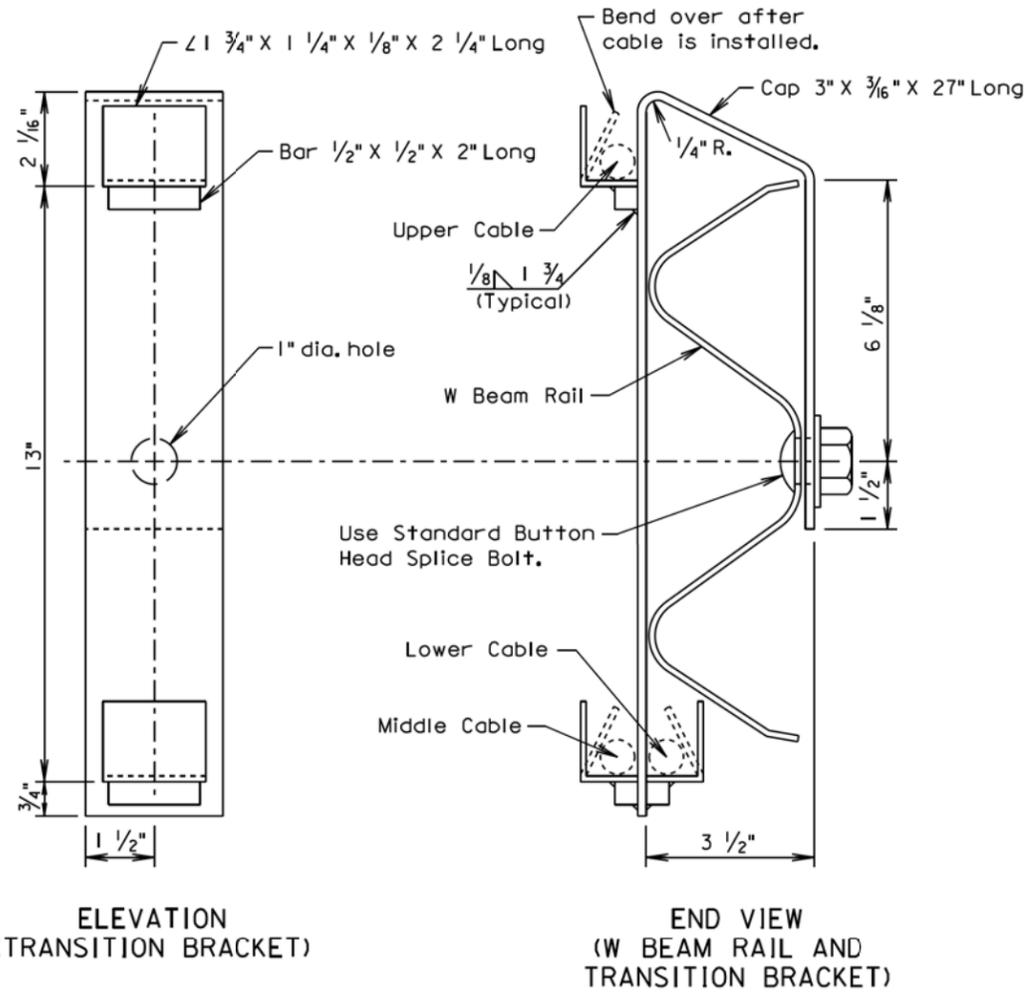
**GENERAL NOTES:**  
 Flanged channel steel posts shall be produced from high strength steel in accordance with ASTM A499 Grade 60. Anchor plate shall be carbon steel sheet.  
 Alternate anchor plate shall be ASTM A36 steel.  
 Bolt shall be in conformance with ASTM A354 Grade BD or BC. Nut shall be in conformance with ASTM A563 Grade DH. Bolt shall be Cadmium plated per ASTM A165-80 Type 0S 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
	NH 0281(110)105 NH 0281(109)145	63	75

Plotting Date: 02/06/2015



ELEVATION  
(TRANSITION BRACKET)

END VIEW  
(W BEAM RAIL AND  
TRANSITION BRACKET)

**GENERAL NOTES:**

Steel used in the fabrication of the bracket shall conform to ASTM A36 and the bracket shall be galvanized after fabrication in accordance with ASTM A123.

March 31, 2000

Published Date: 1st Qtr. 2015	S D D O T	PLATE NUMBER
		629.15
		Sheet 1 of 1

PLOT SCALE - 1:200

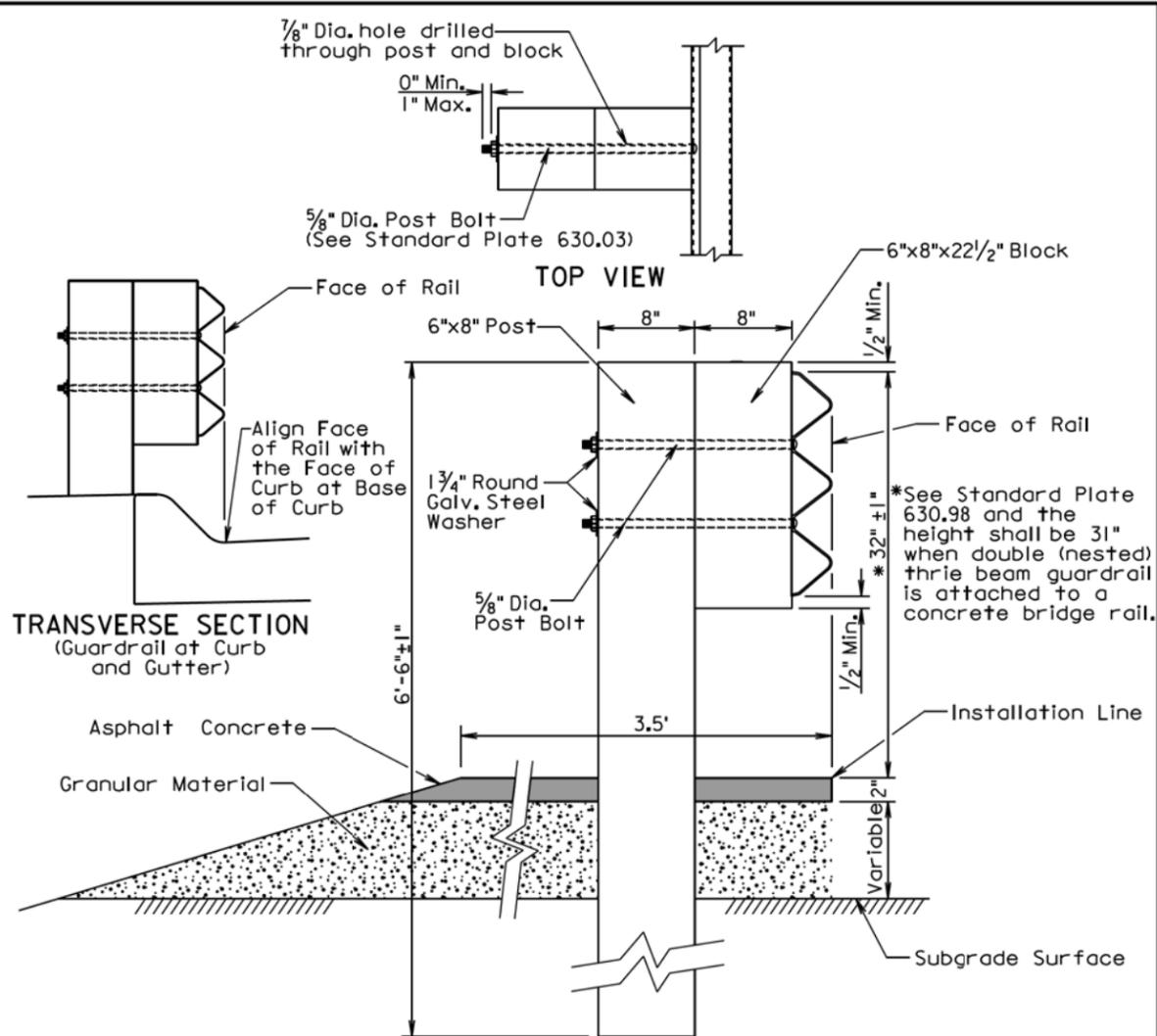
PLOTTED FROM - TRWJINT15

PLOT NAME - 10

FILE - ... \STD PLATES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

PLOT SCALE - 1:200



**GENERAL NOTES:**

Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the SD Standard Specifications for "Asphalt Concrete Composite." For informational purposes, the Rate of Materials for the 3.5' wide section of asphalt concrete as shown above shall be 4.80 Tons per Station.

Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the SD Standard Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.

Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "Thrie Beam Guardrail" bid item.

The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).

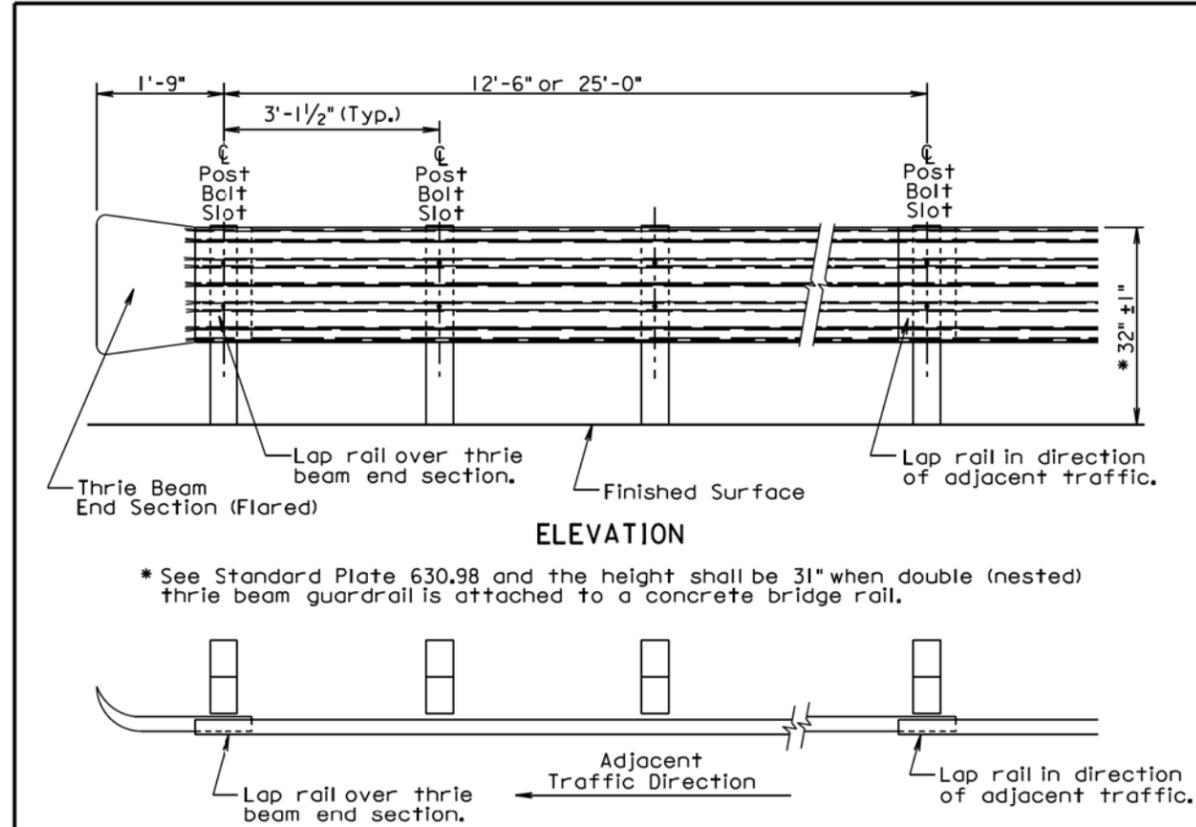
The top of posts and top of block shall have a true square cut. The top of post and top of block shall be flush.

December 23, 2010

<b>S D D O T</b>	<b>THRIE BEAM GUARDRAIL POST INSTALLATION</b>	PLATE NUMBER 630.01
		Sheet 1 of 1

Published Date: 1st Qtr. 2015

PLOTTED FROM - TRWJ11115



\* See Standard Plate 630.98 and the height shall be 31" when double (nested) thrie beam guardrail is attached to a concrete bridge rail.

THRIE BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	2'-6"
3'-1/2"	1'-9"

For Informational Purposes Only

**GENERAL NOTES:**

All thrie beam rail shall be Type I.

There will be no separate payment for furnishing and installing Thrie Beam End Sections (Flared) and Thrie Beam Terminal Connectors. All costs for the Thrie Beam End Sections (Flared) and Thrie Beam Terminal Connectors shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

Thrie beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

Thrie Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for Thrie Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

All costs for constructing thrie beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "Thrie Beam Guardrail" bid item.

December 23, 2010

<b>S D D O T</b>	<b>THRIE BEAM GUARDRAIL INSTALLATION</b>	PLATE NUMBER 630.02
		Sheet 1 of 1

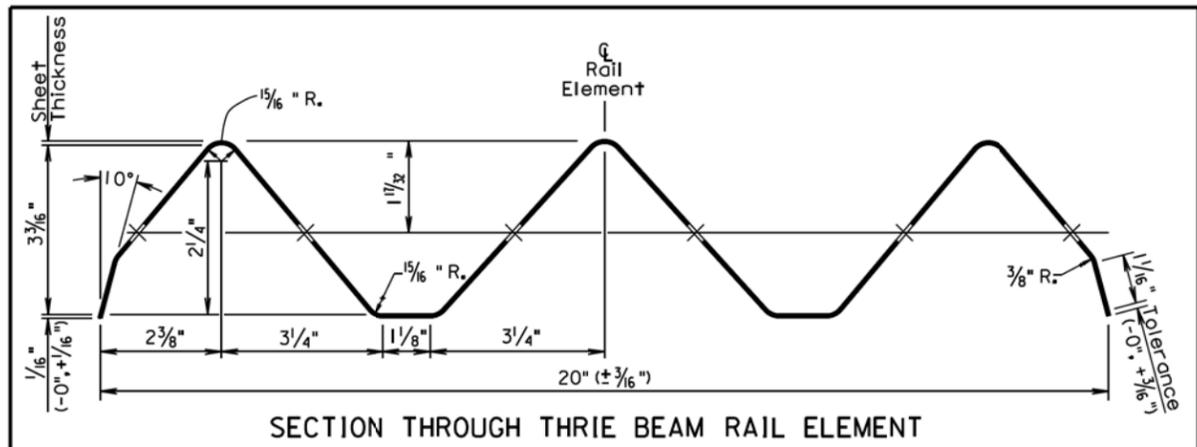
Published Date: 1st Qtr. 2015

PLOT NAME - 11

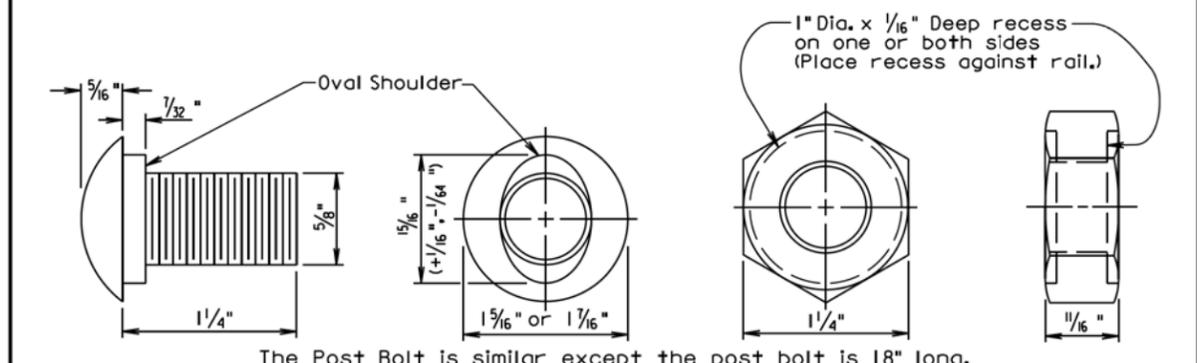
FILE - ... \STD PLATES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

PLOT SCALE - 1:200

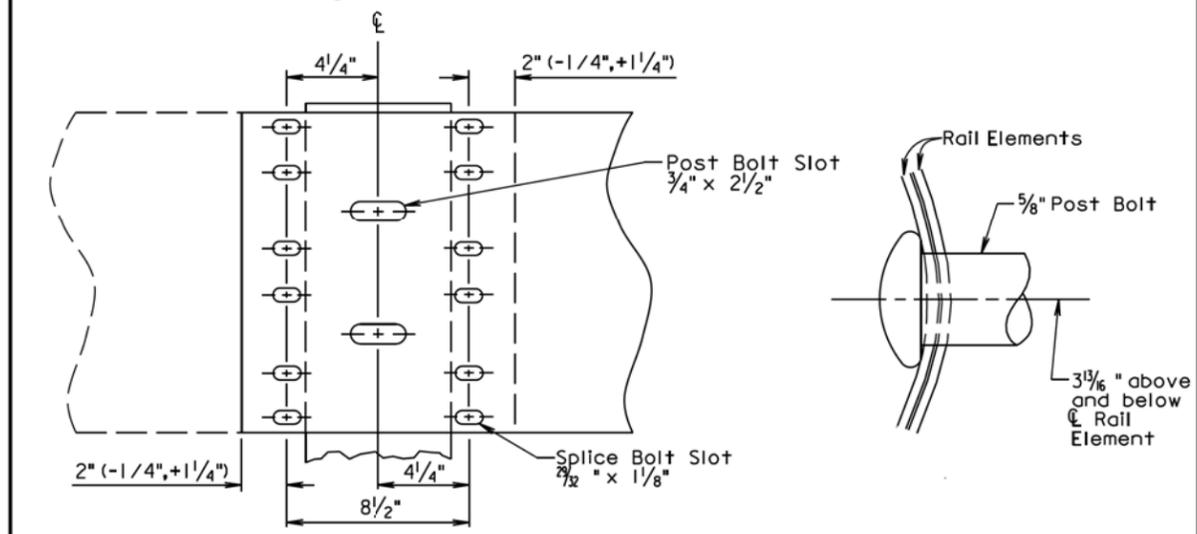


SECTION THROUGH THRIE BEAM RAIL ELEMENT



The Post Bolt is similar except the post bolt is 18" long.

SPLICE BOLT  
(5/8" BUTTON HEAD BOLT AND RECESS NUT)



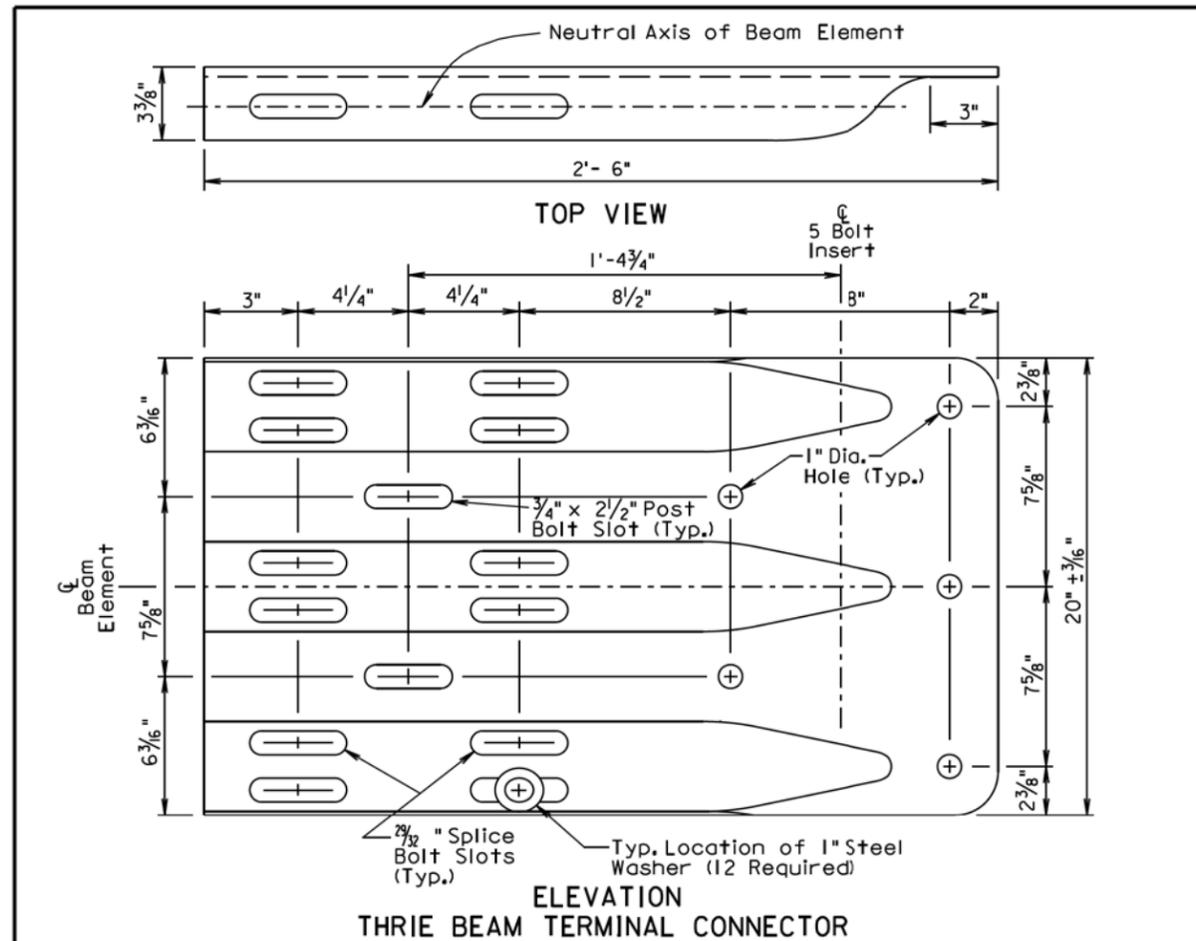
Lap in direction of traffic.

RAIL SPLICE

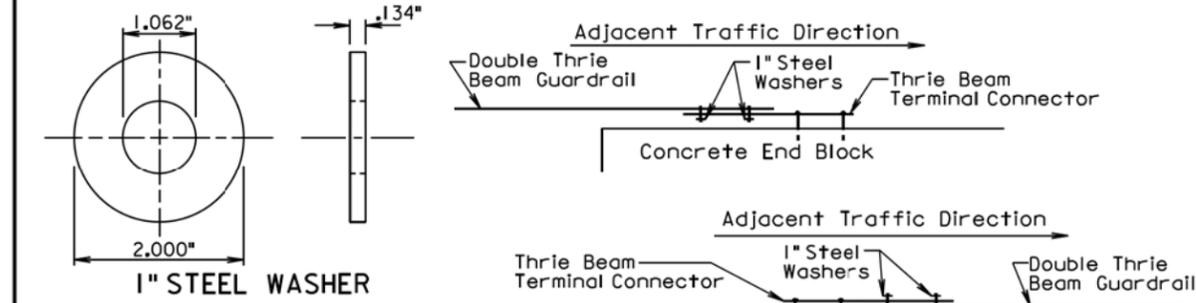
March 31, 2000

<b>S D D O T</b>	<b>THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE</b>	PLATE NUMBER <b>630.03</b>
		Sheet 1 of 1
		Published Date: 1st Qtr. 2015

PLOTTED FROM - TRW11N115



THRIE BEAM TERMINAL CONNECTOR



**GENERAL NOTES:**

- Thrie Beam Terminal Connectors shall be 10 gauge.
- When the thrie beam terminal connector is used to connect the rail to the bridge, 1" steel washers shall be used at the lap splice and the washers shall be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.
- There will be no separate payment for furnishing and installing the Thrie Beam Terminal Connector. All costs for the Thrie Beam Terminal Connector shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

September 14, 2001

<b>S D D O T</b>	<b>THRIE BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER</b>	PLATE NUMBER <b>630.05</b>
		Sheet 1 of 1
		Published Date: 1st Qtr. 2015

PLOT NAME - 12

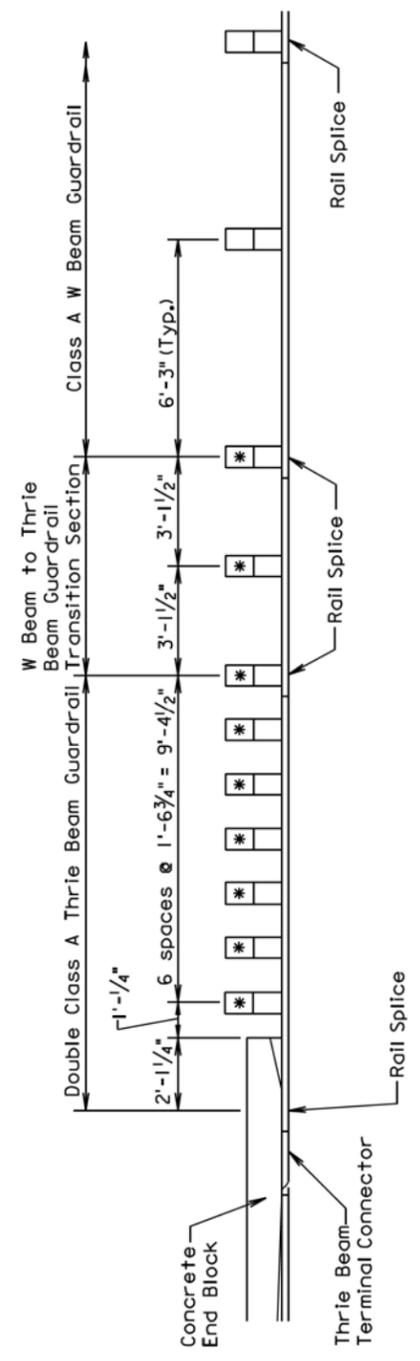
FILE - ... \STD PLATES 0367 & 04WB.DGN

PLOT SCALE - 1:200

PLOTTED FROM - TRWJINT15

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	66	75

Plotting Date: 02/06/2015



\* 6" x 8" x 7' posts shall be used at these locations.

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

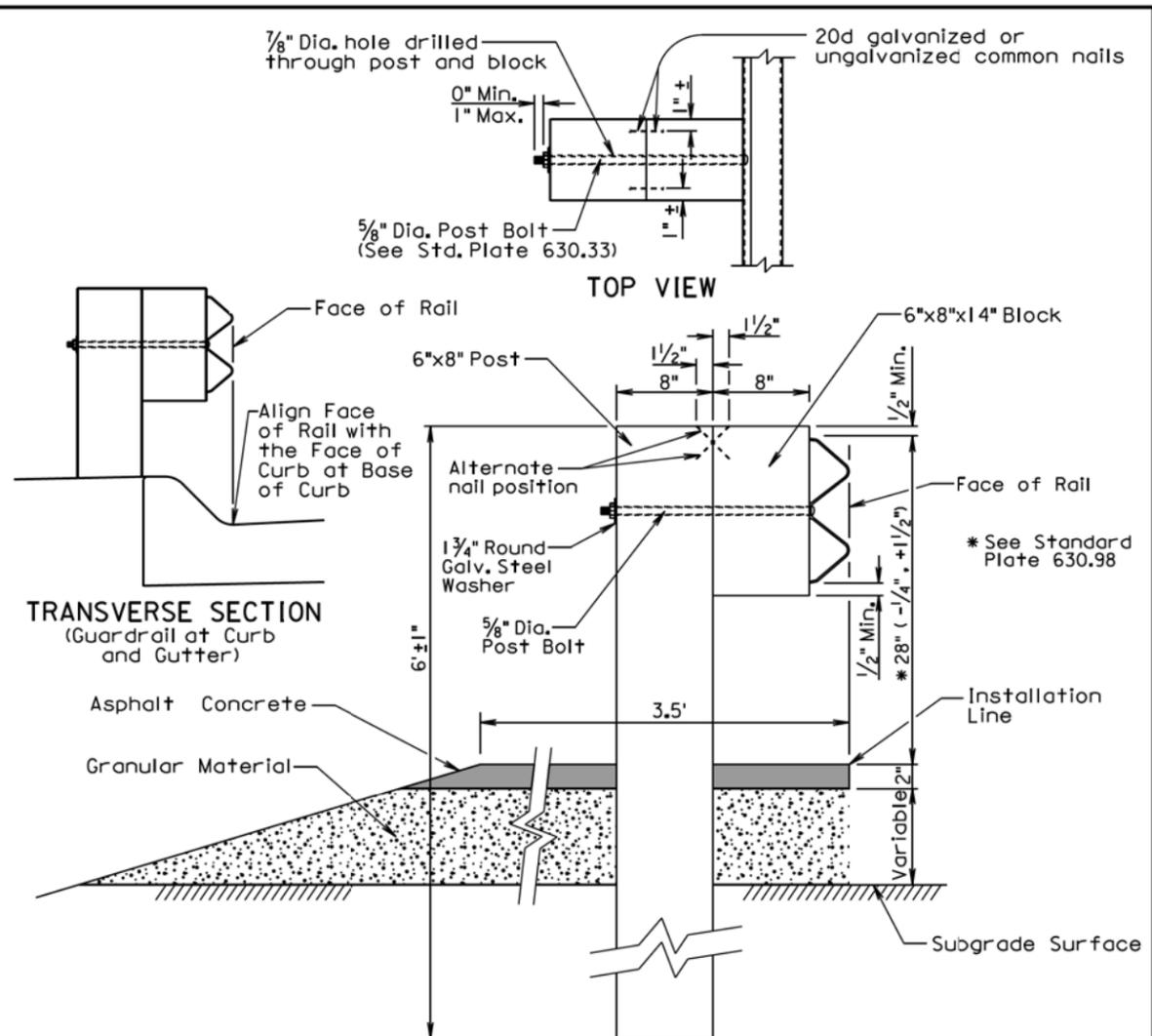
Published Date: 1st Qtr. 2015	S D D O T	POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END	PLATE NUMBER 630.15
			Sheet 1 of 1

PLOT NAME - 13

FILE - ... \STD PLATES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

PLOT SCALE - 1:200



**GENERAL NOTES:**

Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the SD Standard Specifications for "Asphalt Concrete Composite." For informational purposes, the Rate of Materials for the 3.5' wide section of asphalt concrete as shown above shall be 4.80 Tons per Station.

Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the SD Standard Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.

Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).

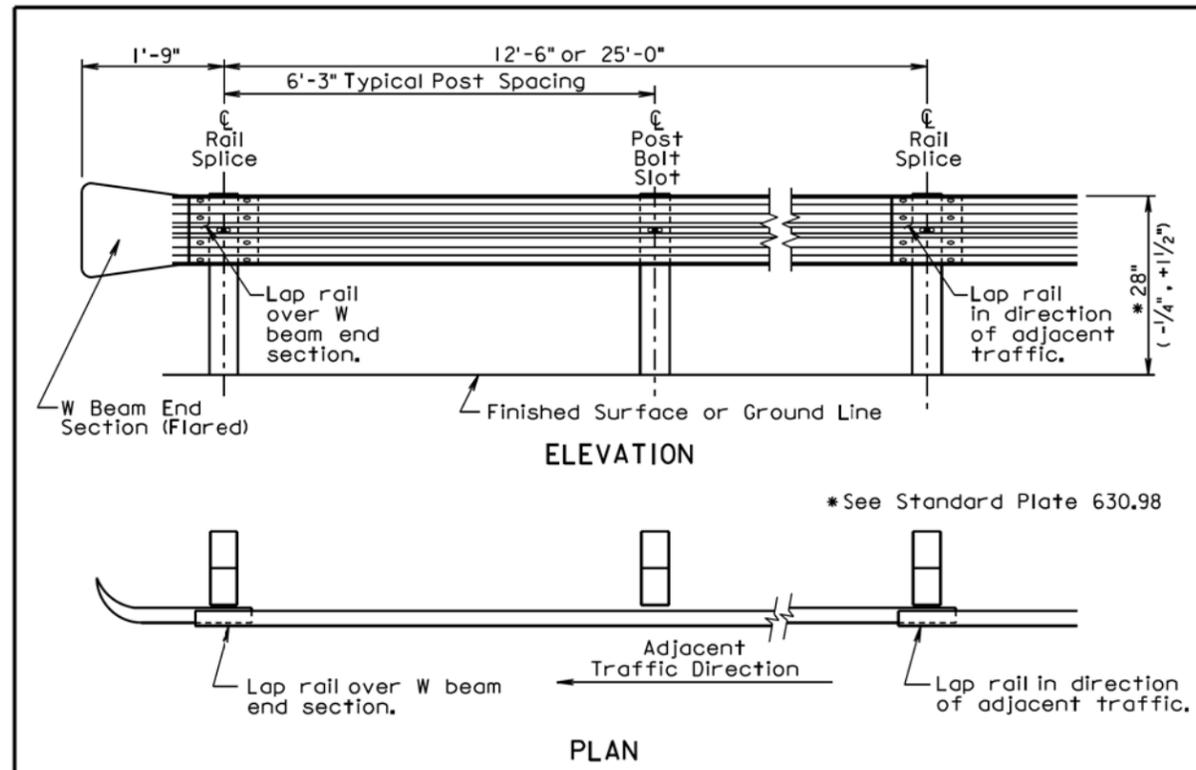
The top of posts and top of block shall have a true square cut. The top of post and top of block shall be flush.

December 23, 2010

<b>S D D O T</b>	<b>W BEAM GUARDRAIL POST INSTALLATION</b>	PLATE NUMBER 630.31
	Published Date: 1st Qtr. 2015	Sheet 1 of 1

PLOT NAME - 14

FILE - ... \STD PLATES 0367 & 04WB.DGN



W BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	5'-0"
3'-1 1/2"	3'-9"

For Informational Purposes Only

**GENERAL NOTES:**

All W beam rail shall be Type I.

There will be no separate payment for furnishing and installing W Beam End Sections (Flared) and W Beam Terminal Connectors. All costs for the W Beam End Sections (Flared) and W Beam Terminal Connectors shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

W Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for W Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

All costs for constructing W beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

December 16, 2014

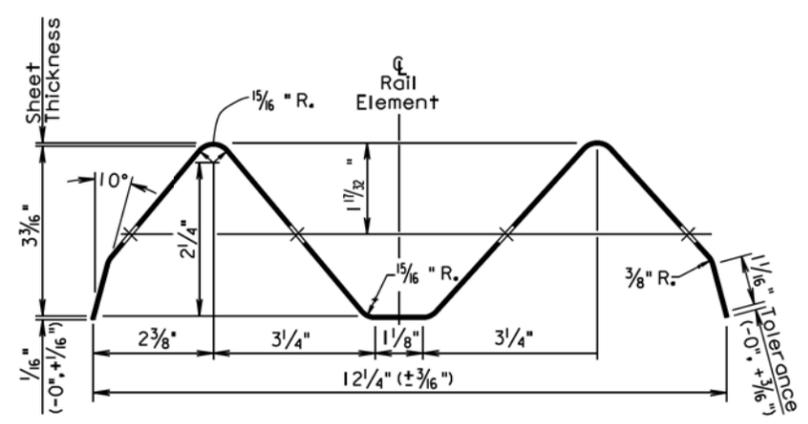
<b>S D D O T</b>	<b>W BEAM GUARDRAIL INSTALLATION</b>	PLATE NUMBER 630.32
	Published Date: 1st Qtr. 2015	Sheet 1 of 1

Plotting Date: 02/06/2015

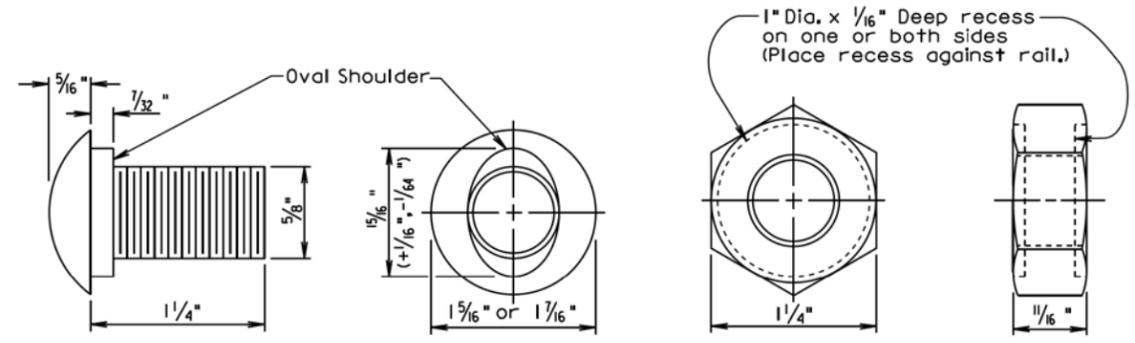
PLOT SCALE - 1:200

PLOT NAME - 15

FILE - ... \STD PLATES 0367 & 04WB.DGN

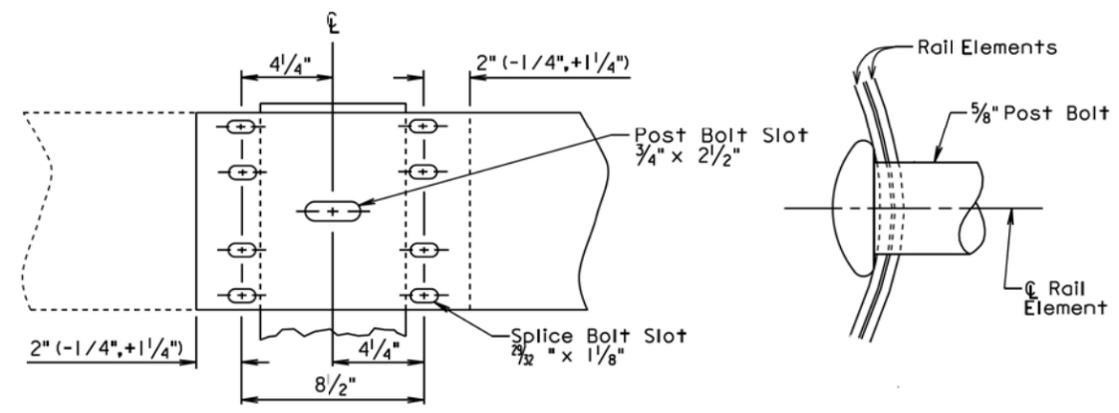


SECTION THROUGH W BEAM RAIL ELEMENT



The Post Bolt is similar except the post bolt is 18" long.

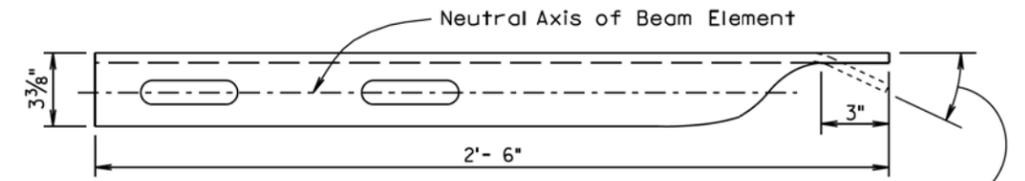
SPLICE BOLT  
(5/8" BUTTON HEAD BOLT AND RECESS NUT)



Lap in direction of traffic.  
RAIL SPLICE

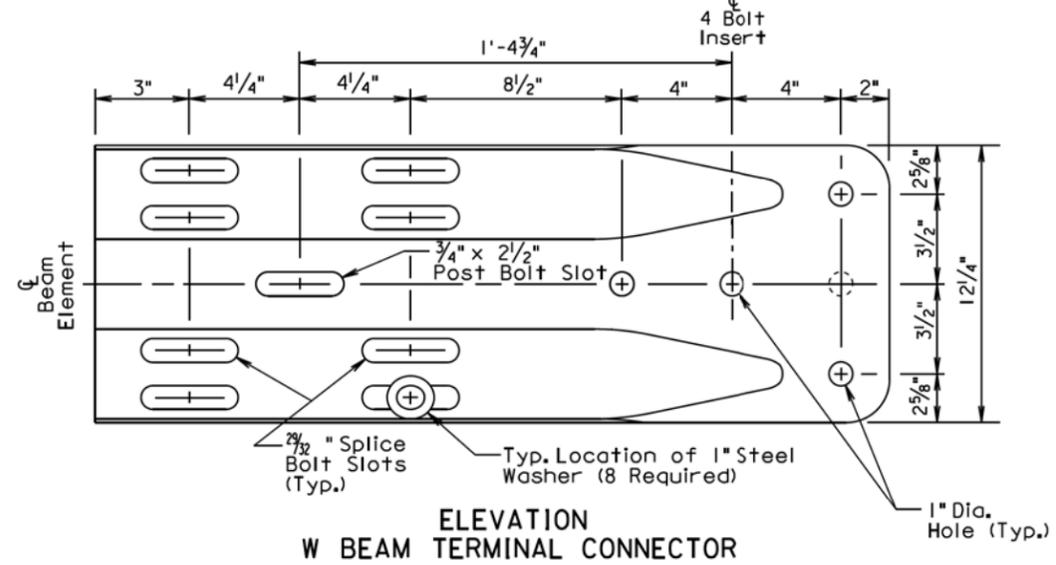
December 23, 2004

<b>S D D O T</b>	<b>W BEAM RAIL, RAIL SPLICE, AND HARDWARE</b>	PLATE NUMBER 630.33
		Sheet 1 of 1
		Published Date: 1st Qtr. 2015

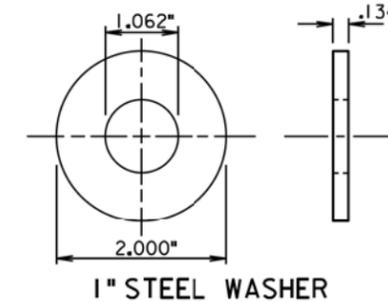


An extra hole and an approximate 26° bend shall be required only for the Breakaway Cable Terminal. The Modified W Beam Terminal Connector placement detail is shown on Standard Plate 630.47.

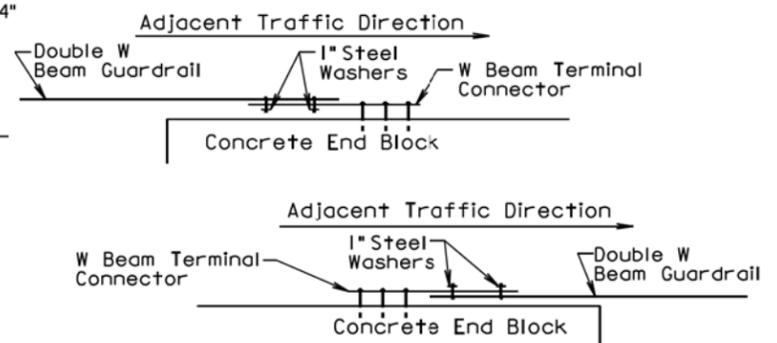
TOP VIEW



ELEVATION  
W BEAM TERMINAL CONNECTOR



1" STEEL WASHER



**GENERAL NOTES:**

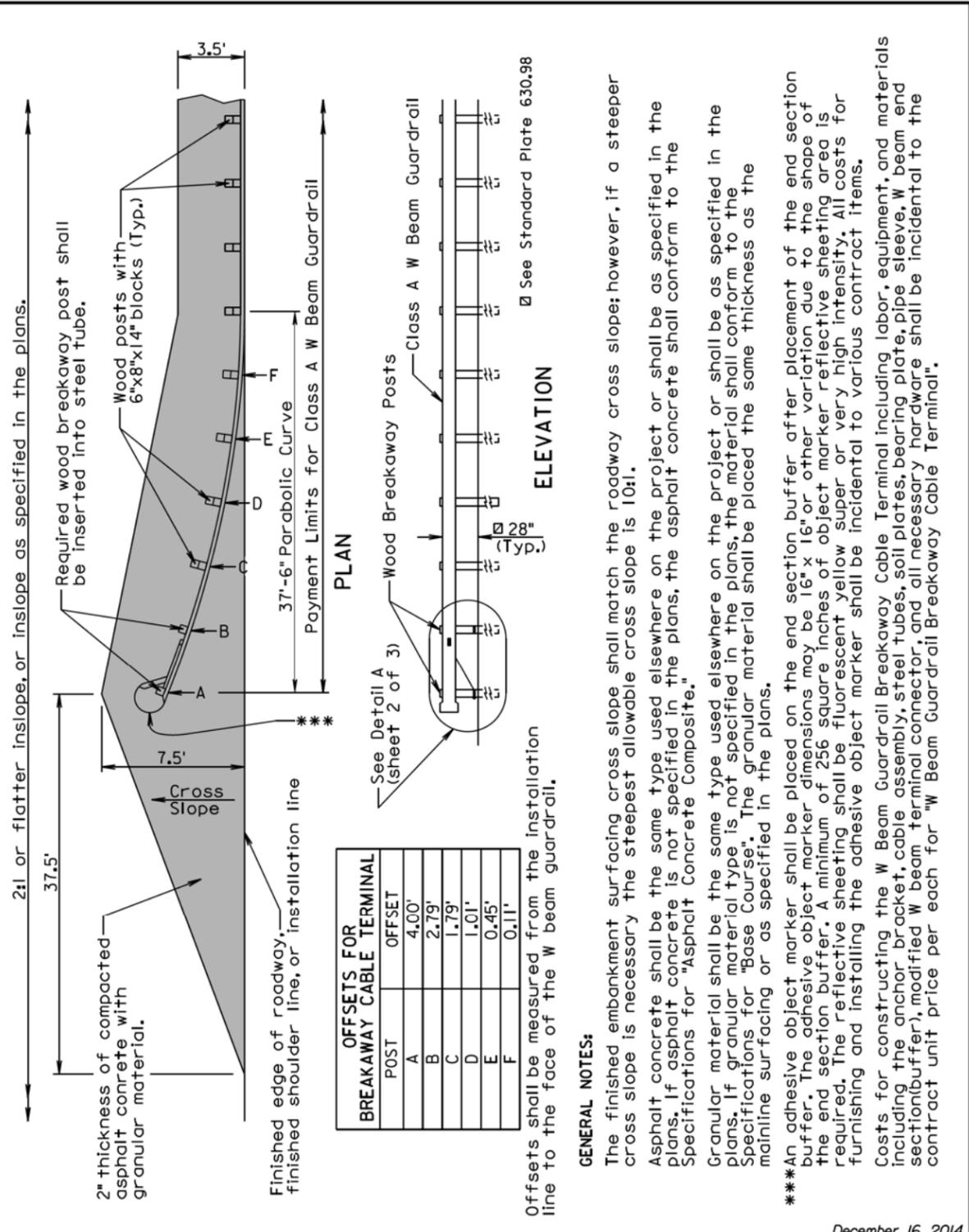
W Beam Terminal Connectors shall be 10 gauge.

When the W beam terminal connector is used to connect the rail to the bridge, 1" steel washers shall be used at the lap splice and the washers shall be in direct contact with the 3" slots of the W beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.

There will be no separate payment for furnishing and installing the W Beam Terminal Connector. All costs for the W Beam Terminal Connector shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

September 14, 2001

<b>S D D O T</b>	<b>W BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER</b>	PLATE NUMBER 630.35
		Sheet 1 of 1
		Published Date: 1st Qtr. 2015



POST	OFFSET
A	4.00'
B	2.79'
C	1.79'
D	1.01'
E	0.45'
F	0.11'

**GENERAL NOTES:**

The finished embankment surfacing cross slope shall match the roadway cross slope; however, if a steeper cross slope is necessary the steepest allowable cross slope is 10:1.

Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the Specifications for "Asphalt Concrete Composite."

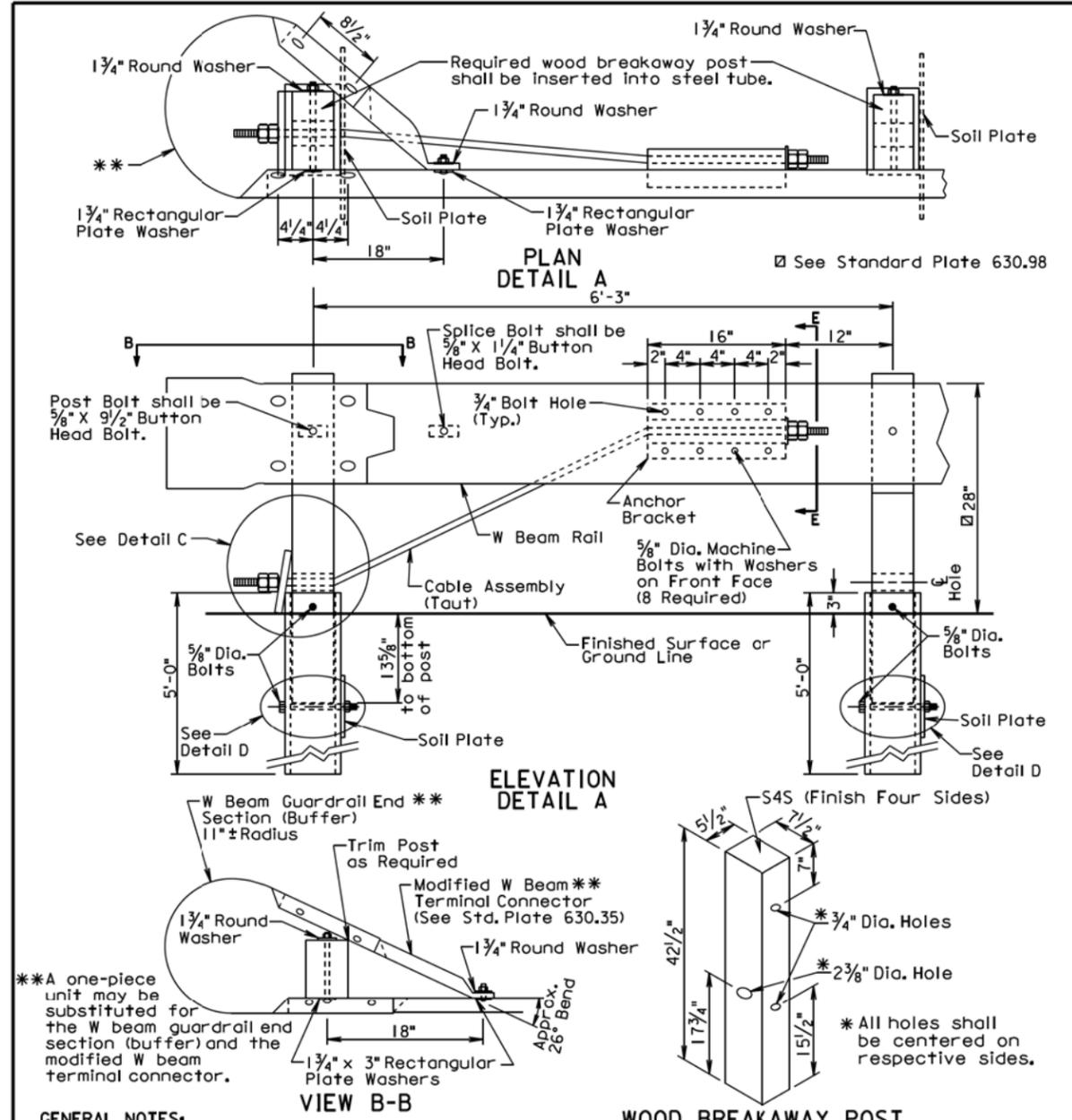
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.

\*\*An adhesive object marker shall be placed on the end section buffer after placement of the end section buffer. The adhesive object marker dimensions may be 16" x 16" or other variation due to the shape of the end section buffer. 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.

Costs for constructing the W Beam Guardrail Breakaway Cable Terminal including labor, equipment, and materials including the anchor bracket, cable assembly, steel tubes, soil plates, bearing plate, pipe sleeve, W beam end section (buffer), modified W beam terminal connector, and all necessary hardware shall be incidental to the contract unit price per each for "W Beam Guardrail Breakaway Cable Terminal".

December 16, 2014

<b>S D D O T</b>	<b>W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL</b>	PLATE NUMBER <b>630.47</b>
	Published Date: 1st Qtr. 2015	Sheet 1 of 3



**GENERAL NOTES:**

All hardware shall be galvanized in accordance with ASTM A153.

The steel tubes shall meet the requirements of ASTM Specification A500, Grade B, and shall be galvanized after fabrication in accordance with the requirements of AASHTO Specification M111.

The anchor bracket, soil plate, and bearing plate shall be fabricated from steel that meets ASTM A36 Specifications. They shall be galvanized after fabrication in accordance with ASTM A123.

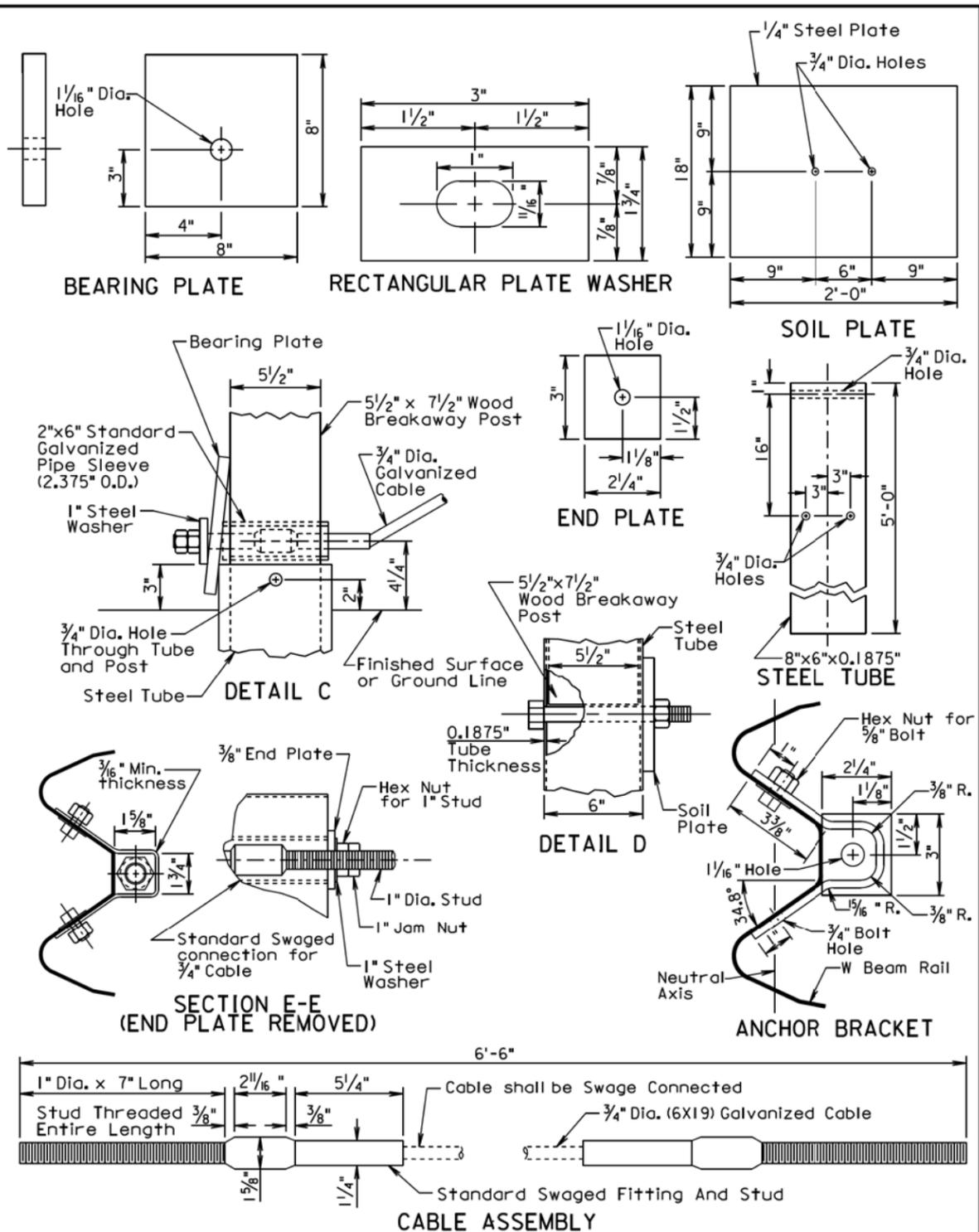
The W Beam End Section (Buffer) shall be 12 gage galvanized steel.

The cable shall be 3/4", Type II, with Class A coating in conformance with AASHTO M30.

December 16, 2014

<b>S D D O T</b>	<b>W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL</b>	PLATE NUMBER <b>630.47</b>
	Published Date: 1st Qtr. 2015	Sheet 2 of 3

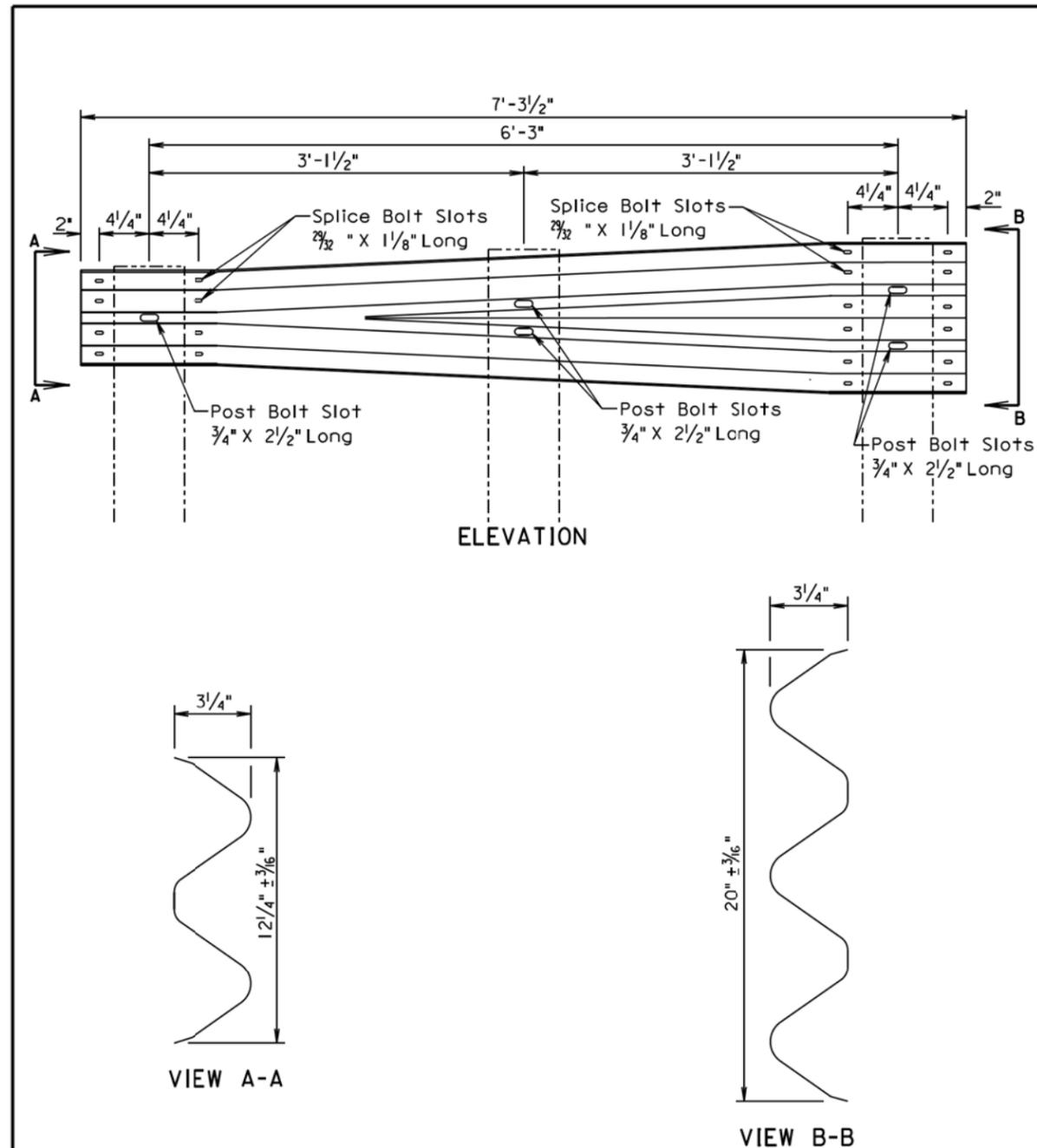
Plotting Date: 02/06/2015



December 16, 2014

S D D O T	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.47
		Sheet 3 of 3

Published Date: 1st Qtr. 2015



**GENERAL NOTE:**

All costs for constructing the W Beam to Thrie Beam Guardrail Transition including labor, equipment, and materials including two posts, two blocks, W beam to thrie beam transition section, and hardware shall be incidental to the contract unit price per each for "W Beam to Thrie Beam Guardrail Transition".

March 31, 2000

S D D O T	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.82
		Sheet 1 of 1

Published Date: 1st Qtr. 2015

PLOTTED FROM - 1.2000

PLOTTED FROM - TRW11115

PLOT NAME - 17

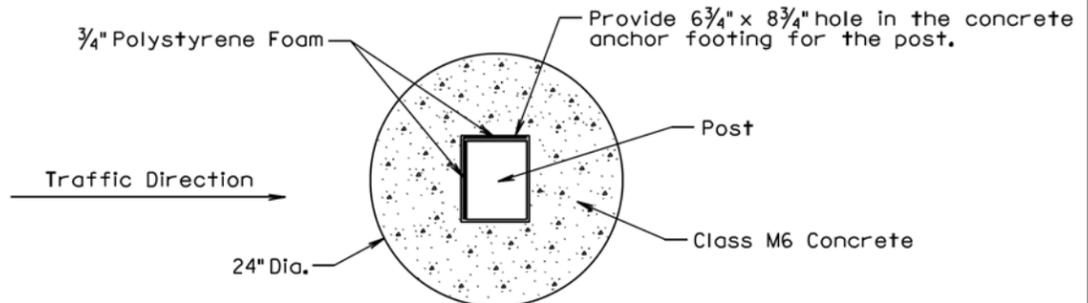
FILE - ... \STD PLATES 0367 & 04WB.DGN

Plotting Date: 02/06/2015

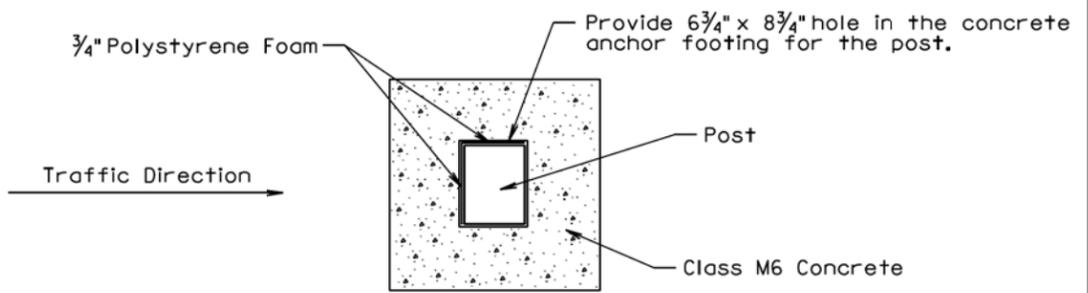
PLOT SCALE - 1:200

PLOT NAME - 18

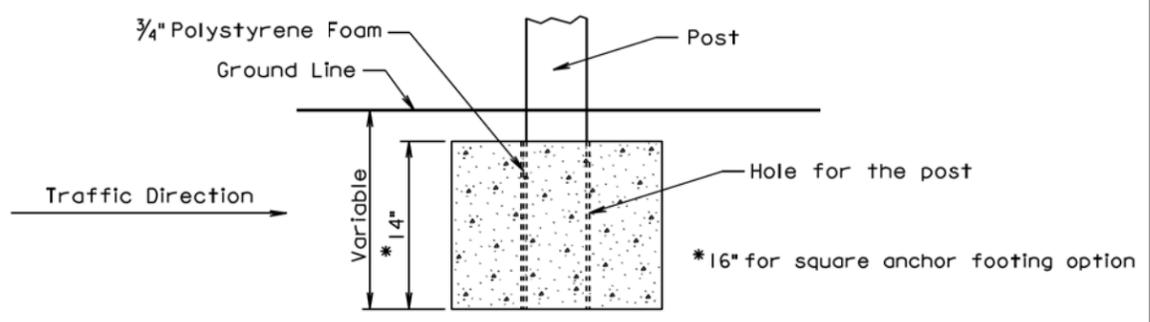
FILE - ... \STD PLATES 0367 & 04WB.DGN



PLAN  
(PREFERRED 24" DIA. ROUND  
CONCRETE ANCHOR FOOTING)



PLAN  
(20" x 20" SQUARE  
CONCRETE ANCHOR FOOTING)



ELEVATION

**GENERAL NOTES:**

In areas where the required guardrail wood post depth is not obtainable, shorter posts may be used and shall be anchored in concrete in accordance with the details shown on this standard plate.

A 20" x 20" square concrete anchor footing may be used in lieu of the 24" diameter round anchor footing.

Forms for the concrete anchor footing hole is not required.

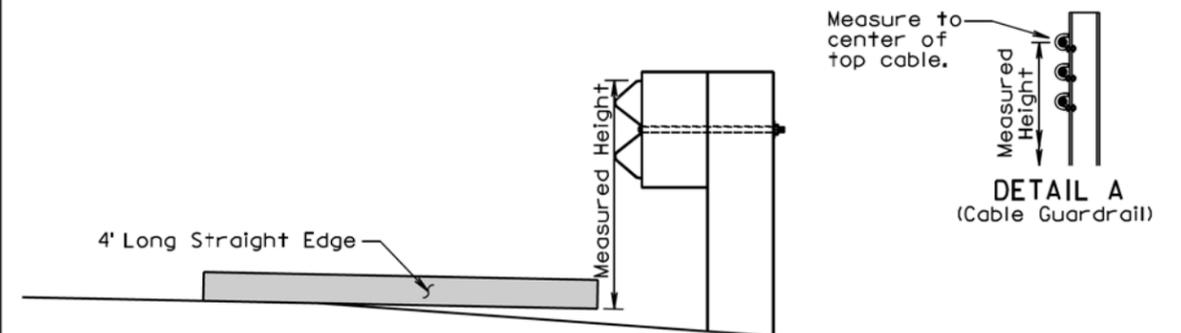
Concrete for the concrete anchor footing shall be Class M6.

Three quarter inch polystyrene foam shall be attached to two sides of the posts. See details above for placement position of the polystyrene foam.

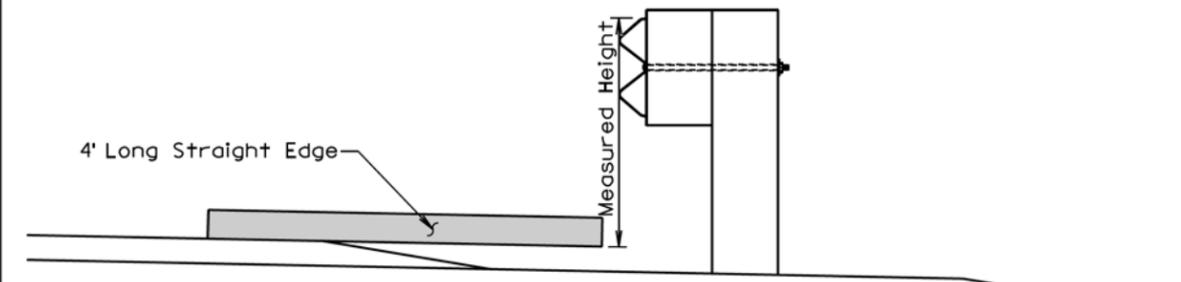
There will be no separate payment for furnishing and installing the concrete anchor footing for short guardrail post. All costs for concrete anchor footings shall be incidental to the contract unit price per foot for the respective "Thrie Beam or W Beam Guardrail" bid item.

March 31, 2000

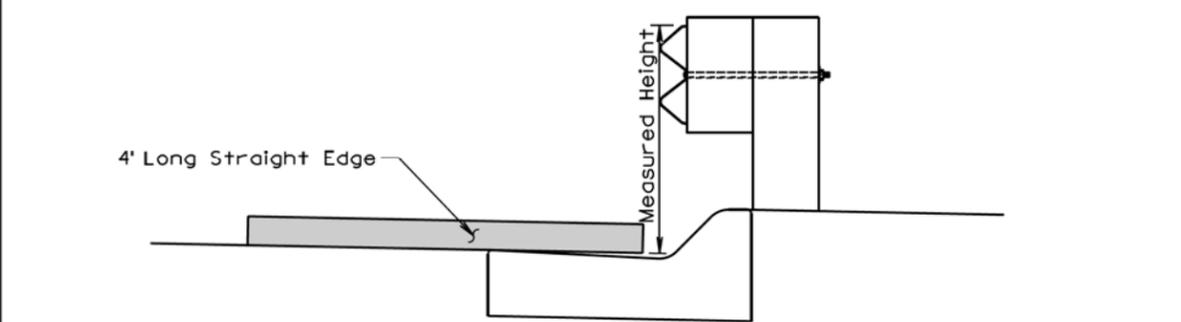
<b>S D D O T</b>	<b>CONCRETE ANCHOR FOOTING FOR SHORT GUARDRAIL POST</b>	PLATE NUMBER <b>630.84</b>
	<i>Published Date: 1st Qtr. 2015</i>	Sheet 1 of 1



ELEVATION VIEW  
(Guardrail Adjacent to Differential Slopes)



ELEVATION VIEW  
(Guardrail Adjacent to Differential Surfacing Elevations)



ELEVATION VIEW  
(Guardrail at Curb and Gutter)

**GENERAL NOTES:**

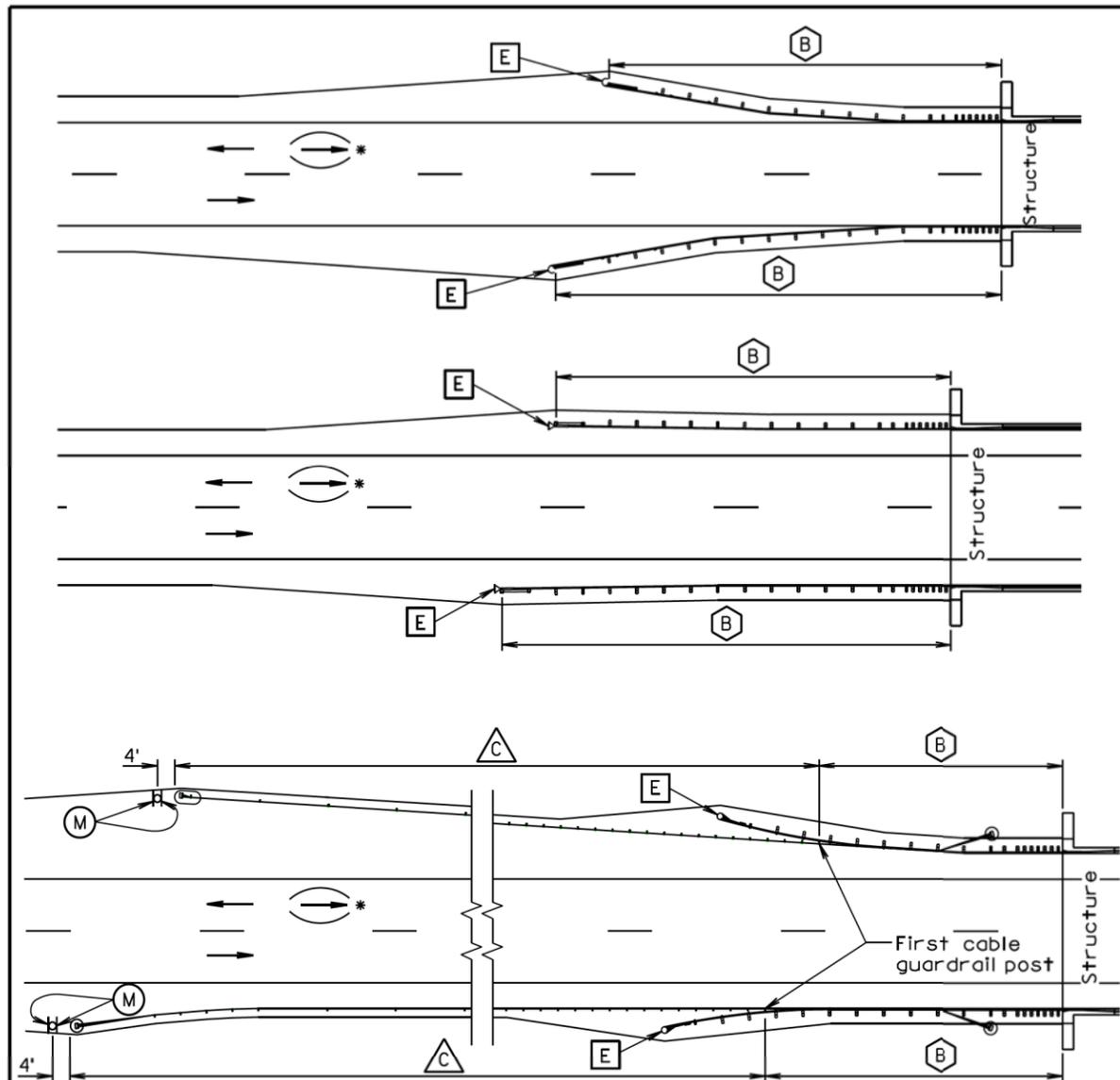
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems shall be measured in accordance with this standard plate.

When measuring height of cable guardrail or cable barrier the height shall be measured to the center of the top cable. See Detail A.

June 26, 2010

<b>S D D O T</b>	<b>MEASURING GUARDRAIL HEIGHT</b>	PLATE NUMBER <b>630.98</b>
	<i>Published Date: 1st Qtr. 2015</i>	Sheet 1 of 1

PLOT SCALE - 1:200



TYPICAL GUARDRAIL LAYOUTS

- Steel Beam Guardrail Delineation
- Guardrail Terminal End Object Marker
- 3 Cable Guardrail Delineation
- 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

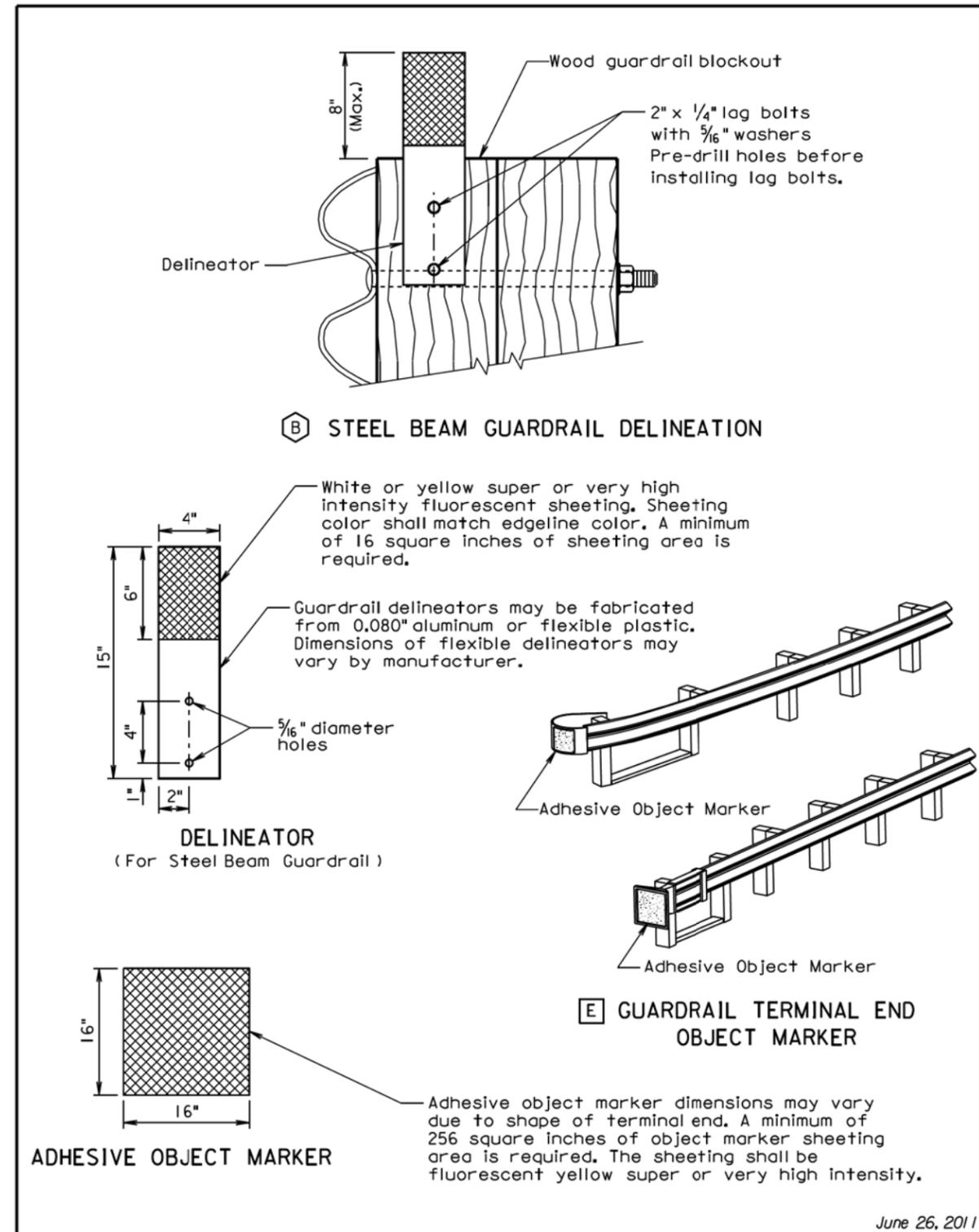
<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	PLATE NUMBER <b>632.40</b>
		Sheet 1 of 4

Published Date: 1st Qtr. 2015

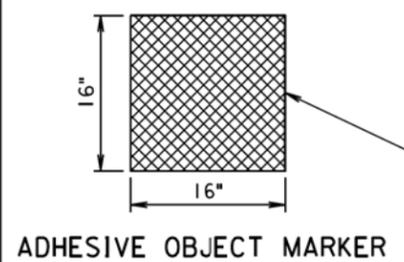
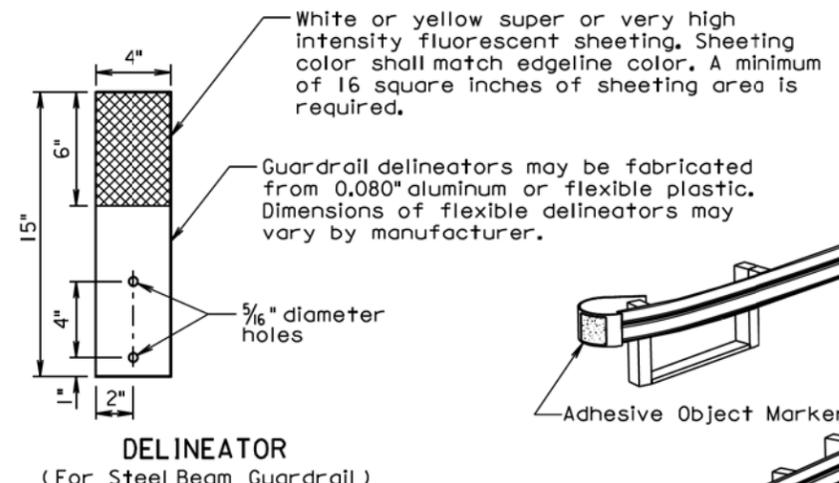
PLOT NAME - 19

FILE - ... \STD PLATES 0367 & 04WB.DGN

PLOTTED FROM - TRWJ11115



STEEL BEAM GUARDRAIL DELINEATION



**GUARDRAIL TERMINAL END OBJECT MARKER**

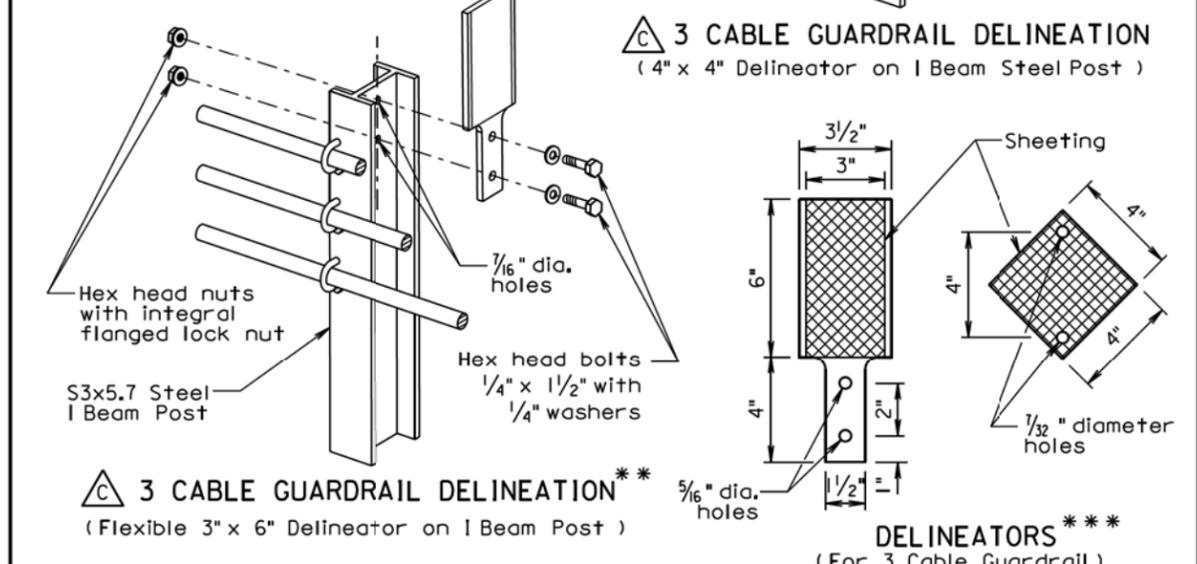
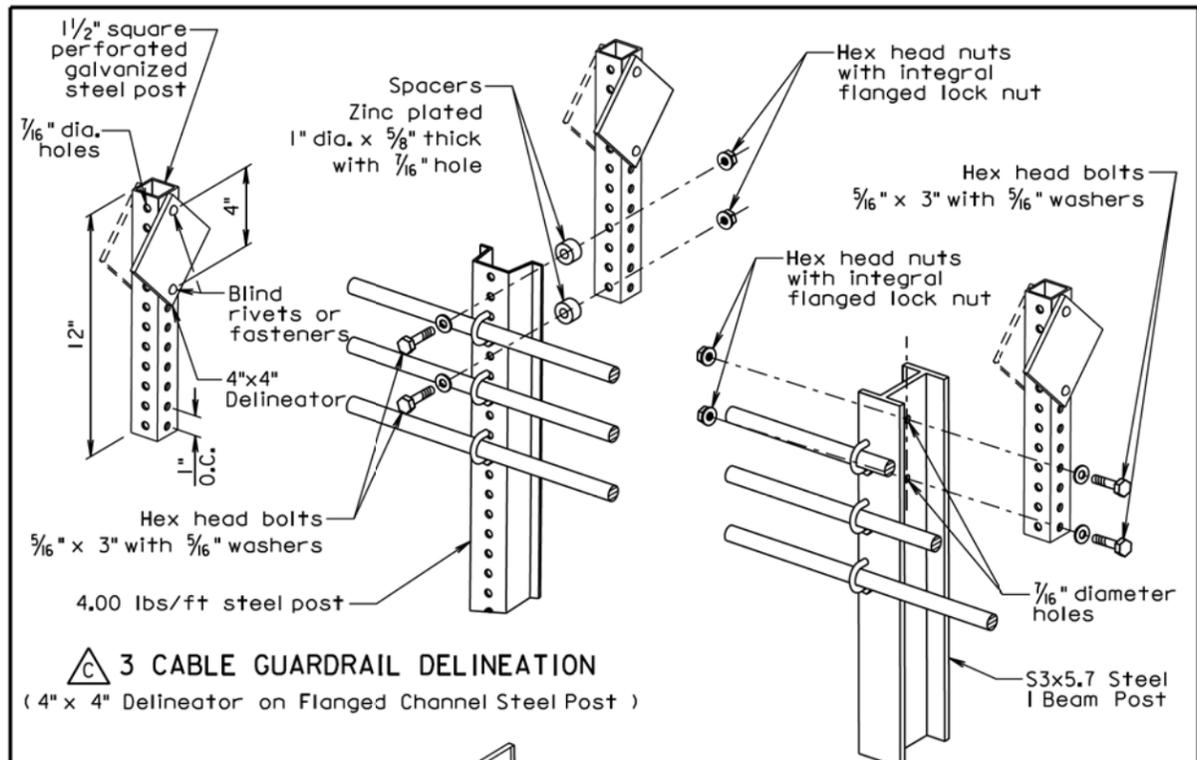
June 26, 2011

<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	PLATE NUMBER <b>632.40</b>
		Sheet 2 of 4

Published Date: 1st Qtr. 2015

Plotting Date: 02/06/2015

PLOT SCALE - 1:200



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

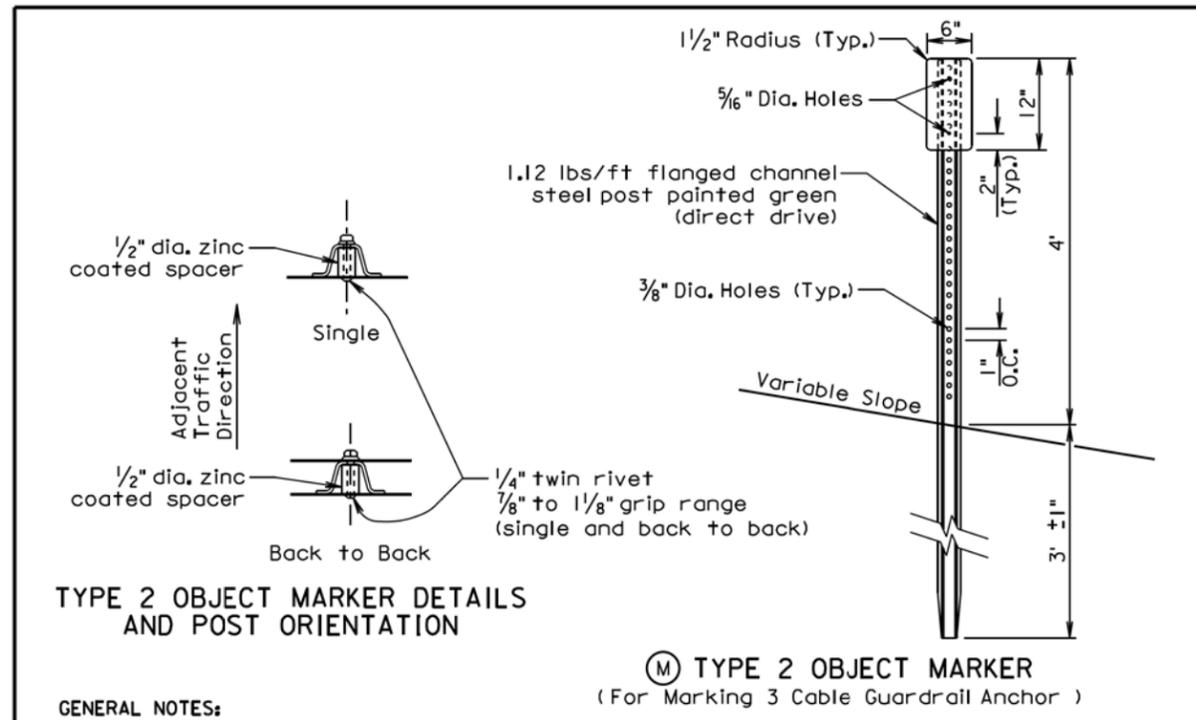
\*\*\* Dimensions of flexible delineators may vary by manufacturer. A minimum of 16 square inches of sheeting area is required. The sheeting shall be white or yellow super or very high intensity fluorescent sheeting. The sheeting color shall match the edgeline color.

June 26, 2011

<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	PLATE NUMBER <b>632.40</b>
		Sheet 3 of 4

Published Date: 1st Qtr. 2015

PLOTTED FROM - TRWJ11115



**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

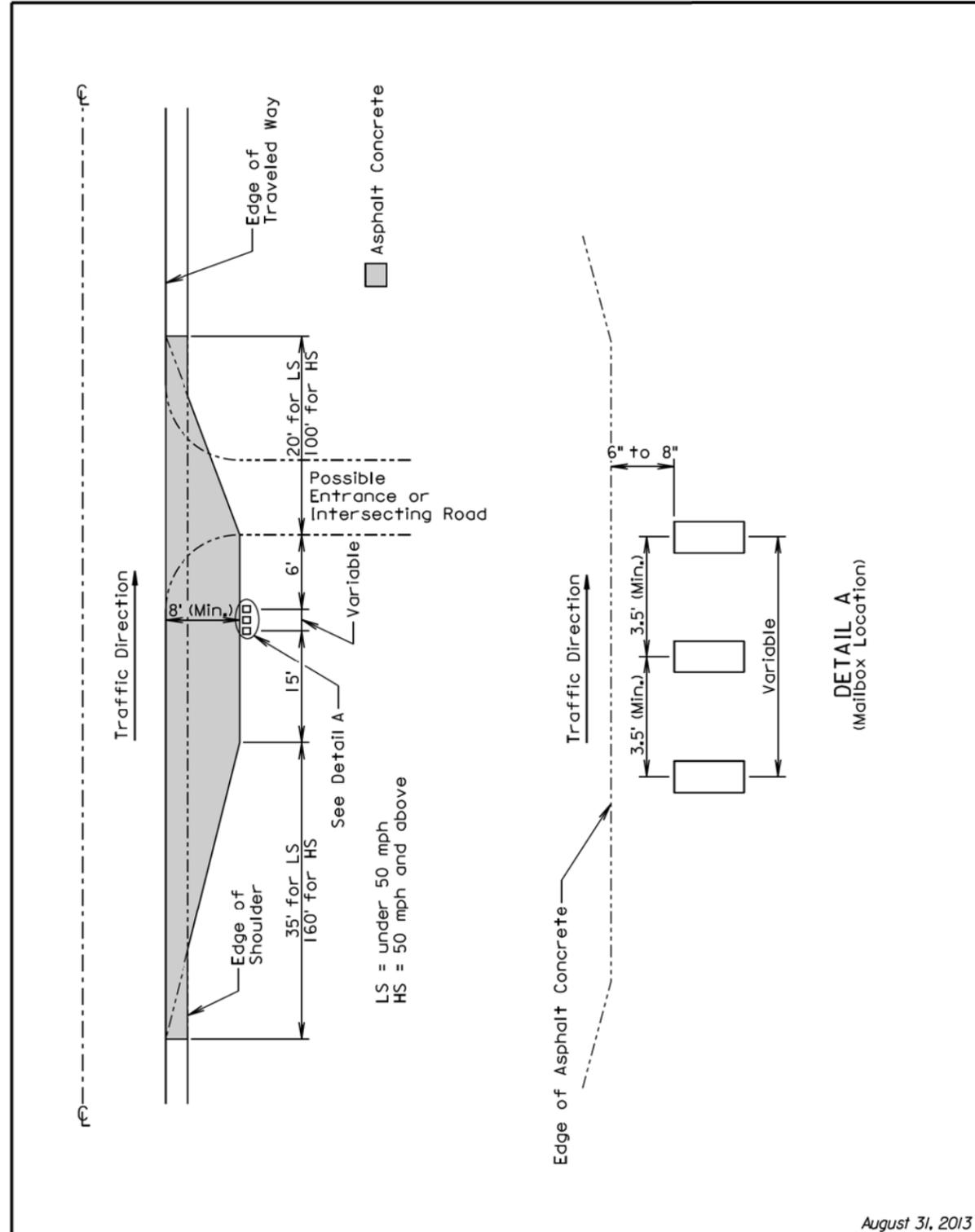
<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	PLATE NUMBER <b>632.40</b>
		Sheet 4 of 4

Published Date: 1st Qtr. 2015

PLOT NAME - 20 FILE - ... \STD PLATES 0367 & 04WB.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0281(110)105 NH 0281(109)145	74	75

Plotting Date: 02/06/2015



<i>Published Date: 1st Qtr. 2015</i>	<b>S D D O T</b>	<b>MAILBOX TURNOUT</b>	August 31, 2013
			PLATE NUMBER 900.01
			Sheet 1 of 1

