

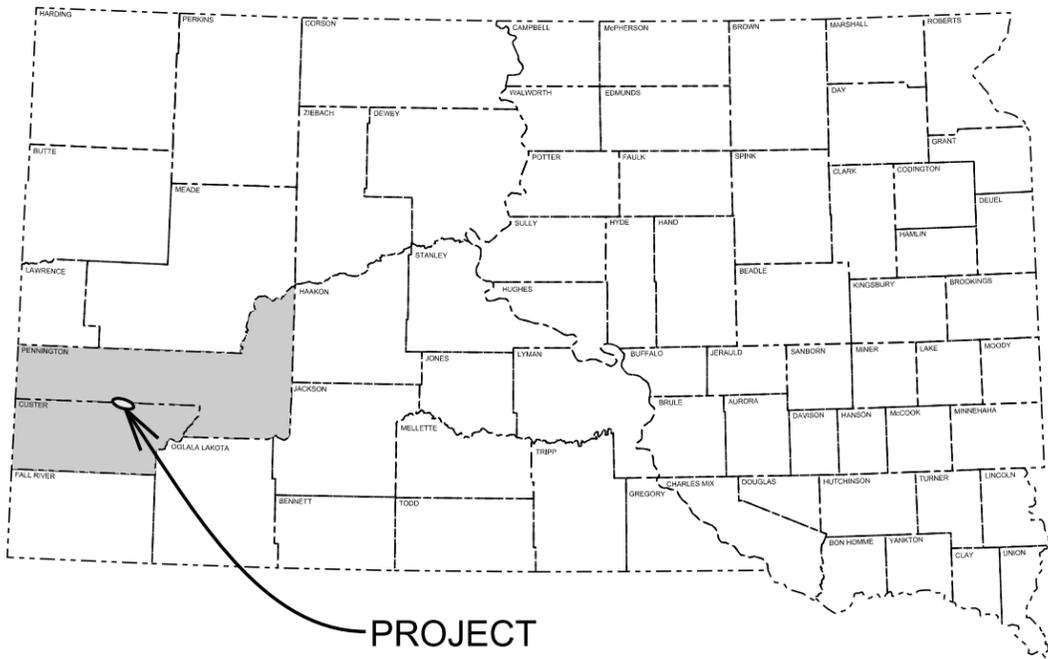
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	1	30
Plotting Date: 08/11/2015		Revised: 08-11-2015 kh	

PROJECT P 0040(21)38
SD HIGHWAY 40
PENNINGTON & CUSTER COUNTIES
ASPHALT CONCRETE RESURFACING
PCN 03T7

INDEX OF SHEETS

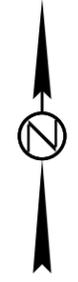
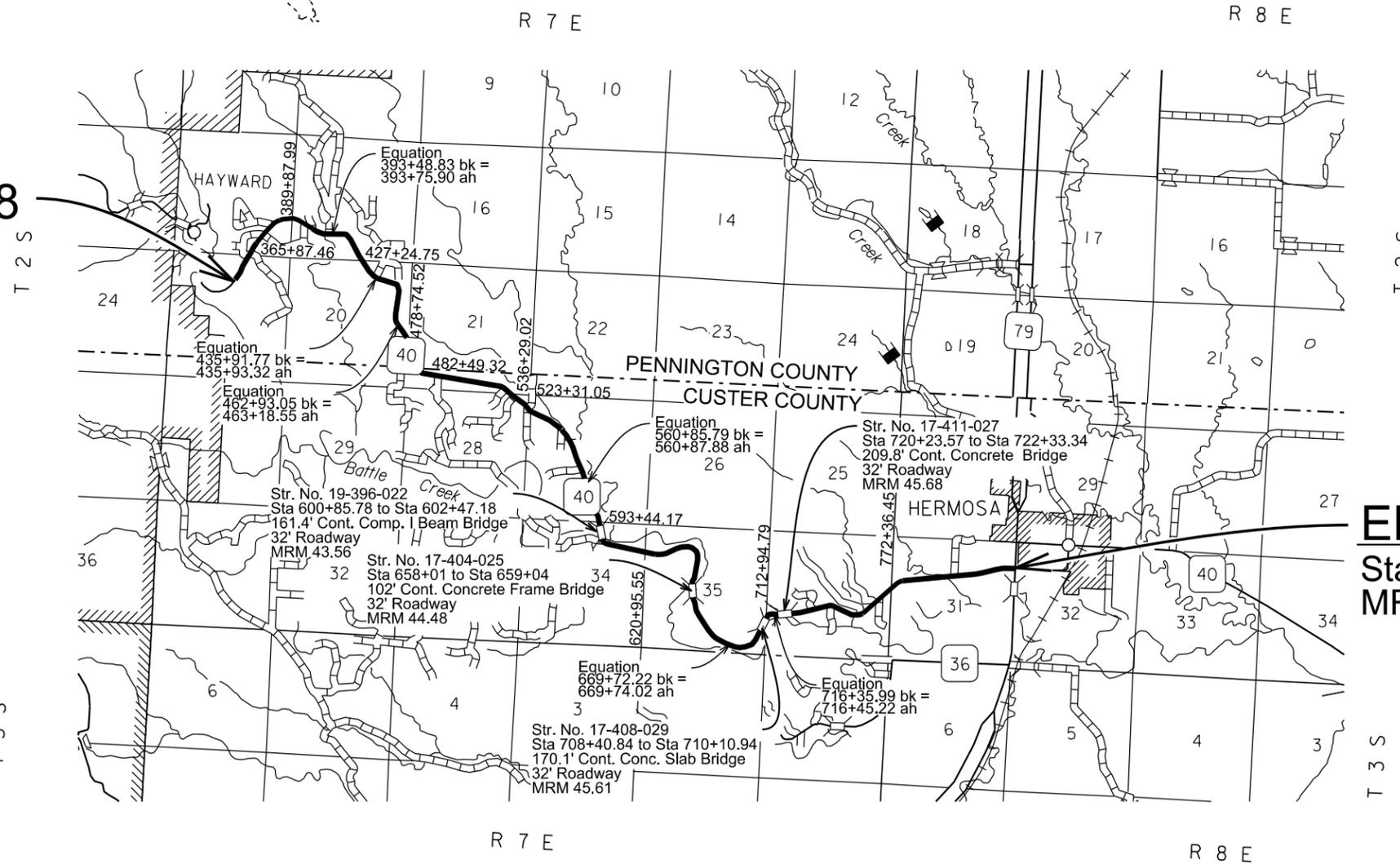
- B1 General Layout with Index
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PROJECT

Plot Scale - 1:200

BEGIN P 0040(21)38
Sta 354+72.94
MRM 38.26 + 0.568



END P 0040(21)38
Sta 824+94.61
MRM 47.81

DESIGN DESIGNATION

ADT (2014)	895
ADT (2034)	1141
DHV	173.4
D	51 %
T DHV	3.9 %
T ADT	8.5 %
V	50 mph

STORM WATER PERMIT

None Required

GROSS LENGTH	46,954.43 FEET	8.8929 MILES
LENGTH OF EXCEPTIONS	644.3 FEET	0.1220 MILES
NET LENGTH	46,310.16 FEET	8.7709 MILES

3

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ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	2	30

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3320	Checker	Lump Sum	LS
110E4290	Salvage Beam Guardrail	100.0	Ft
110E4380	Salvage W Beam Guardrail Tangent End Terminal	4	Each
110E6200	Remove Double Thrie Beam Guardrail for Reset	100.0	Ft
110E6230	Remove W Beam Guardrail for Reset	850.0	Ft
110E6240	Remove W Beam to Thrie Beam Guardrail Transition for Reset	8	Each
110E6270	Remove W Beam Guardrail Flared End Terminal for Reset	12	Each
120E0100	Unclassified Excavation, Dugouts	439	CuYd
120E0600	Contractor Furnished Borrow Excavation	300	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
260E1010	Base Course	1,402.7	Ton
260E1050	Base Course, Salvaged Asphalt Mix	406.0	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	86.4	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	37.9	Ton
330E2000	Sand for Flush Seal	453.4	Ton
332E0010	Cold Milling Asphalt Concrete	7,745	SqYd
600E0300	Type III Field Laboratory	1	Each
630E1150	Straight Double Class B W Beam Guardrail with Wood Posts	100.0	Ft
630E2015	W Beam Guardrail Flared End Terminal	4	Each
630E2110	Beam Guardrail Post and Block	212	Each
630E5130	Reset Double Thrie Beam Rail	100.0	Ft
630E5160	Reset W Beam Rail	850.0	Ft
630E5190	Reset W Beam to Thrie Beam Guardrail Transition	8	Each
630E5207	Reset W Beam Guardrail Flared End Terminal	12	Each
632E2220	Guardrail Delineator	64	Each
633E1300	Pavement Marking Paint, White	300	Gal
633E1305	Pavement Marking Paint, Yellow	225	Gal
634E0010	Flagging	440.0	Hour
634E0020	Pilot Car	220.0	Hour
634E0110	Traffic Control Signs	414	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0630	Temporary Pavement Marking	17.8	Mile
734E0010	Erosion Control	Lump Sum	LS
900E0010	Refurbish Single Mailbox	57	Each
900E0012	Refurbish Double Mailbox	39	Each

SPECIFICATIONS

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

SURFACING - ALT. A

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
320E0007	PG 64-28 Asphalt Binder	1,336.2	Ton
320E1002	Class Q2 Hot Mixed Asphalt Concrete	23,158.7	Ton
320E4000	Hydrated Lime	226.1	Ton

SURFACING - ALT. B

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
320E0007	PG 64-28 Asphalt Binder	1,171.2	Ton
320E1002	Class Q2 Hot Mixed Asphalt Concrete	23,676.2	Ton
320E4000	Hydrated Lime	234.8	Ton

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	3	30

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 E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the State ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the State ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating "No Dumping Allowed".
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all designated option borrow sites provided within the plans.

Action Taken/Required:

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

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

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

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

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

COMMITMENT R: FIRE PREVENTION IN THE BLACK HILLS AREA

This project is located within the confines of the Black Hills Forest Fire Protection Boundary.

Action Taken/Required:

The Contractor shall adhere to the "Special Provision for Fire Plan".

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	4	30

UTILITIES

The Contractor shall be responsible for locating and protecting any utility that would conflict with any work. 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.

Any damage done to a utility will be the Contractor's responsibility to repair.

CONTRACTOR FURNISHED BORROW EXCAVATION

Included in the Estimate of Quantities is 300 cubic yards of Contractor Furnished Borrow Excavation for embankment at the guardrail end terminals.

The Contractor shall provide a suitable site for Contractor furnished borrow excavation 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 Excavation" as shown in the Estimate of Quantities will be the basis of payment for this item.

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

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 usage only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer.

The Contractor shall submit a copy of each monthly bill for calls charged to this phone at the end of each month. The Project Engineer will then audit the bills to ensure all calls are legitimate and then initiate a Construction Change Order (CCO) to reimburse the Contractor for the actual phone calls made, including local and long distance calls. Reimbursement will not be made for fees associated with the purchase, installation, disconnection, monthly line charges, and incidentals involved in the installation, maintenance, and disconnection of the phone (including attachments). These items shall be incidental to the contract unit price per each for "Type III Field Laboratory".

SURFACING THICKNESS DIMENSIONS

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

INTERSECTING ROADS AND ENTRANCES

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

SHOULDER WORK

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.

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

WATER FOR COMPACTION

No separate payment will be made for the Water for Granular Material and all costs associated shall be incidental to the contract unit price per ton of "Base Course, Salvaged Asphalt Mix" and "Base Course". Four percent plus or minus, moisture will be required at the time of compaction unless otherwise directed by the Engineer.

EXCAVATION OF UNSTABLE MATERIAL

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

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

BASE COURSE

Included in the Estimate of Quantities are 100 tons of Base Course and/or Base Course, Salvaged Asphalt Mix per mile for backfill of Unclassified Excavation Digouts.

Compaction of the Base Course shall be to the satisfaction of the Engineer.

Base Course shall be Contractor furnished.

ADDITIONAL QUANTITIES

Included in the Table of Additional Quantities are:

400 tons of Class Q2 Hot Mixed Asphalt Concrete, 4.0 tons of Hydrated Lime, and 23.2 tons of PG 64-28 Asphalt Binder per mile for Alt A and 400 tons of Class Q2 Hot Mixed Asphalt Concrete, 4.0 tons of Hydrated Lime, and 20.0 tons of PG 64-28 Asphalt Binder per mile for Alt B for spot leveling, strengthening, and repair of the existing surface.

16 tons of SS-1h or CSS-1h Emulsified Asphalt for Tack for repair and leveling areas throughout the project.

COLD MILLING ASPHALT CONCRETE

Loose material resulting from the cold milling shall be immediately picked up, and stockpiled for use as Base Course, Salvaged Asphalt Mix.

Cold Milling Asphalt Concrete shall be performed as necessary at structures and the end of the project, so that the top mat of the new asphalt surfacing will match existing surfaces. The milling depths might vary due to irregularities in the surface.

The Los Angeles Abrasion Loss value on the aggregate used for the in place asphalt concrete was 25 percent. This value was obtained from testing during construction of the in place asphalt concrete.

Cold milling asphalt is estimated to produce 378 tons (200 Cubic Yards) of salvaged asphalt concrete material. An estimated 378 tons of salvage asphalt concrete will be used on this project as Base Course Salvaged Asphalt Mix.

BASE COURSE, SALVAGED ASPHALT MIX

Base Course, Salvaged Asphalt Mix shall be obtained from the material produced on this project and may be used without further testing. This material shall be used for backfilling digouts, intersecting roads, approaches and/or mailbox turnouts.

All other requirements for Base Course, Salvaged shall apply.

Compaction of the Base Course, Salvaged shall be to the satisfaction of the Engineer.

The contract unit price per ton for Base Course, Salvaged Asphalt Mix shall include loading, placing, and compacting the cold milled material.

CHECKING SPREAD RATES

The Contractor shall be responsible for checking the Asphalt Concrete Surfacing and Base Course spread rates and take the weigh delivery tickets as the surfacing material arrives on the project and is placed onto the roadway.

The Contractor shall compute the required spread rates for each typical surfacing section and create a spread chart prior to the start of material delivery and placement. The Engineer will review and check the Contractor's calculations and spread charts.

The station to station spread shall be written on each ticket as the surfacing material is delivered to the roadway.

At the end of each day's shift, the Contractor shall verify the following:

- All tickets are present and accounted for,
- The quantity summary for each item is calculated,
- The amount of material wasted if any,
- Each day's ticket summary is marked with the corresponding 'computed by',
- The ticket summary is initialed and certified that the delivered and placed quantity is correct.

All daily tickets and the summary by item shall be given to the Engineer no later than the following morning.

If the checker is not properly and accurately performing the required duties, the Contractor shall correct the problem or replace the checker with an individual capable of performing the duties to the satisfaction of the Engineer. Failure to do so will result in suspension of the work.

The Department will perform depth checks. The Contractor shall be responsible for placement of material to the correct depth unless otherwise directed by the Engineer. If the placed material is not within a tolerance of ±1/4" of the plan shown depth, the Contractor shall correct the problem at no additional cost to the Department. Excess material above the tolerance will not be paid for. Achieving the correct depth may require picking up and moving material or other action as required by the Engineer.

All costs for providing the Contractor furnished checker and performing all related duties shall be incidental to the contract lump sum price for the CHECKER. No allowances will be made to the contract lump sum price for CHECKER due to authorized quantity variations unless the quantities for the material being checked vary above or below the estimated quantities by more than 25%. Payment for the CHECKER shall then be increased or decreased by the same proportion as the placed material quantity bears to the estimated material quantity.

CLASS Q2 HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:
Mineral Aggregate for Class Q2 Hot Mixed Asphalt Concrete - Alternate A shall conform to the requirements of Class Q2.

Mineral Aggregate for Class Q2 Hot Mixed Asphalt Concrete - Alternate B shall consist of a minimum of 80 percent crushed limestone ledgerrock and shall conform to the requirements of Class Q2.

Mix Design Criteria:
Gyratory Controlled QC/QA Mix Design requirements for the Class Q2 Hot Mixed Asphalt Concrete – Alternate B shall conform to the requirements of Class Q2 except as modified by the following:

Voids in Mineral Aggregate (VMA):

	Minimum VMA (%):
Class Q2	13.0

All remaining requirements for Class Q2 shall apply.

RATES OF MATERIALS

Sta. 354+72.94 to Sta. 824+94.61

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

**2" LIFT
CLASS Q2 HOT MIXED ASPHALT CONCRETE**

	Alt A	Alt B	
Aggregate	2024	2097	Tons
PG 64-28 Asphalt Binder	125	110	Tons
Total Mix	2149	2207	Tons
Hydrated Lime	21	22	Tons
Total Mix with Hydrated Lime	2170	2229	Tons

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

SS-1h or CSS-1h Emulsified Asphalt for Tack applied at the rate of 7.854 ton applied 35 feet wide (0.09 gallons per square yard).

FLUSH SEAL

SS-1h or CSS-1h Asphalt for Flush Seal at the rate of 4.240 ton applied 34 feet wide (Rate = 0.05 gallon per square yard).

Sand for Flush Seal at the rate of 51.627 ton applied 22 feet wide (Rate = 8 lbs. per square yard).

TABLE OF QUANTITIES

Station to	Station	Length Ft	Unclassified Excavation, Digouts CuYd	Cold Milling Asphalt Concrete Sq Yd	Base Course, Salvaged Asphalt Mix Ton	Base Course Ton	SS-1h or CSS-1h Asphalt for Tack Ton	PG 64-28 Asphalt Binder Ton	Alt A			Alt B			SS-1h or CSS-1h Asphalt for Flush Seal Ton	Sand for Flush Seal Ton
									Class Q2 Hot Mixed Asphalt Concrete Ton	Hydrated Lime Ton	PG 64-28 Asphalt Binder Ton	Class Q2 Hot Mixed Asphalt Concrete Ton	Hydrated Lime Ton			
354+72.94	393+48.83	3875.89	36.8	756		73.5	5.77	91.8	1593	15.5	80.75	1636.3	16.2	3.2	37.9	
393+48.83	393+75.90	Equation														
393+75.90	435+91.77	4215.87	40			79.9	6.28	99.9	1732.7	16.8	87.84	1779.8	17.6	3.4	41.3	
435+91.77	435+93.32	Equation														
435+93.32	462+93.05	2699.73	25.6			51.2	4.02	64	1109.6	10.8	56.25	1139.8	11.3	2.2	26.4	
462+93.05	463+18.55	Equation														
463+18.55	560+85.79	9767.24	92.5			185	14.53	231.3	4014.2	38.9	203.49	4123.4	40.7	7.9	95.6	
560+85.79	560+87.88	Equation														
560+87.88	600+85.78	3997.90	37.9	756		75.8	5.95	94.7	1643.1	16	83.29	1687.8	16.7	3.3	39.1	
600+85.78	602+47.18	Structure	161.4													
602+47.18	658+01.00	5553.82	52.6	1512		105.2	8.27	131.5	2282.6	22.1	115.71	2344.6	23.2	4.5	54.4	
658+01.00	659+04.00	Structure	103.0													
659+04.00	669+72.22	1068.22	10.2	756		20.3	1.59	25.3	439.1	4.3	22.26	451	4.5	0.9	10.5	
669+72.22	669+74.02	Equation														
669+74.02	708+40.84	3866.82	36.7	756		73.3	5.76	91.6	1589.3	15.4	80.56	1632.5	16.2	3.2	37.9	
708+40.84	710+10.94	Structure	170.1													
710+10.94	716+35.99	625.05	6	756		11.9	0.93	14.8	256.9	2.5	13.03	263.9	2.7	0.6	6.2	
716+35.99	716+45.22	Equation														
716+45.22	720+23.57	378.35	3.6	756		7.2	0.57	9	155.5	1.6	7.89	159.8	1.6	0.4	3.7	
720+23.57	722+33.34	Structure	209.8													
722+33.34	824+94.61	10261.27	97.2	1697		194.4	15.27	243	4217.3	40.9	213.78	4331.9	42.8	8.3	100.4	
Additional Quantities Totals:			0	0	406	525	17.5	239.3	4125.4	41.27	206.35	4125.4	41.27	0	0	
			46954.43	439.10	7745	406	1402.7	86.44	1336.20	23158.7	226.07	1171.20	23676.2	234.77	37.9	453.4

TABLE OF ADDITIONAL QUANTITIES

	Length Ft	Unclassified Excavation, Digouts CuYd	Coldmilling Asphalt Concrete Sq Yd	Base Course, Salvaged Asphalt Mix Ton	Base Course Ton	SS-1h or CSS-1h Asphalt for Tack Ton	PG 64-28 Asphalt Binder Ton	Alt A			Alt B			SS-1h or CSS-1h Asphalt for Flush Seal Ton	Sand for Flush Seal Ton
								Class Q2 Hot Mixed Asphalt Concrete Ton	Hydrated Lime Ton	PG 64-28 Asphalt Binder Ton	Class Q2 Hot Mixed Asphalt Concrete Ton	Hydrated Lime Ton			
Spot leveling, strengthening, & repair of existing surfacing	46310.16					16	203.5	3508.4	35.1	175.5	3508.4	35.1			
Asphalt Approaches (5) *							0.87	15	0.15	0.75	15	0.15			
Gravel Approaches (61) **					305		10.62	183	1.83	9.15	183	1.83			
Field Entrances (37) ***				25	160				0	0		0			
Intersection Hwy 79						0.7	1.28	22	0.22	1.1	22	0.22			
Guardrail widening					60		10.5	181	1.81	9.05	181	1.81			
Mailbox turnouts				381		0.8	12.53	216	2.16	10.8	216	2.16			
Additional Quantities Totals:			0	0	406	525	17.5	239.3	4125.4	41.3	206.4	4125.4	41.3	0	0

Surfacing for Approaches and Field Entrances

* Asphalt approaches will be surfaced with a 2" thick asphalt pad by 5' wide, the pad will be tapered to the existing asphalt.

** Gravel approaches will be surfaced with a 2" thick asphalt pad by 5' wide & 5 ton of Base Course to blend the existing gravel approach to the asphalt pad.

*** Field Entrances will be surfaced with 5 ton of Base Course or Base Course, Salvaged Asphalt Mix.

SUMMARY OF ASPHALT CONCRETE COMPACTION

Section	Station to	Station	Length Ft	Alt A		Alt B	
				Asphalt Concrete Class Q2 with Specified Compaction Ton	Asphalt Concrete Class Q2 without Specified Compaction Ton	Asphalt Concrete Class Q2 with Specified Compaction Ton	Asphalt Concrete Class Q2 without Specified Compaction Ton
1	354+72.94	393+48.83	3875.89	1147.3	445.7	1178.3	458.0
	393+48.83	393+75.90	Equation				
1	393+75.90	435+91.77	4215.87	1247.9	484.8	1281.7	498.1
	435+91.77	435+93.32	Equation				
1	435+93.32	462+93.05	2699.73	799.2	310.4	820.8	319.0
	462+93.05	463+18.55	Equation				
1	463+18.55	560+85.79	9767.24	2891.2	1123.0	2969.3	1154.1
	560+85.79	560+87.88	Equation				
1	560+87.88	600+85.78	3997.90	1183.4	459.7	1215.4	472.4
	600+85.78	602+47.18	Structure 161.4				
1	602+47.18	658+01.00	5553.82	1644.0	638.6	1688.4	656.2
	658+01.00	659+04.00	Structure 103.0				
1	659+04.00	669+72.22	1068.22	316.2	122.9	324.8	126.2
	669+72.22	669+74.02	Equation				
1	669+74.02	708+40.84	3866.82	1144.6	444.7	1175.6	456.9
	708+40.84	710+10.94	Structure 170.1				
1	710+10.94	716+35.99	625.05	185.1	71.8	190.1	73.8
	716+35.99	716+45.22	Equation				
1	716+45.22	720+23.57	378.35	112.0	43.5	115.1	44.7
	720+23.57	722+33.34	Structure 209.8				
1	722+33.34	824+94.61	10261.27	3037.4	1179.9	3119.5	1212.4
	Additional Quantities			0	4125.4	0	4125.4
	Totals:			13708.3	9450.4	14079.0	9597.2

TABLE OF GUARDRAIL

Location	Salvage Beam Guardrail Ft	Salvage W Beam Guardrail Tangent End Terminal Each	Remove Double Thrie Beam Guardrail for Reset Ft	Remove W Beam Guardrail for Reset Ft	Remove W Beam to Thrie Beam Guardrail Transition for Reset Each	Remove W Beam Guardrail Flared End Terminal for Reset Each	Straight Double Class B W Beam Guardrail w/ Wood Posts Ft	W Beam Guardrail Flared End Terminal Each	Reset Double Thrie Beam Rail Ff	Reset W Beam Rail Ft	Reset W Beam to Thrie Beam Guardrail Transition Each	Reset W Beam Guardrail Flared End Terminal Each	Furnish Beam Guardrail Post and Block Each	Guardrail Delineator Each	Contractor Furnished Borrow cuyd
Structure No. 17-396-022															
Begin Bridge Lt.		1	12.5	112.5	1			1	12.5	25	1		10	4	25
End Bridge Lt.	75	1	12.5	87.5	1			1	12.5	87.5	1		15	4	25
Begin Bridge Rt.		1	12.5	112.5	1			1	12.5	87.5	1		15	4	25
End Bridge Rt.		1	12.5	87.5	1			1	12.5	25	1		10	4	25
Structure No. 17-404-025															
Begin Bridge Lt.	12.5			25		1	12.5			25		1	9	4	
End Bridge Lt.	12.5			25		1	12.5			87.5		1	14	4	25
Begin Bridge Rt.	12.5			25		1	12.5			37.5		1	10	4	25
End Bridge Rt.	12.5			25		1	12.5			25		1	9	4	
Structure No. 17-408-029															
Begin Bridge Lt.			12.5	37.5	1	1			12.5	25	1	1	16	4	25
End Bridge Lt.			12.5	75	1	1			12.5	87.5	1	1	21	4	25
Begin Bridge Rt.			12.5	75	1	1			12.5	87.5	1	1	21	4	25
End Bridge Rt.			12.5	62.5	1	1			12.5	25	1	1	16	4	25
Structure No. 17-411-027															
Begin Bridge Lt.	12.5			25		1	12.5			25		1	9	4	
End Bridge Lt.	12.5			25		1	12.5			87.5		1	14	4	25
Begin Bridge Rt.	12.5			25		1	12.5			87.5		1	14	4	25
End Bridge Rt.	12.5			25		1	12.5			25		1	9	4	
TOTALS:	175	4	100	850	8	12	100	4	100	850	8	12	212	64	300

SALVAGE BEAM GUARDRAIL

Steel beam rail, end terminals, and hardware items shall become the property of the State and shall be removed, hauled, and neatly stacked at the Keystone Yard located on US 16 at the Keystone Y as approved by the Engineer. Posts and blocks shall become the property of the Contractor and shall be removed from the project limits.

Payment for removing, hauling, and stacking the guardrail items shall be incidental to the contract unit price per foot for "Salvage Beam Guardrail".

RESET W BEAM GUARDRAIL END TERMINALS

Bid items are provided for resetting "W Beam Guardrail Flared End Terminal" at the locations provided in the table of guardrail. An additional quantity of "Beam Guardrail Post and Block" has been provided for installing new posts in the W Beam Guardrail Terminals. New post and blocks used to reset the end terminal shall be the same size and type required for the specific end terminal being installed. Existing HBA post are to be reset. All costs associated with this work shall be incidental to the contract unit price per each for resetting "W Beam Guardrail Flared Terminal" and "Beam Guardrail Post and Block".

RESET BEAM GUARDRAIL

At locations where the Reset W Beam Rail is more than the Remove W Beam Guardrail for Reset the Contractor shall utilize W beam guardrail removed at other locations on the project. The total amount of salvaged W beam has been reduced to accommodate the additional W beam guardrail needed for reset.

The Contractor shall not reset beam guardrail that has drilled holes, extra holes, tears and dent 6" or greater.

GUARDRAIL DELINEATORS

The Contractor shall place guardrail delineators on all portions of guardrail as per standard plate 632.40. All costs for furnishing and installing guardrail delineation shall be incidental to the contract unit price per each for "Guardrail Delineator".

The delineator shall be fabricated from 0.080" aluminum and the use of flexible plastic will not be allowed as shown on standard plate 632.40.

MAILBOXES

The Contractor shall reset the existing mailboxes on new posts with the necessary support hardware for single or double mailbox assemblies. The local Postmaster will determine the recommended mounting height of the mailboxes throughout the project. The Contractor shall coordinate with the Engineer on the proper postal representative to contact.

If large mailboxes are located at double mailbox installations, a single post may need to be used for the large mailbox.

All costs for removing existing mailboxes, providing temporary mailboxes, and resetting mailboxes with new posts and necessary support hardware shall be incidental to the contract unit price per each for "Refurbish Single Mailbox" or "Refurbish Double Mailbox".

TABLE OF REFURBISH MAILBOX

MRM	L/R	Single (Each)	Double (Each)
38.0 + 0.84	R	1	1
39.0 + 0.12	R	1	1
39.0 + 0.22	R		5
39.0 + 0.14	R	1	
39.0 + 0.47	R	1	
39.0 + 0.56	R		1
39.0 + 0.60	R	1	
39.0 + 0.65	R	1	
40.0 + 0.11	R	1	
40.0 + 0.92	R	1	
41.0 + 0.04	R	1	2
41.0 + 0.12	R		1
41.0 + 0.26	R	1	
41.0 + 0.37	R	3	3
41.0 + 0.46	R	1	
41.0 + 0.48	R	1	
41.0 + 0.62	R	1	
41.0 + 0.68	R	1	1
41.0 + 0.84	R	1	
41.0 + 0.92	R		1
42.0 + 0.01	R	1	
42.0 + 0.05	R	5	5
42.0 + 0.17	R		1
42.0 + 0.21	R	3	1
42.0 + 0.33	R	2	
42.0 + 0.48	R	1	
42.0 + 0.50	R	1	1
42.0 + 0.66	R	1	
42.0 + 0.85	R	2	
43.0 + 0.10	R		1
43.0 + 0.24	R	1	
43.0 + 0.36	R	1	
44.0 + 0.55	R	1	
45.0 + 0.24	R	2	2
45.0 + 0.50	R	1	
45.0 + 0.64	R	1	
45.0 + 0.68	R	1	
45.0 + 0.85	R	1	
46.0 + 0.01	R	1	3
46.0 + 0.12	R	1	
46.0 + 0.13	R	1	
46.0 + 0.17	R	1	
46.0 + 0.43	R	1	2
46.0 + 0.53	R	5	3
46.0 + 0.61	R	2	2
46.0 + 0.72	R	1	2
47.0 + 0.4	R	1	
Totals:		57	39

REMOVE AND REPLACE TOPSOIL

Topsoil shall be salvaged and stockpiled prior to constructing mail box turnouts and guardrail embankment area(s). Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction, topsoil shall be spread evenly over the disturbed areas.

The estimated amount of topsoil to be removed and replaced is 370 CuYd.

All cost associated with removing and replacing the topsoil along areas to be resurfaced shall be incidental to the lump sum price for "Remove and Replace Topsoil".

EROSION CONTROL

The contract lump sum price for Erosion Control shall include all material, equipment, and labor necessary to seed, mycorrhizal inoculum, fertilizer and fiber mulch all areas disturbed by construction of this project. The Engineer, at the time of construction, shall determine limits of the Erosion Control work. The estimated area to be seeded is approximately 0.68 acre.

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

All seed shall be inoculated with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

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

Product
MycoApply

Manufacturer
Mycorrhizal Applications, Inc.
Grants Pass, OR
Phone: 1-866-476-7800
<http://www.mycorrhizae.com/>

FERTILIZING

The Contractor shall apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 3.2%, a minimum of 6% (P2O5) available phosphate, a minimum of 4% (K2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer shall be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer shall have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer shall also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The all-natural slow release fertilizer shall be applied according to the manufacturer's application recommendations.

The application rate is 2,000 pounds per acre.

The all-natural slow release fertilizer shall be from the list below or an approved equal:

<u>Product</u>	<u>Manufacturer</u>
Sustane	Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 http://www.sustane.com/

PERMANENT SEEDING

Type F Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Flintlock, Rodan, Rosana	14
Green Needlegrass	Lodorm	8
Sideoats Grama	Butte, Killdeer, Pierre, Trailway	6
Blue Grama	Bad River, Willis	4
Oats or Spring Wheat: April through May; Winter Wheat: August through November		20
Total:		52

The areas to be seeded, fertilized, and mulched are estimated at 0.68 acres.

Limits of Erosion Control work will be as determined by the Engineer on construction.

FIBER MULCHING

Fiber mulch shall be applied in a separate operation following permanent seeding.

An additional 2% by weight of tackifier shall be added to the fiber mulch product selected from the approved product list. If the product selected has guar gum tackifier included, then the additional 2% of tackifier shall be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier shall be synthetic.

The Contractor shall allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials shall be incidental to the contract lump sum price for "Erosion Control".

The fiber mulch provided shall be from the approved product list. The approved product list for fiber mulch may be viewed at the following internet site:

<http://sddot.com/business/certification/products/Default.aspx>

SEQUENCE OF OPERATIONS

All work requiring lane closures shall be controlled using the standards in plate number 634.23, "Guides for Traffic Control Devices Lane Closure with Flagger Provided". The Contractor shall coordinate his operations such that during non-working hours the roadway shall be open to two-way traffic for the entire width of the roadway. During the use of the pilot car, the Contractor will be limited to 15 minute traffic delays.

Variations from this sequence shall be submitted to the Engineer for approval.

1. Set up traffic control.
2. Remove existing vegetation and loose material from the top of the shoulder.
3. Remove guardrail & build guardrail embankment.
4. Complete cold milling asphalt concrete.
5. Distribute cold milled material as needed for digouts, entrances, and intersecting roads.
6. Complete asphalt concrete paving.
7. Complete flush seal operation.
8. Complete guardrail installation
9. Restore disturbed areas affected by construction.
10. Complete Pavement Marking.
11. Remove Traffic Control.

The intent of the plan sequence of operations is to have the least amount of impact on the traveling public. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of two weeks prior to potential implementation.

MAINTENANCE OF APPROACHES DURING OPERATIONS

Operations shall be conducted such that access to individual entrances shall be maintained at all times throughout the project.

WIDTH RESTRICTION

Traffic control shall be placed so a 17' wide load can pass through the project during all hours. A 14' wide restriction during working hours will be allowed provided flaggers are used and traffic control is adjusted to allow a 17' wide load to pass. Payment for moving traffic control to allow for a 17' wide load shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

TRAFFIC CONTROL – GENERAL NOTES

1. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.
2. Unless otherwise stated in these plans, no work will be allowed during hours of darkness.
3. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.
4. Existing guide, route, informational logo, regulatory, warning signs and delineation shall be temporarily reset and maintained during construction as directed by the Engineer. Removing, relocating, salvaging and resetting of the above items shall be the responsibility of the Contractor.
5. Construction signing mounted on portable supports shall not be used for a duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.
6. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.
7. All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.
8. All construction operations shall be conducted in the general direction of traffic movement.
9. If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD – whichever is more stringent shall be used, as determined by the Engineer.
10. The Contractor shall furnish, install and maintain Truck Crossing signs. The exact number and location will be determined upon construction. Payment for additional signs will be based on the contract unit price per square foot for traffic control. The Truck Crossing signs shall be displayed at all times when haul vehicles are hauling material. When the truck haul conditions no longer exist, the signs shall be covered or removed from view.

TEMPORARY PAVEMENT MARKING

Temporary pavement markings for the centerline of the roadway throughout the full length of the project shall meet the requirements of Section 634 of the Specifications.

The Contractor shall be responsible for maintaining a visible and reflective centerline throughout the project. Any marking covered or damaged shall be replaced prior to the end of the day. All costs associated with this work shall be incidental to the contract unit price per mile for "Temporary Pavement Marking".

The Contractor shall use "DO NOT PASS" and "PASS WITH CARE" signs for a period of no more than 2 weeks after paving is complete to mark no passing zones on roads following application of flush seal.

ROUTE	ESTIMATED DO NOT PASS SIGNS	ESTIMATED PASS WITH CARE SIGNS	ESTIMATE D TOTAL MILES NO PASSING ZONE
US Highway 40	21	21	11.56

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".

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

TEMPORARY FLEXIBLE VERTICAL MARKERS (TABS)

Temporary Flexible Vertical Markers (Tabs) shall be used until permanent pavement marking is applied, and as directed by Engineer.

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

The markers will be paid for twice, once for placing the tabs on the asphalt concrete surface, and once for the removal of the covers after the flush seal. The markers shall be installed and will be paid for at the contract unit price per foot per 4" line for both Yellow and White markers. The contract unit price per foot for "Temporary Pavement Marking" will be full compensation for all costs associated to furnish, install, maintain (including replacement as required by the Engineer at no added cost to the Department), and remove all markers.

TABLE OF TRAFFIC CONTROL

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W3-4	BE PREPARED TO STOP	2	48" x 48"	16	32
W8-1	BUMP	6	48" x 48"	16	96
W8-6	TRUCK CROSSING	2	48" x 48"	16	32
W8-11	UNEVEN LANES	2	48" x 48"	16	32
W20-1	ROAD WORK AHEAD	4	48" x 48"	16	64
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16	32
W20-7	FLAGGER (symbol)	2	48" x 48"	16	32
W21-2	FRESH OIL	2	48" x 48"	16	32
W21-5	SHOULDER WORK	2	48" x 48"	16	32
G20-1	ROAD WORK NEXT _ MILES	2	36" x 18"	5	10
G20-2	END ROAD WORK	4	36" x 18"	5	20
CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT					414

PERMANENT PAVEMENT MARKINGS

Application of permanent pavement marking paint shall be completed within 14 calendar days following the completion of the flush seal. A minimum 7 day cure time shall be required for the Flush Seal prior to pavement marking paint application.

The Contractor shall survey and re-mark disturbed Passing/No Passing zone markings as they currently exist.

All materials shall be applied as per manufacturer's recommendations.

All pavement markings shall be a Waterborne Pavement Marking Paint.

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 or advance warning arrow panel.

PAVEMENT MARKING RATES OF APPLICATION

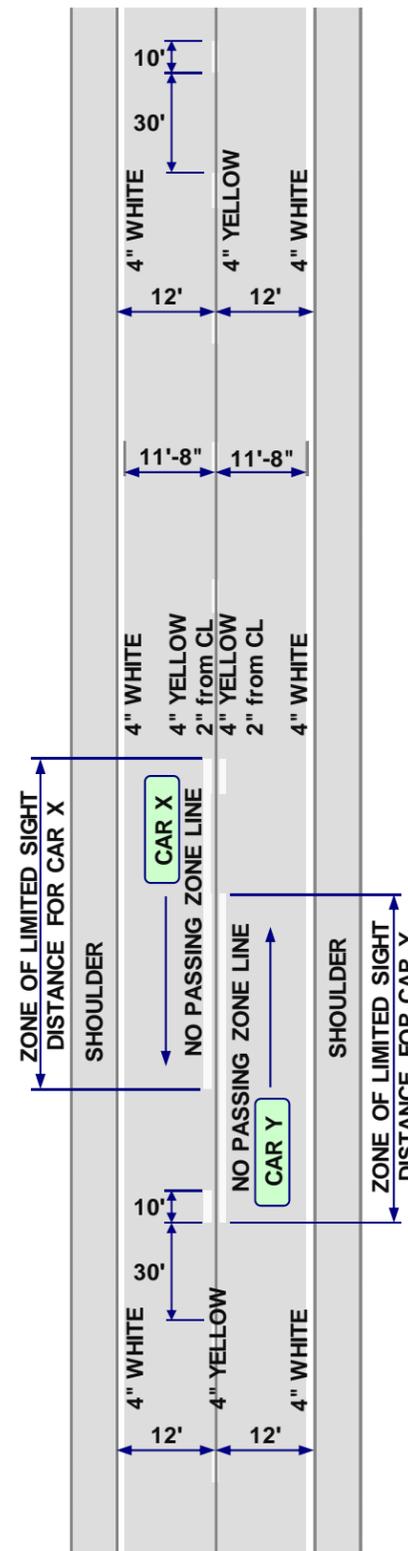
Approximate paint application rates shall be as follows:

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.

Centerline striping (yellow) – 25.0 gallons per mile. *

* Rate above is the Region average. The actual gallons used will vary depending upon the number of no passing zones.

TWO LANE ROADWAY



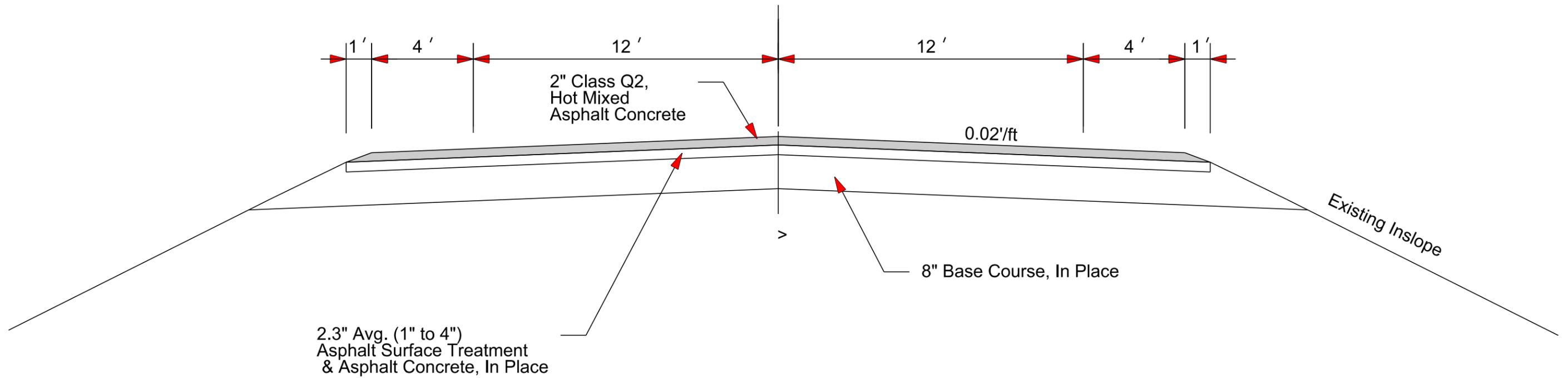
TYPICAL SURFACING SECTION

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	13	30

Plotting Date: 08/06/2015

SECTION 1

Sta. 354+72.94 to Sta. 824+94.61



Plot Scale - 1:40

Plotted From - trcs11610

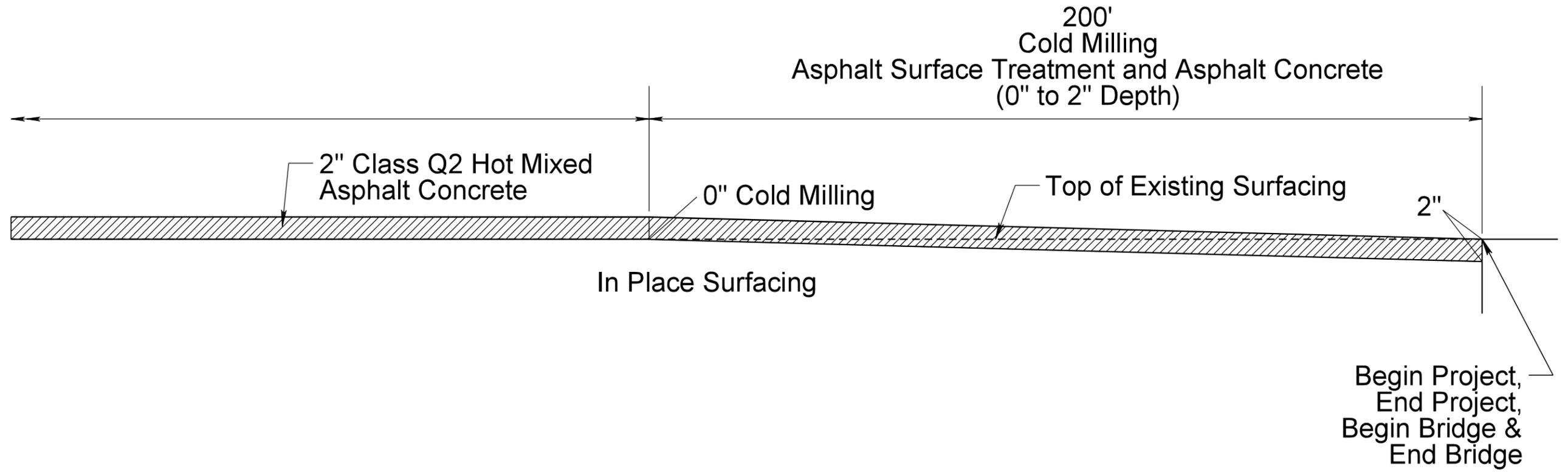
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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	14	30

Plotting Date: 08/06/2015

COLD MILLING ASPHALT CONCRETE

BEGIN & END OF PROJECT
 BEGIN & END OF STRUCTURES
 Str. No. 17-396-022 MRM 43.56
 Str. No. 17-404-025 MRM 44.48
 Str. No. 17-408-029 MRM 45.61
 Str. No. 17-411-027 MRM 45.68



Plot Scale - 1:20

Plotted From - trcs11610

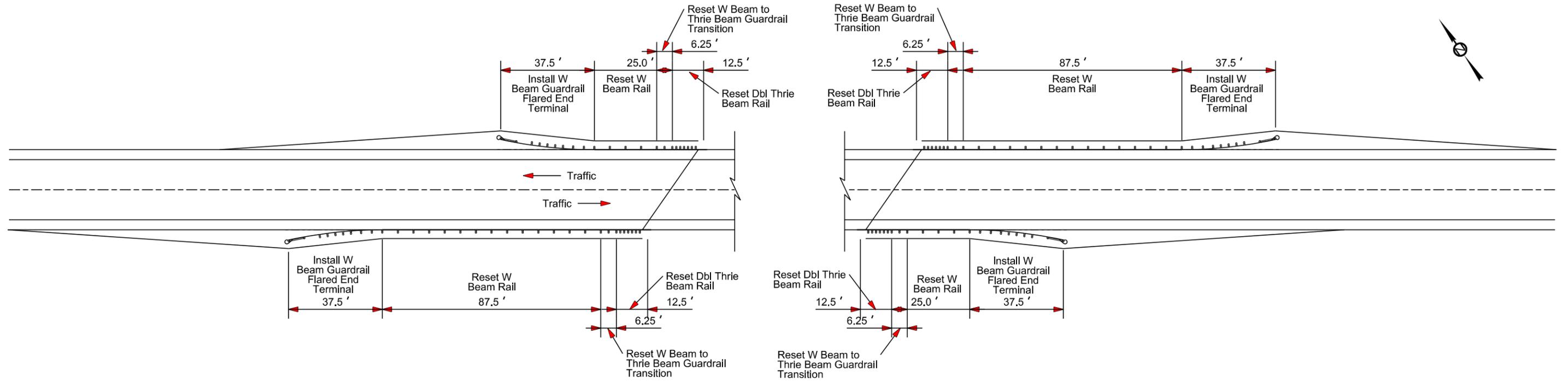
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GUARDRAIL LAYOUTS

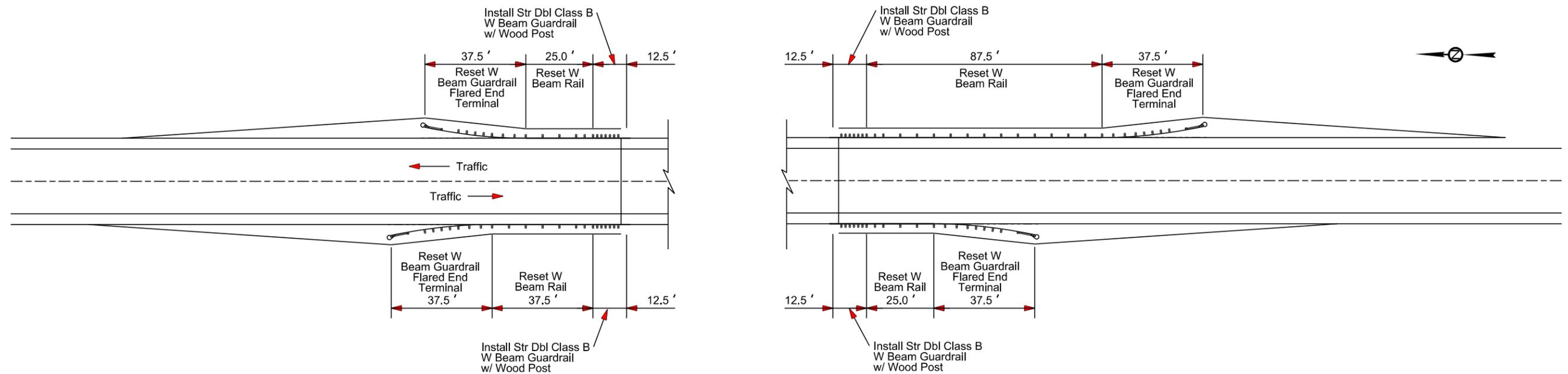
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	15	30

Plotting Date: 08/06/2015

Str. No. 17-396-022



Str. No. 17-404-025



Plot Scale - 1:40

trrc11610

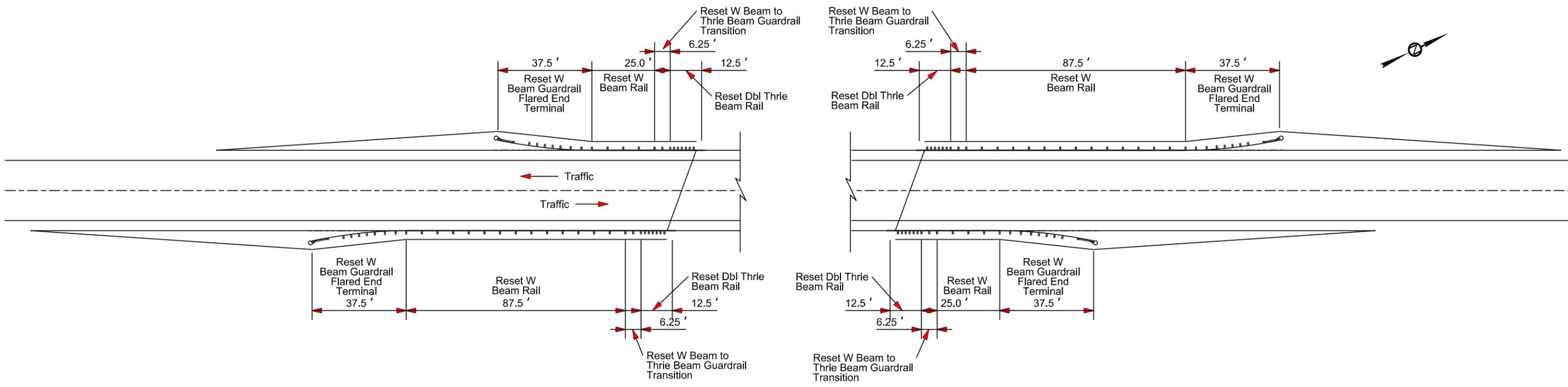
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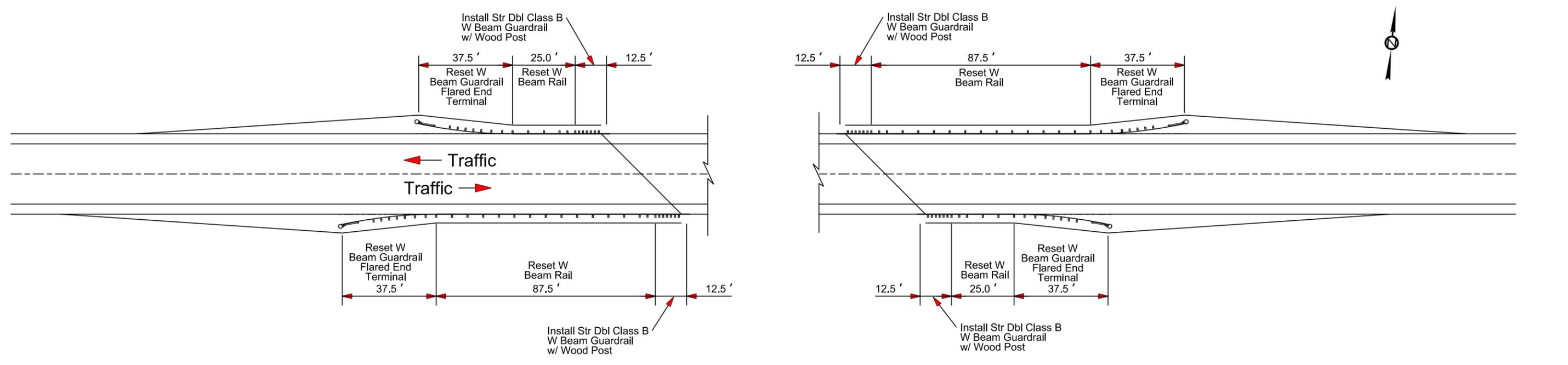
GUARDRAIL LAYOUTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	16	30
Plotting Date: 08/06/2015			

Str. No. 17-408-029



Str. No. 17-411-027



Plot Scale - 1:40

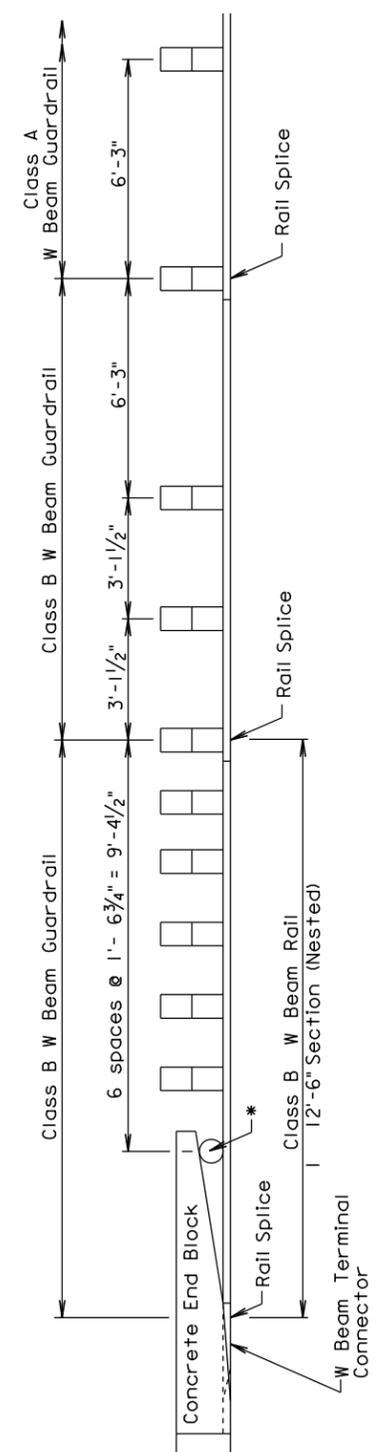
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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0040(21)38	17	30

Plotting Date: 08/06/2015

**POST SPACING ARRANGEMENT FOR
W BEAM GUARDRAIL AT BRIDGE END**

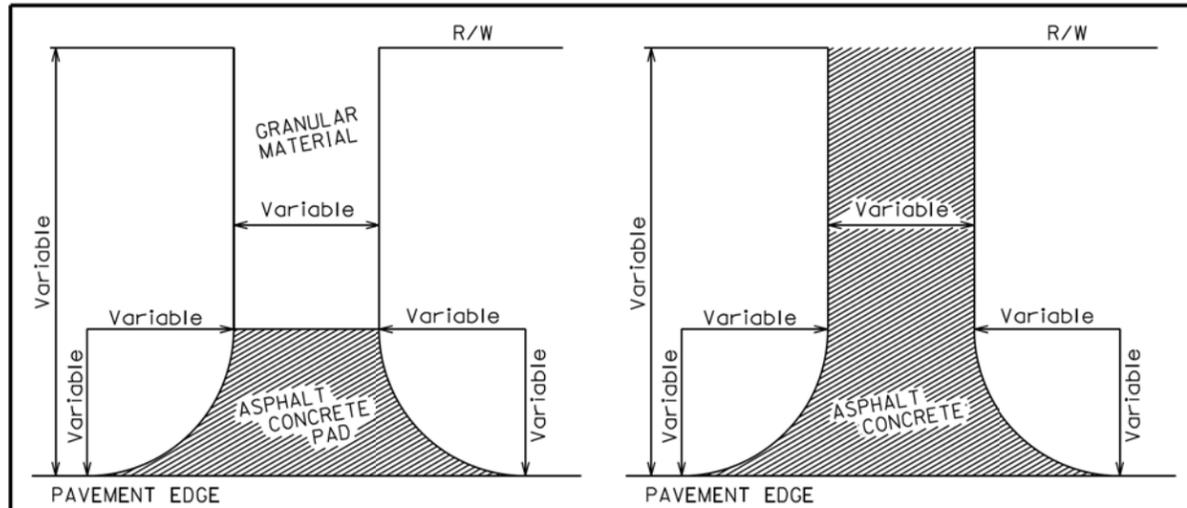


- * Remove and discard the in place tapered block and $\frac{5}{8}$ " threaded bolt. Install at the same location a 6" I.D. x 9" long schedule 40 galvanized pipe. Fasten to nested rails with 2" button head bolt with nut, rectangular plate washer, and $\frac{5}{8}$ " bolt washer.
- * All costs incurred to remove the block and furnish and install the pipe shall be incidental to the contract unit price per foot for "Straight Class B W Beam Rail".

Plot Scale - 1:200

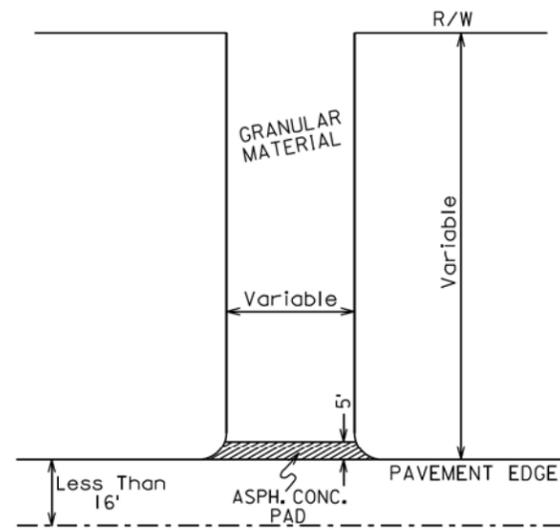
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INTERSECTING ROAD
NO ASPHALT CONCRETE SURFACING
BEYOND R/W

INTERSECTING ROAD
ASPHALT CONCRETE SURFACING
BEYOND R/W



ENTRANCE

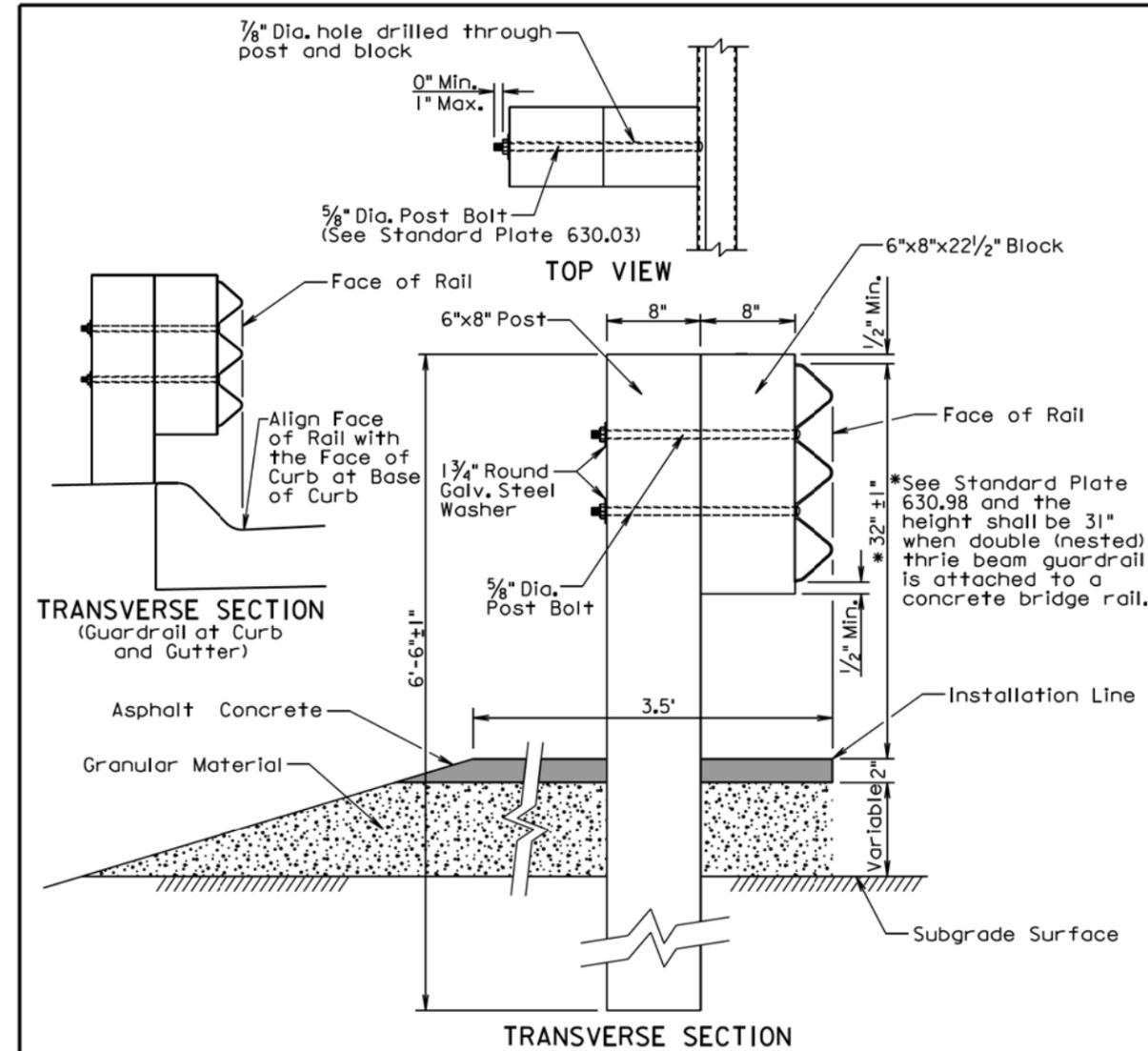
The surfacing details shown on this sheet are provided as a guide for surfacing these facilities. The precise construction limits for situations other than the standards shown will be determined by the Engineer, at the time of construction.

ROADWAY WITH OR WITHOUT SHOULDER

March 31, 2000

S D D O T	RESURFACING OF INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 320.10
		Sheet 1 of 1

Published Date: 3rd Qtr. 2015



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 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 Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline surfacing or as specified in the plans.

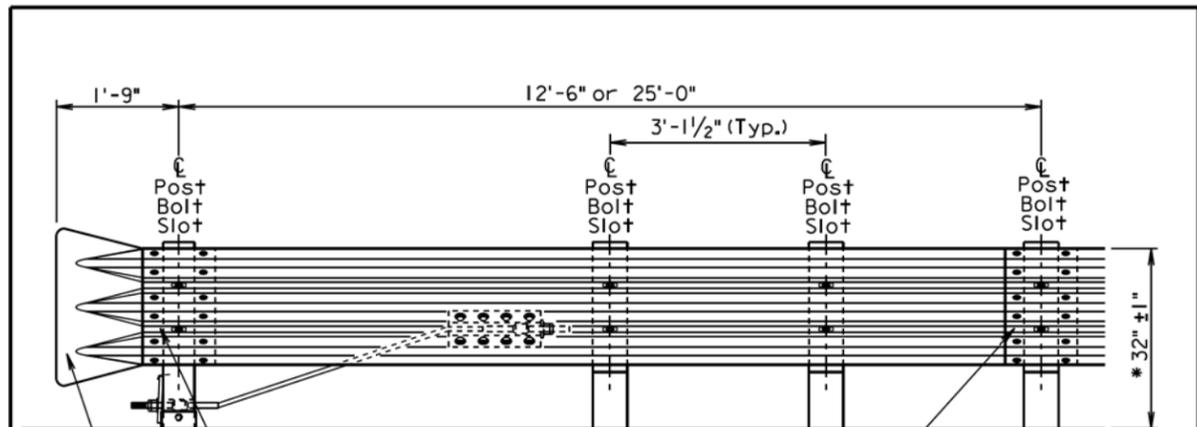
The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).

The top of post and top of block shall have a true square cut. The top of block shall be ±1 inch from the top of the post.

June 26, 2015

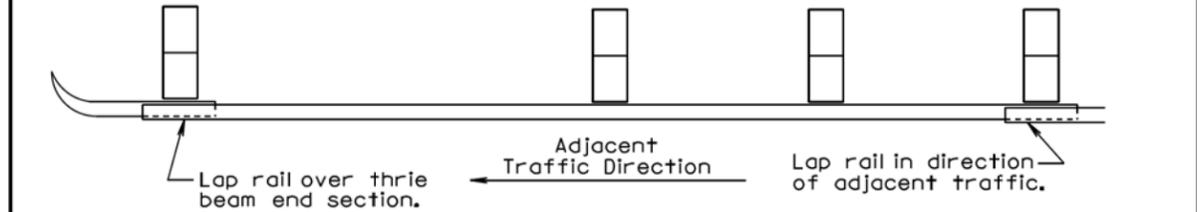
S D D O T	THRIE BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.01
		Sheet 1 of 1

Published Date: 3rd Qtr. 2015



ELEVATION

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



PLAN

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

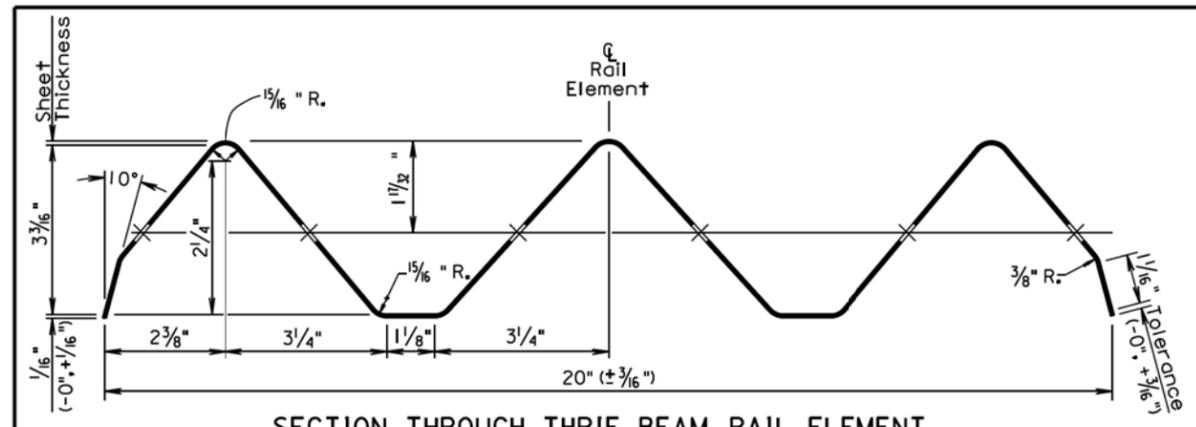
For Informational Purposes Only

GENERAL NOTES:

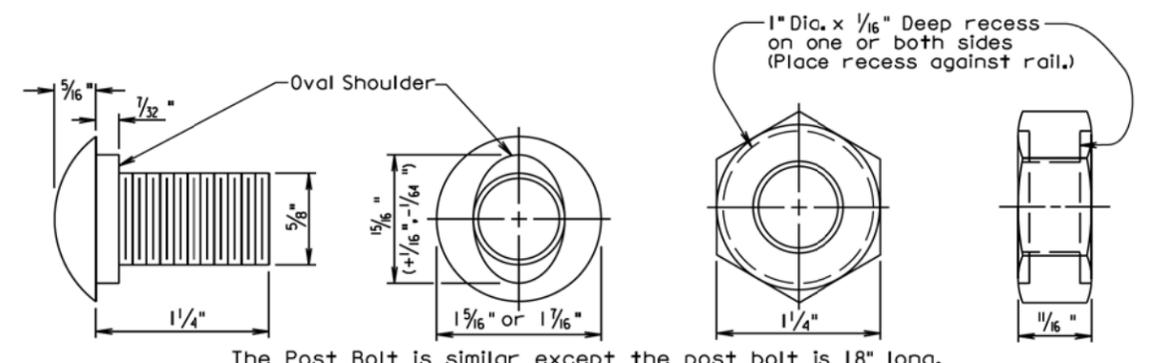
- All thrie beam rail shall be Type 1.
- There will be no separate payment for furnishing and installing Thrie Beam End Sections (Flared) and Thrie Beam Terminal Connectors. All costs for the Thrie Beam End Sections (Flared) and Thrie Beam Terminal Connectors shall be incidental to the contract unit 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.

June 26, 2015

S D D O T	THRIE BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.02
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1

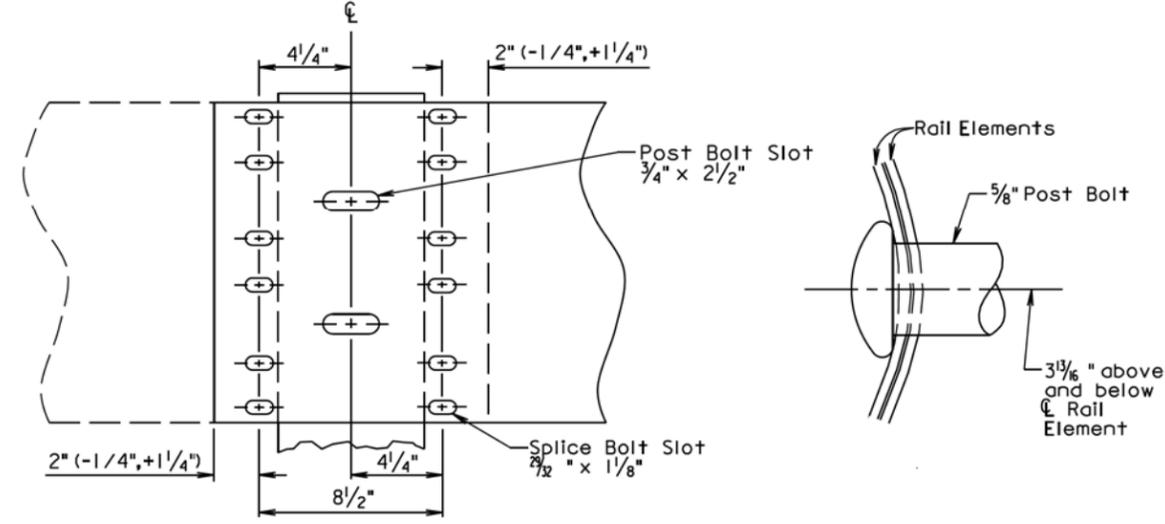


SECTION THROUGH THRIE BEAM RAIL ELEMENT



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

S D D O T	THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.03
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1

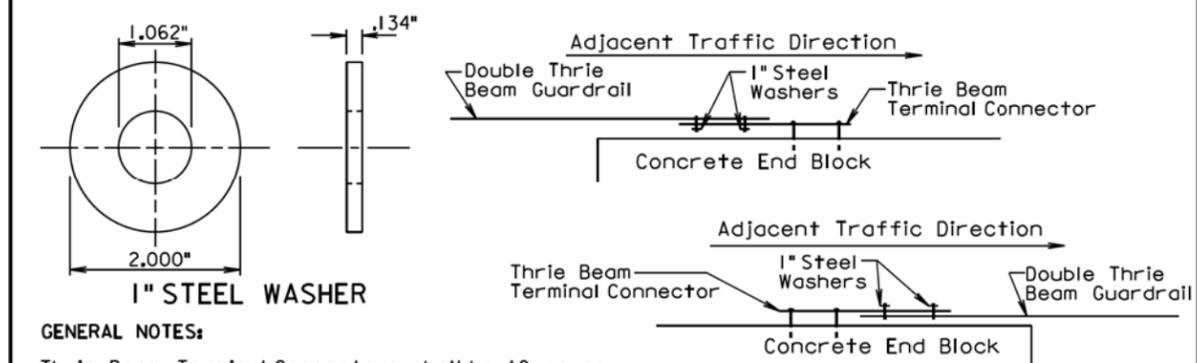
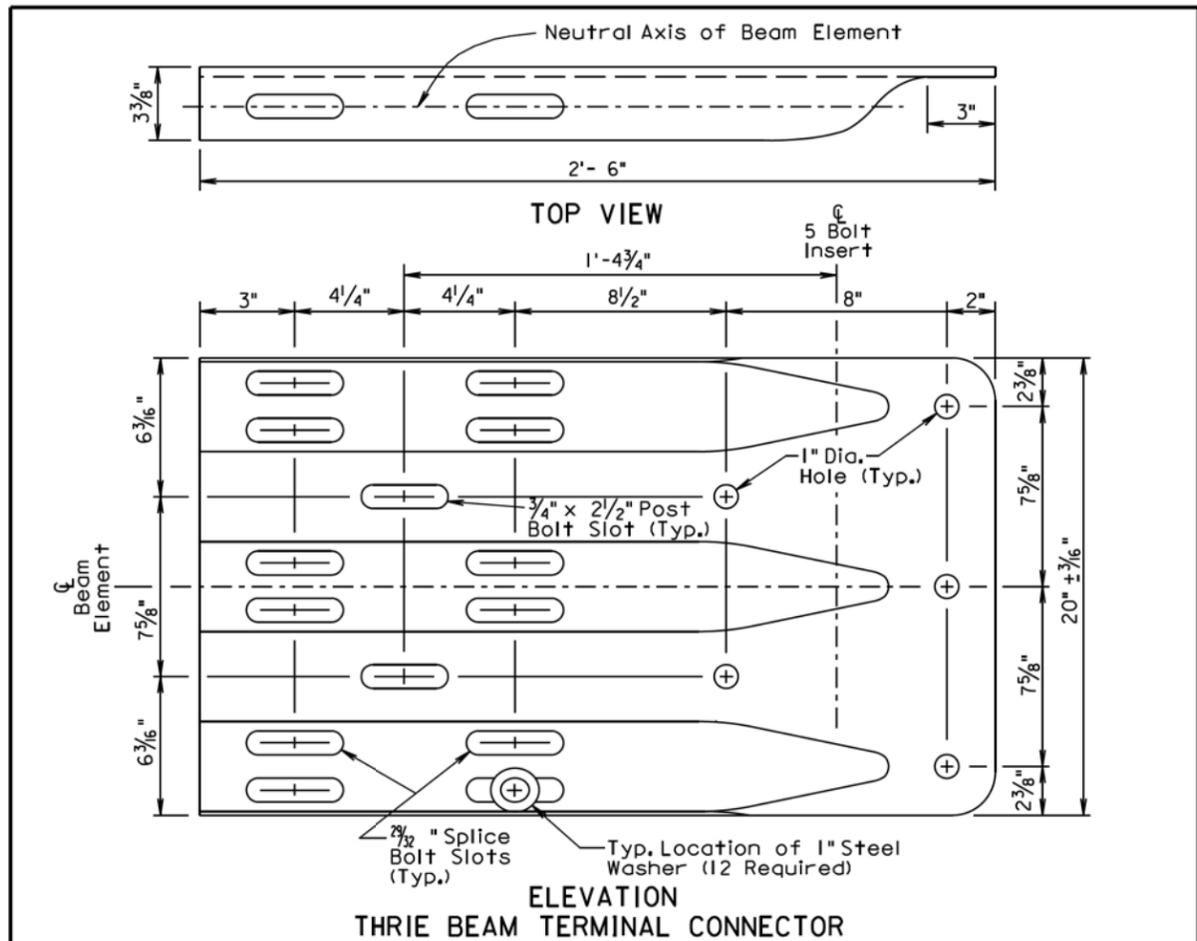
Plot Scale - 1:200

- Plotted From - ttrc11610

File - ...app\Penn037\StdPlatePg2.dgn

Plotting Date: 08/06/2015

Plot Scale - 1:200



GENERAL NOTES:

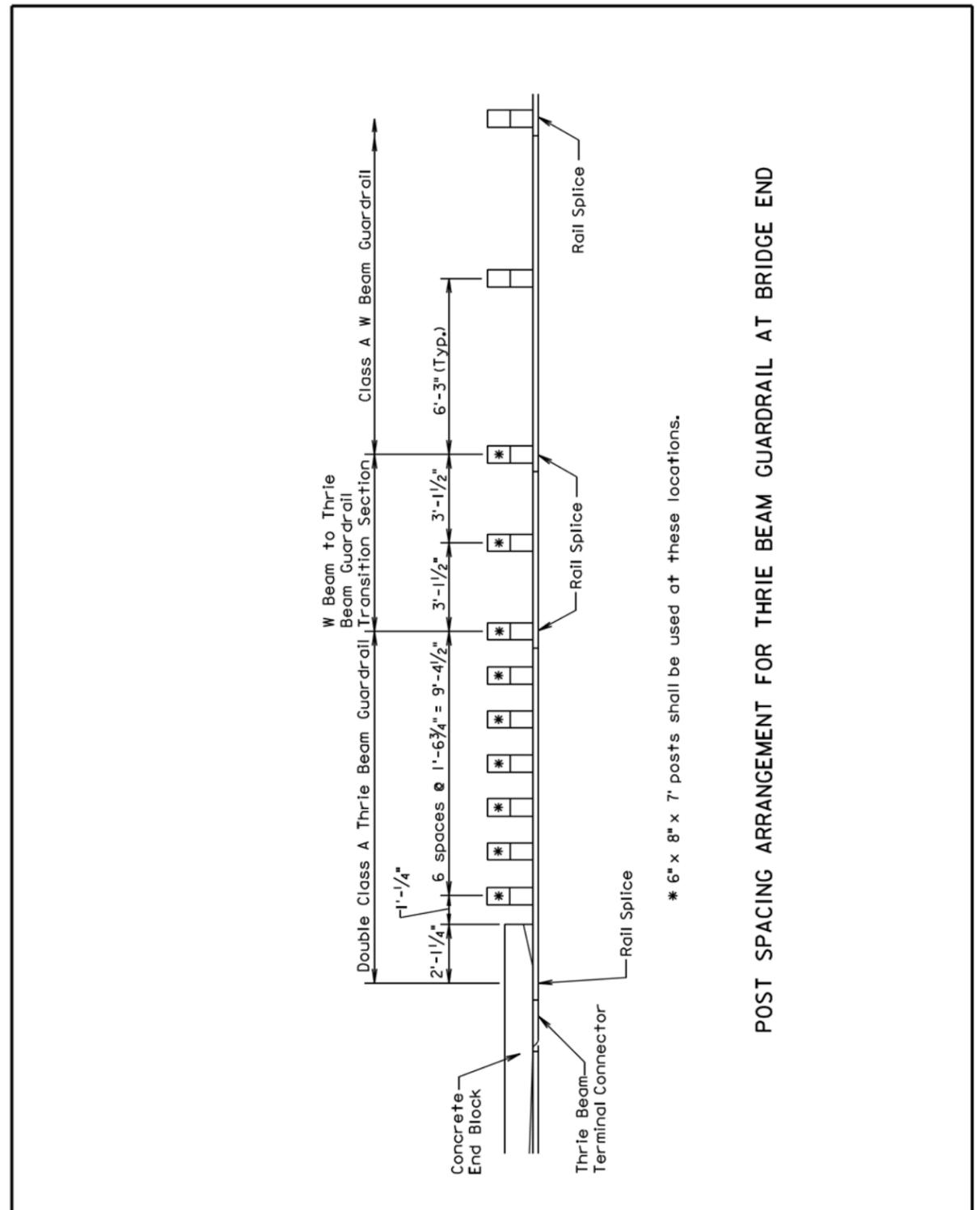
Thrie Beam Terminal Connectors shall be 10 gauge.

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

S D D O T	THRIE BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER	PLATE NUMBER 630.05
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1



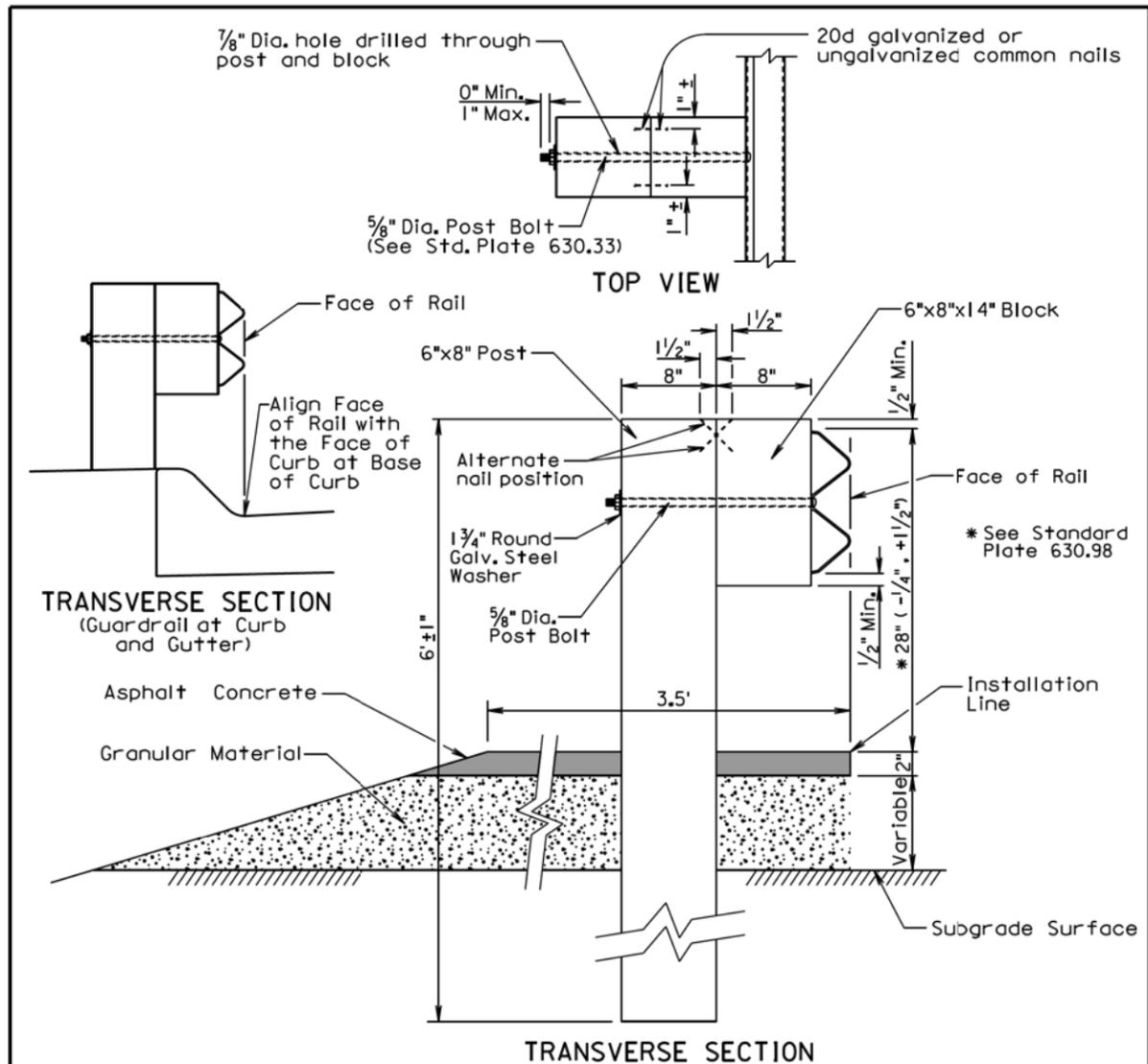
* 6" x 8" x 7" posts shall be used at these locations.

December 23, 2002

S D D O T	POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END	PLATE NUMBER 630.15
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1

- Plotted From - trc11610

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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 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.

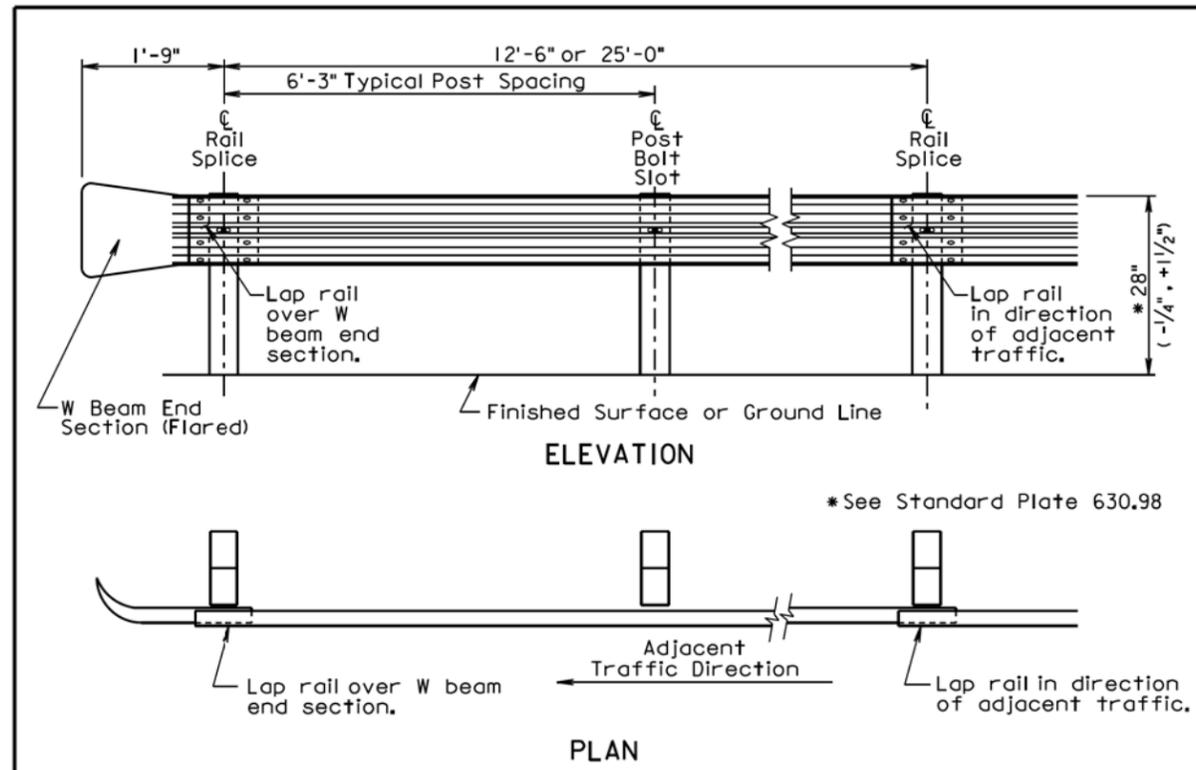
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline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

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 post and top of block shall have a true square cut. The top of block shall be ±1 inch from the top of the post.

June 26, 2015

S D D O T	W BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.31
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1



* See Standard Plate 630.98

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.

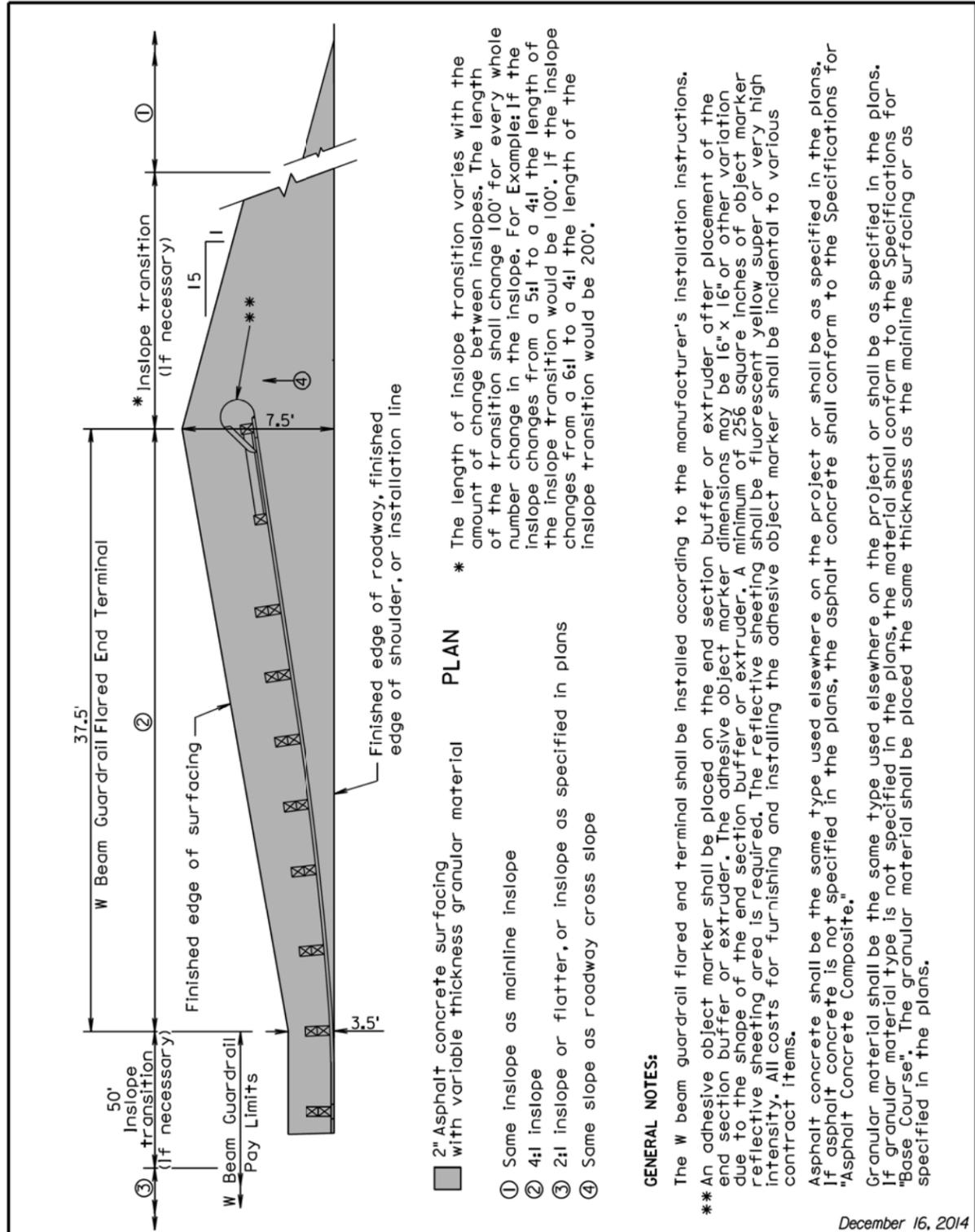
June 26, 2015

S D D O T	W BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.32
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1

Plot Scale - 1:200

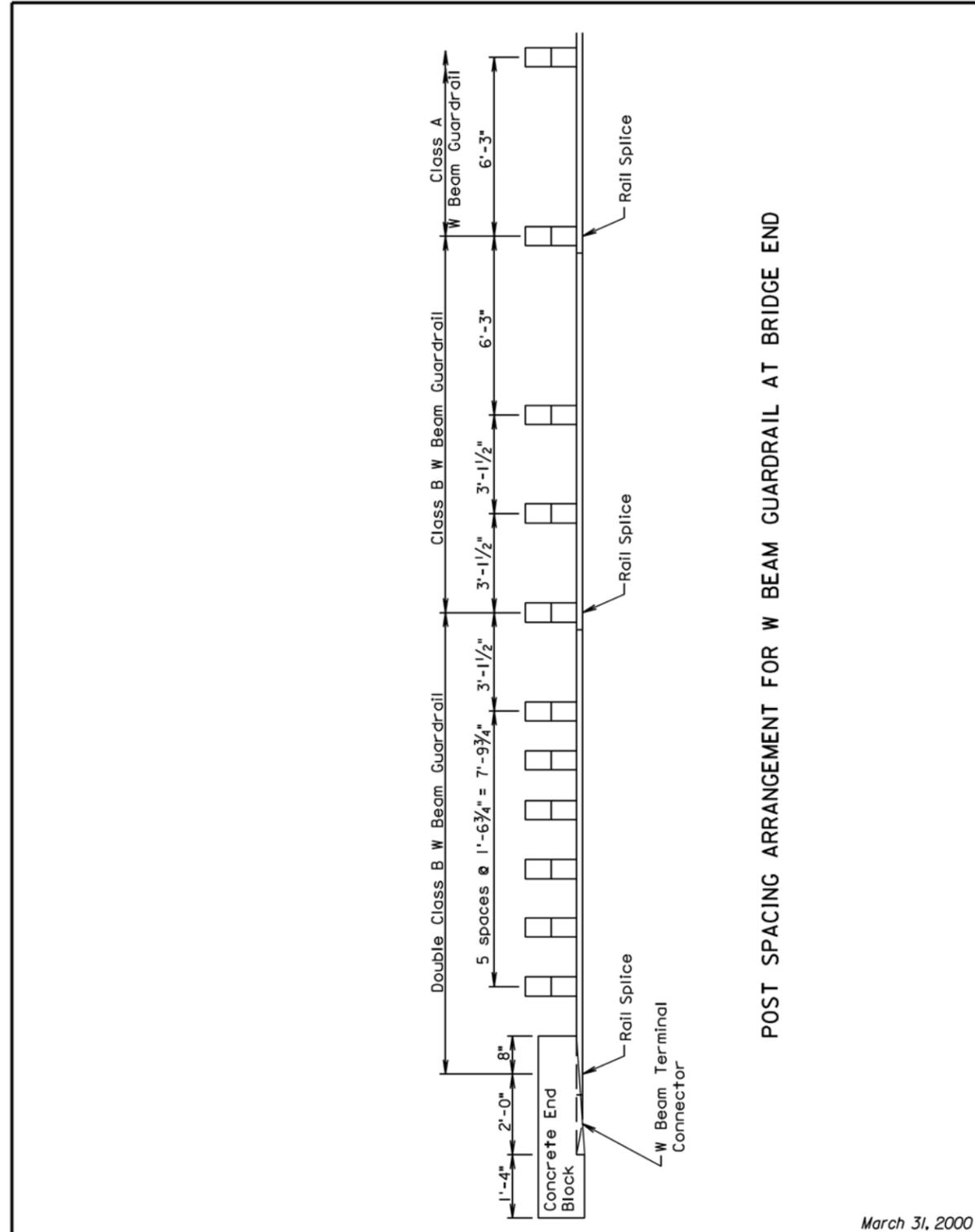
- Plotted From - trc11610

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December 16, 2014

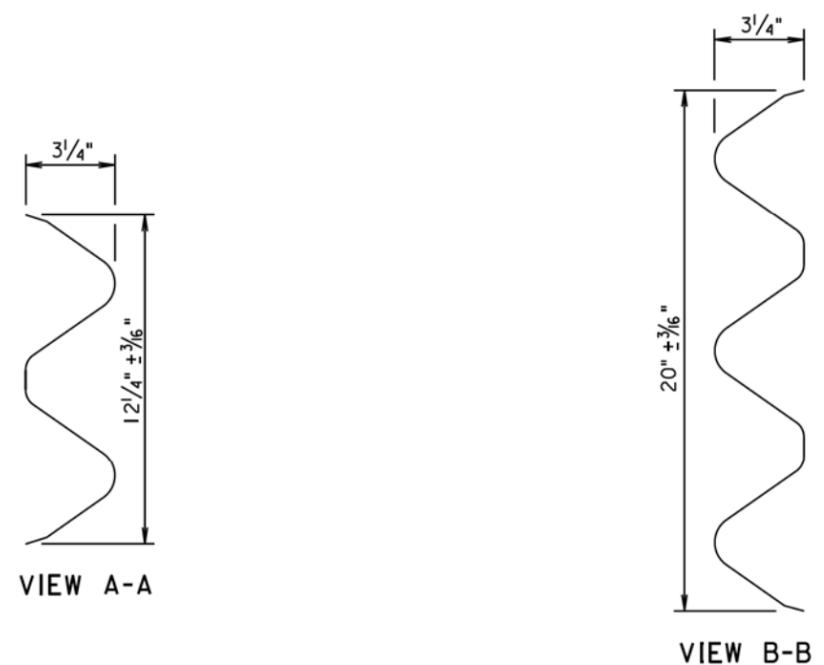
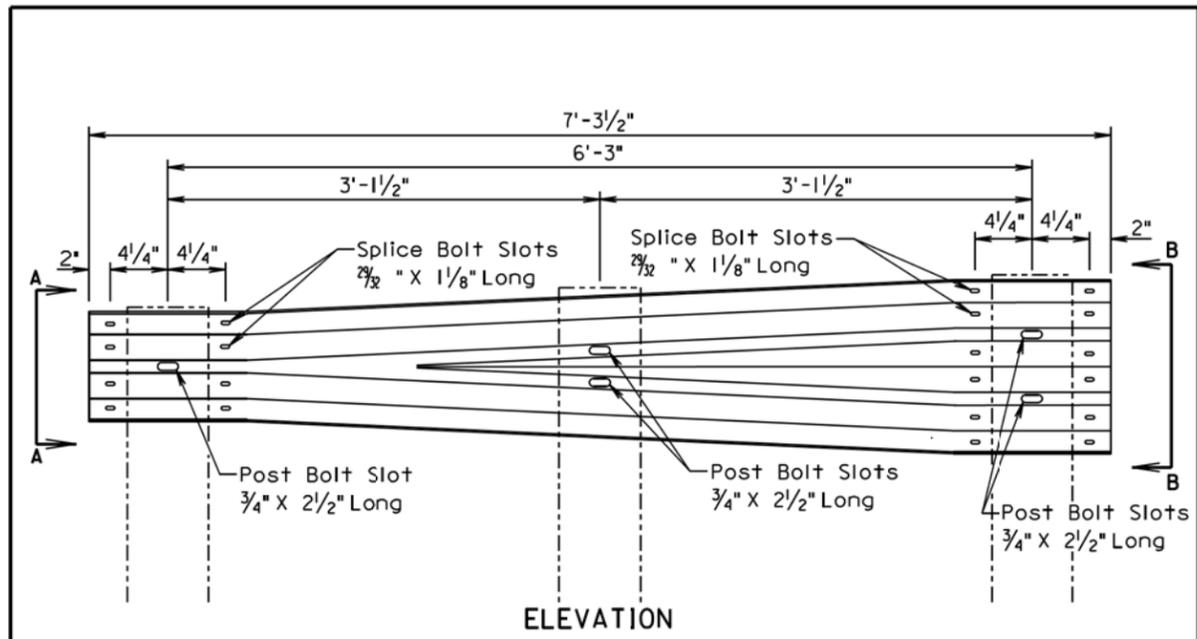
<p>Published Date: 3rd Qtr. 2015</p>	<p>S D D O T</p>	<p>EMBANKMENT AND SURFACING FOR W BEAM GUARDRAIL FLARED END TERMINAL</p>	
		<p>PLATE NUMBER 630.45</p>	<p>Sheet 1 of 1</p>



March 31, 2000

<p>Published Date: 3rd Qtr. 2015</p>	<p>S D D O T</p>	<p>POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END</p>	
		<p>PLATE NUMBER 630.50</p>	<p>Sheet 1 of 1</p>

Plotting Date: 08/06/2015

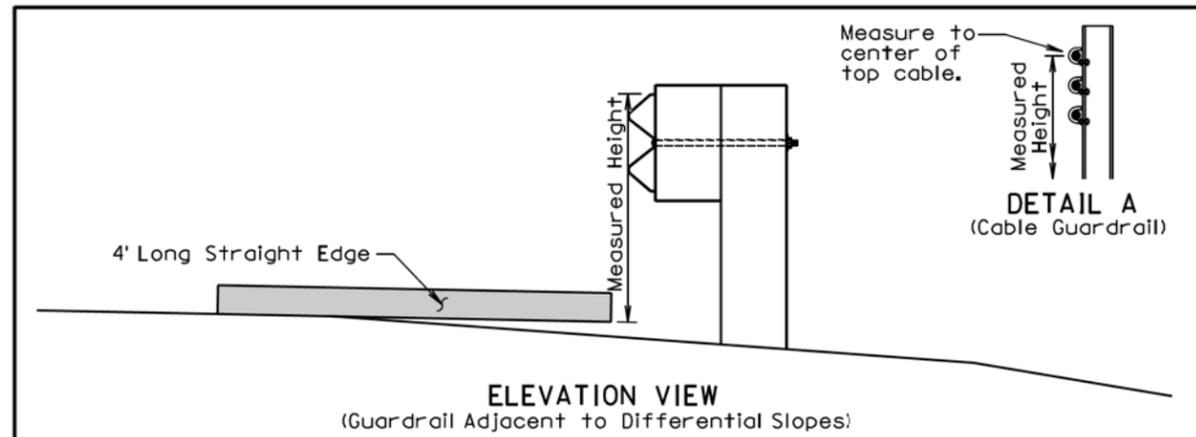


GENERAL NOTE:
All costs for constructing the W Beam to Thrie Beam Guardrail Transition including labor, equipment, and materials including two posts, two blocks, W beam to thrie beam transition section, and hardware shall be incidental to the contract unit price per each for "W Beam to Thrie Beam Guardrail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

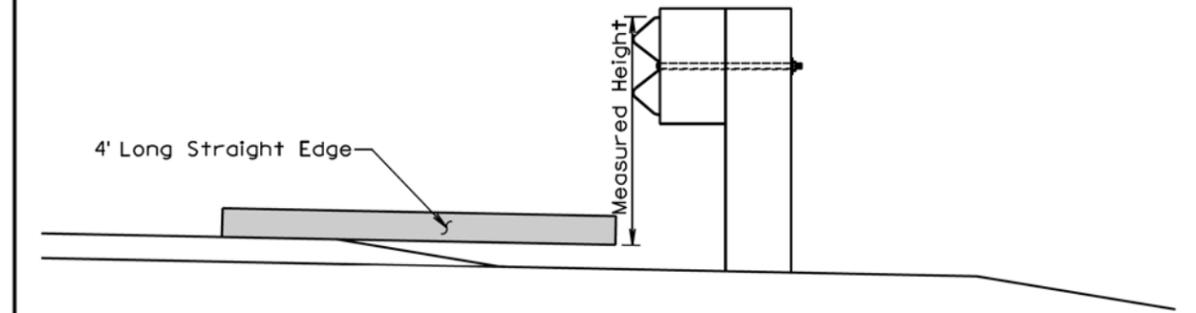
March 31, 2000

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

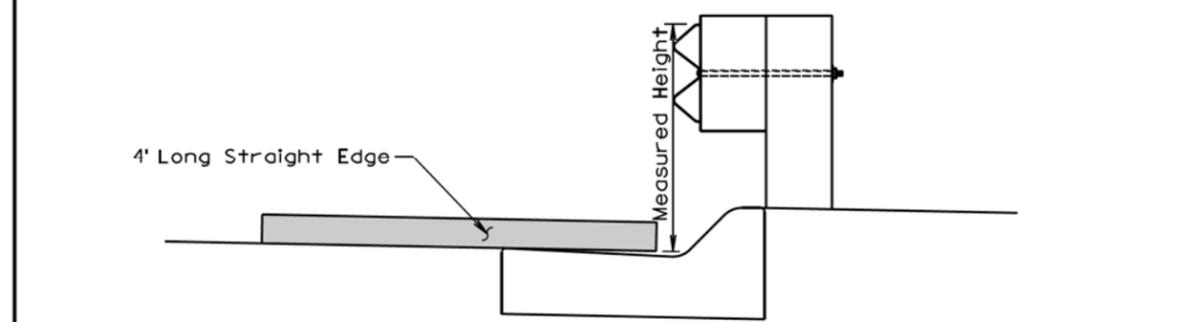
Published Date: 3rd Qtr. 2015



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

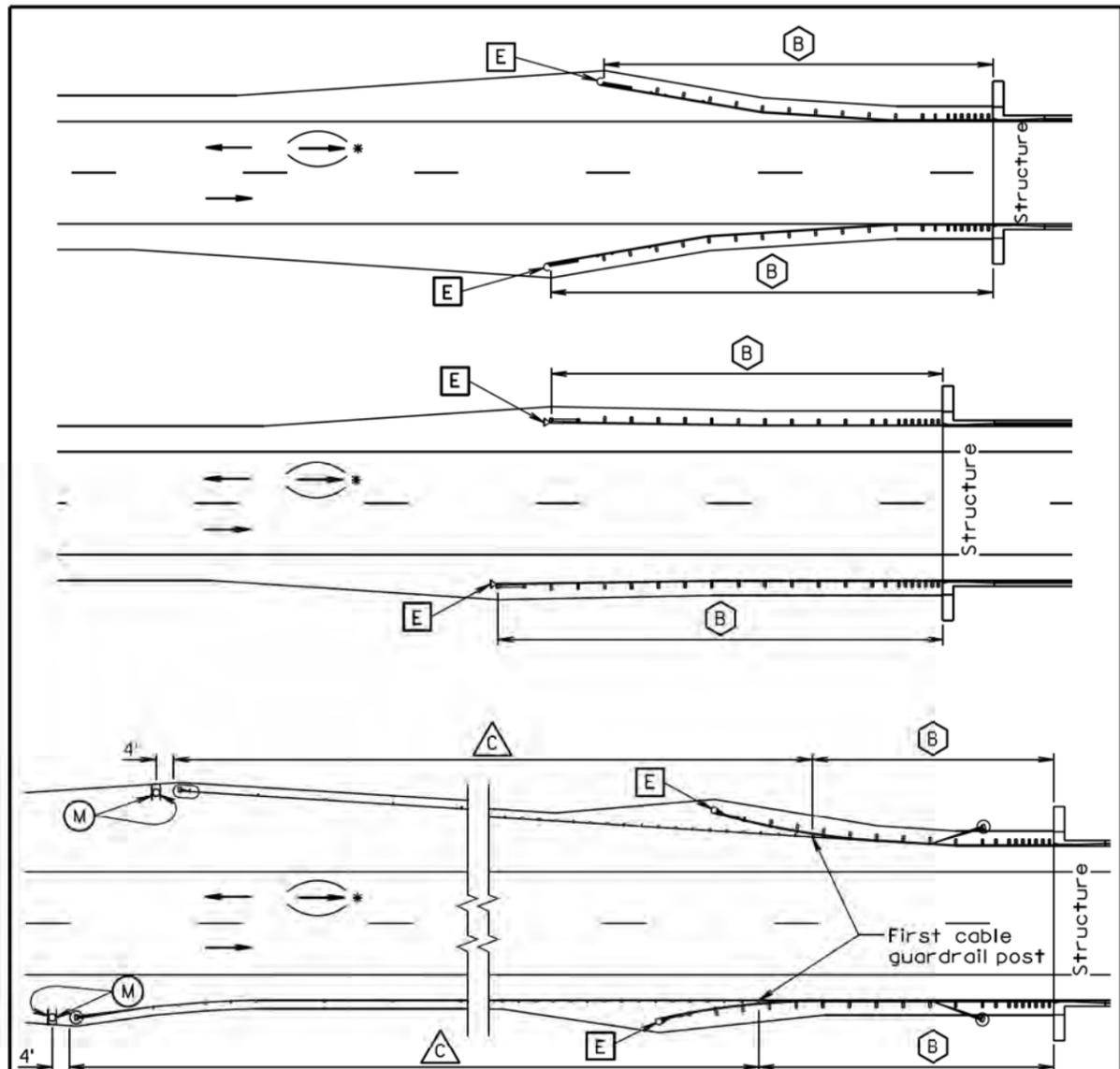
S D D O T	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.98
		Sheet 1 of 1

Published Date: 3rd Qtr. 2015

Plot Scale - 1:200

- Plotted From - tnc11610

File - ...app\Penn037\StdPlatePg7.dgn



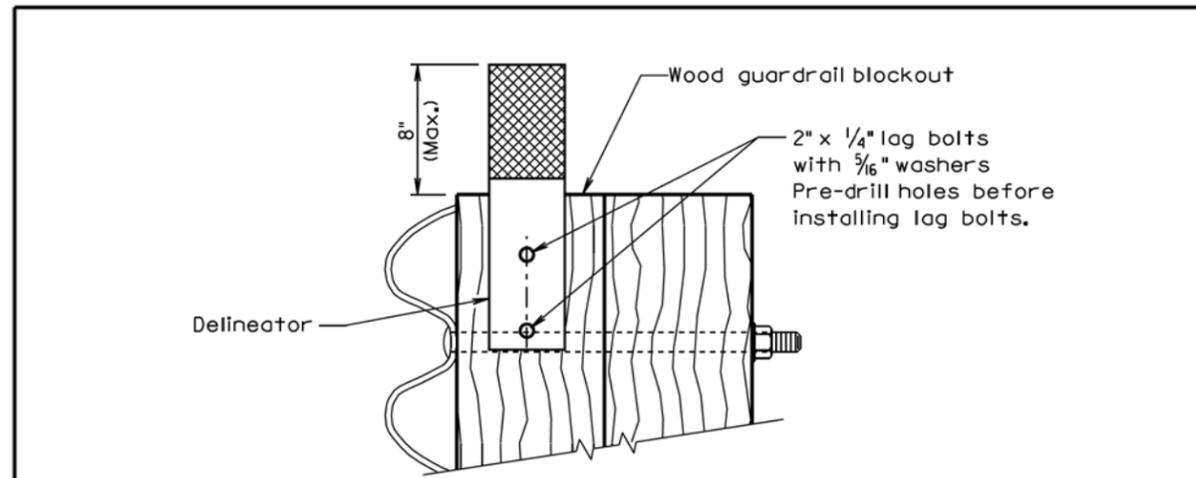
TYPICAL GUARDRAIL LAYOUTS

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

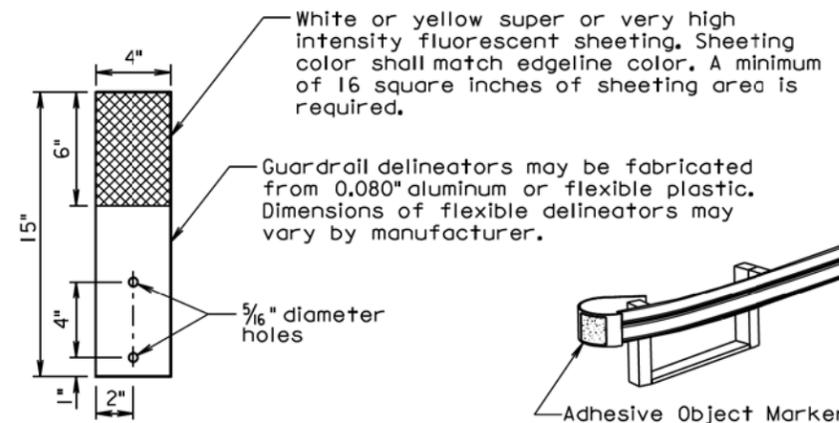
*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 26, 2011

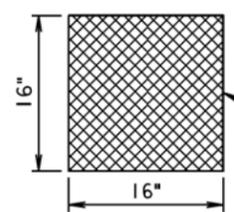
S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
	Published Date: 3rd Qtr. 2015	Sheet 1 of 4



B STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



ADHESIVE OBJECT MARKER

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

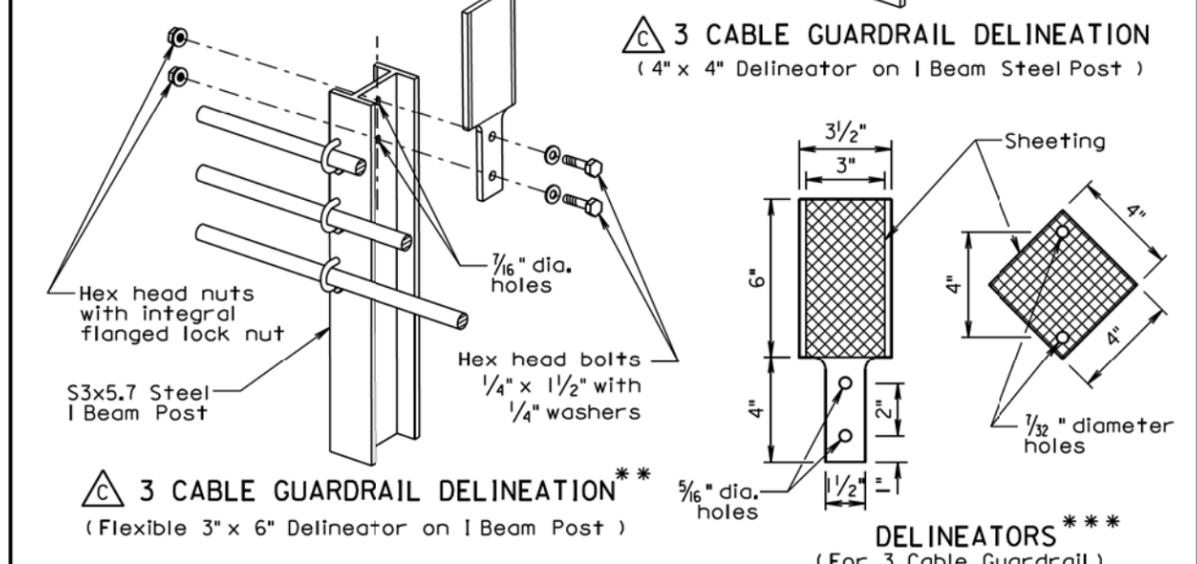
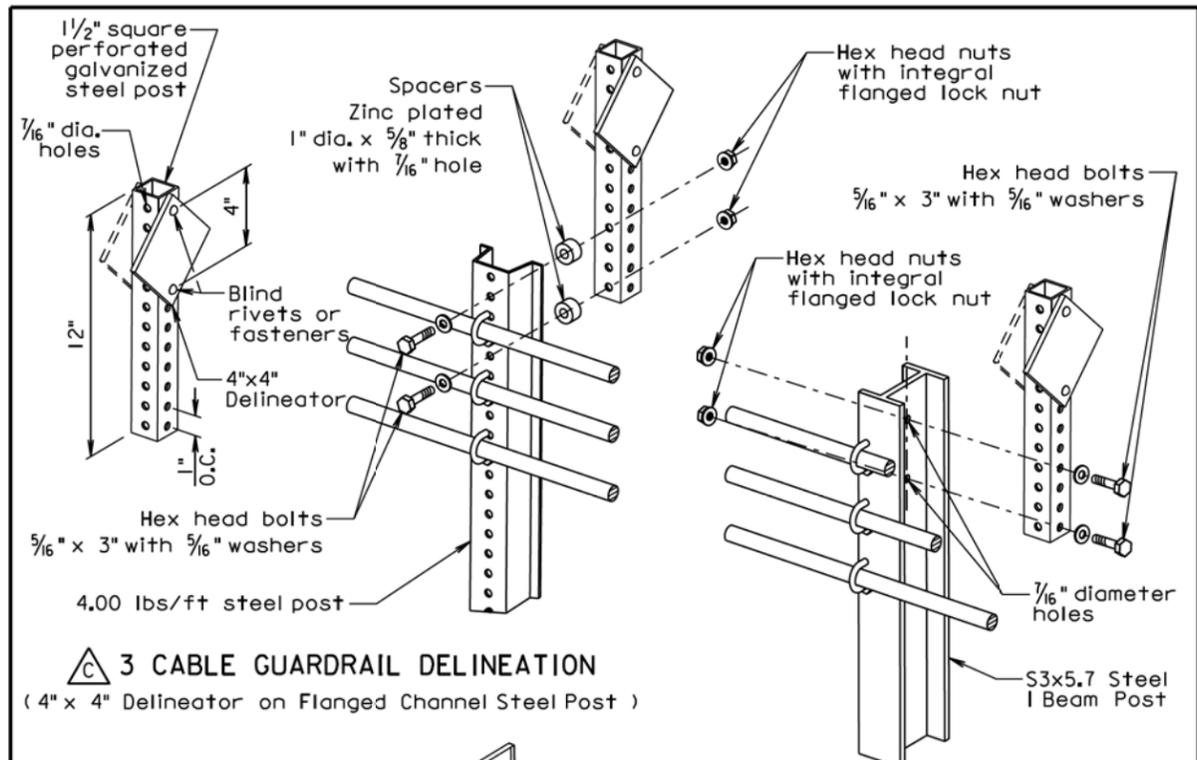
June 26, 2011

S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
	Published Date: 3rd Qtr. 2015	Sheet 2 of 4

Plot Scale - 1:200

- Plotted From - trc11610

File - ...ppj\penn037\StdPlatePg8.dgn

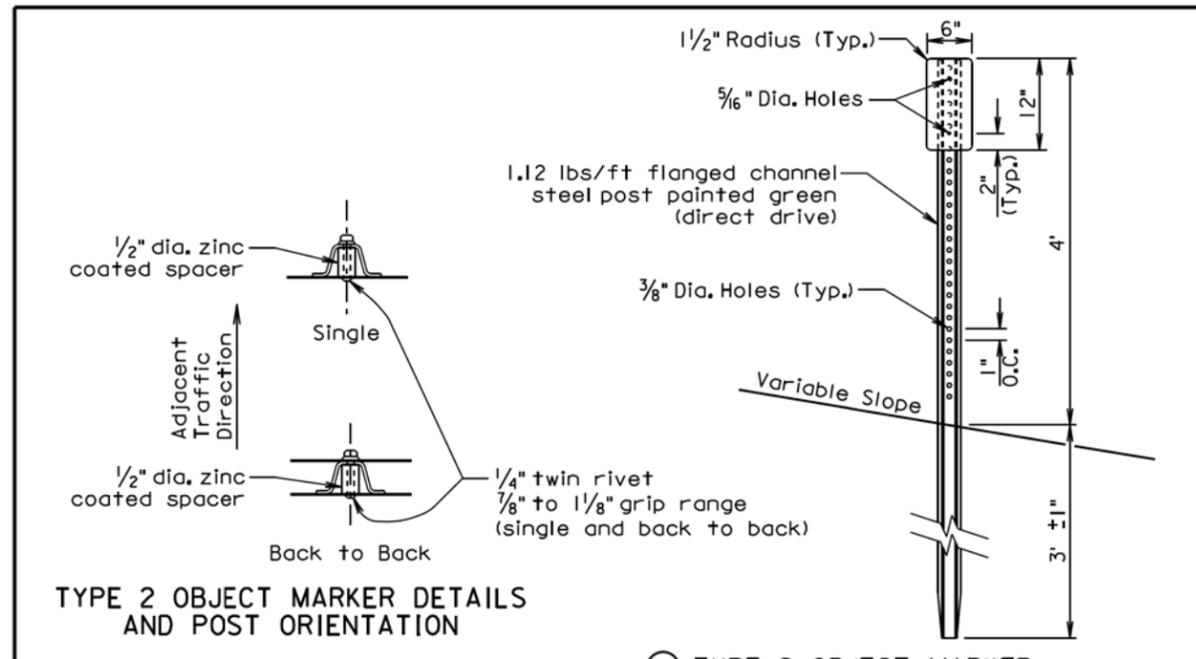


C 3 CABLE GUARDRAIL DELINEATION**
(Flexible 3" x 6" Delineator on I Beam Post)

** 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



TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION

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

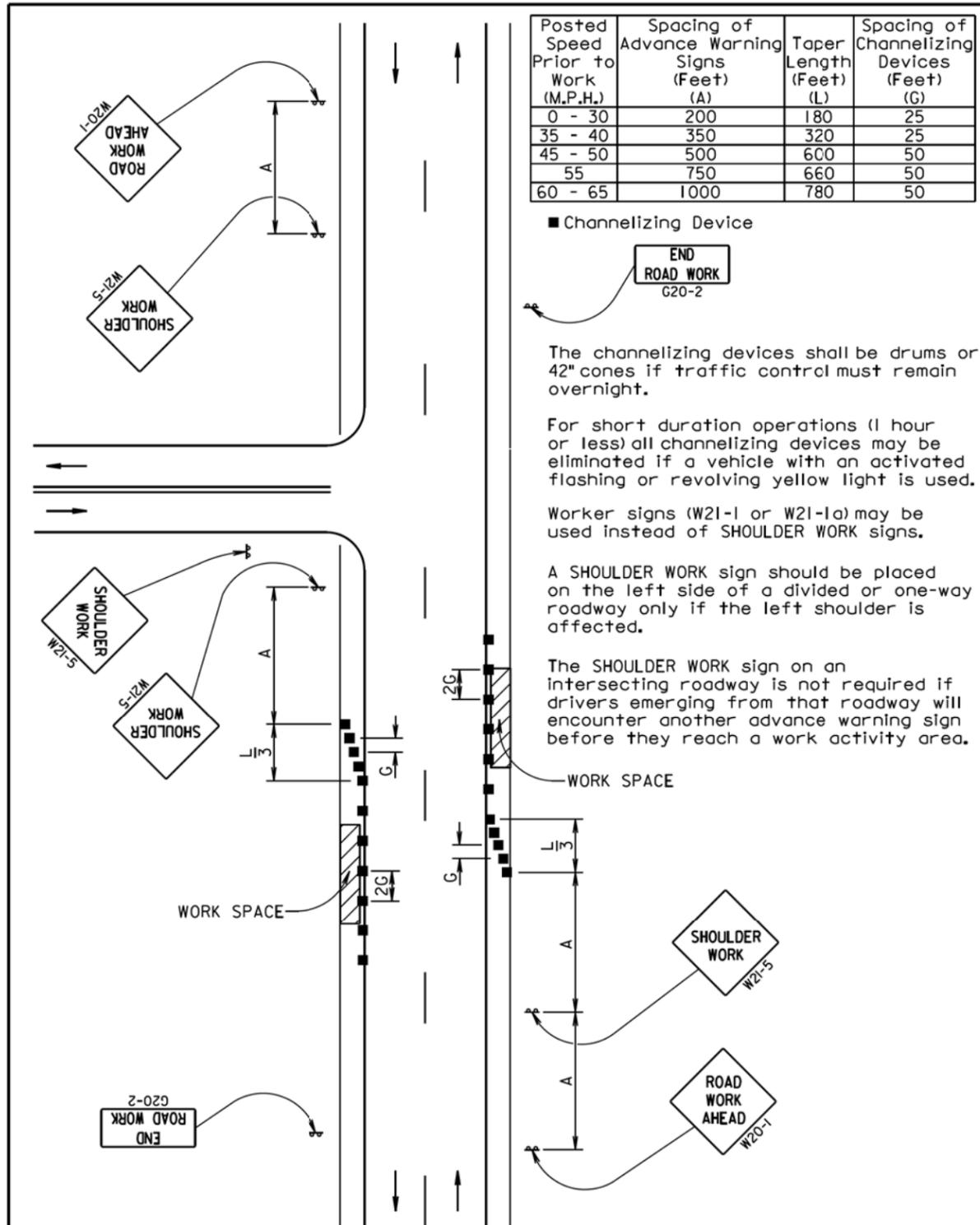
S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
	Published Date: 3rd Qtr. 2015	Sheet 3 of 4

S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
	Published Date: 3rd Qtr. 2015	Sheet 4 of 4

1:200 Plot Scale - trc:11610 - Plotted From -

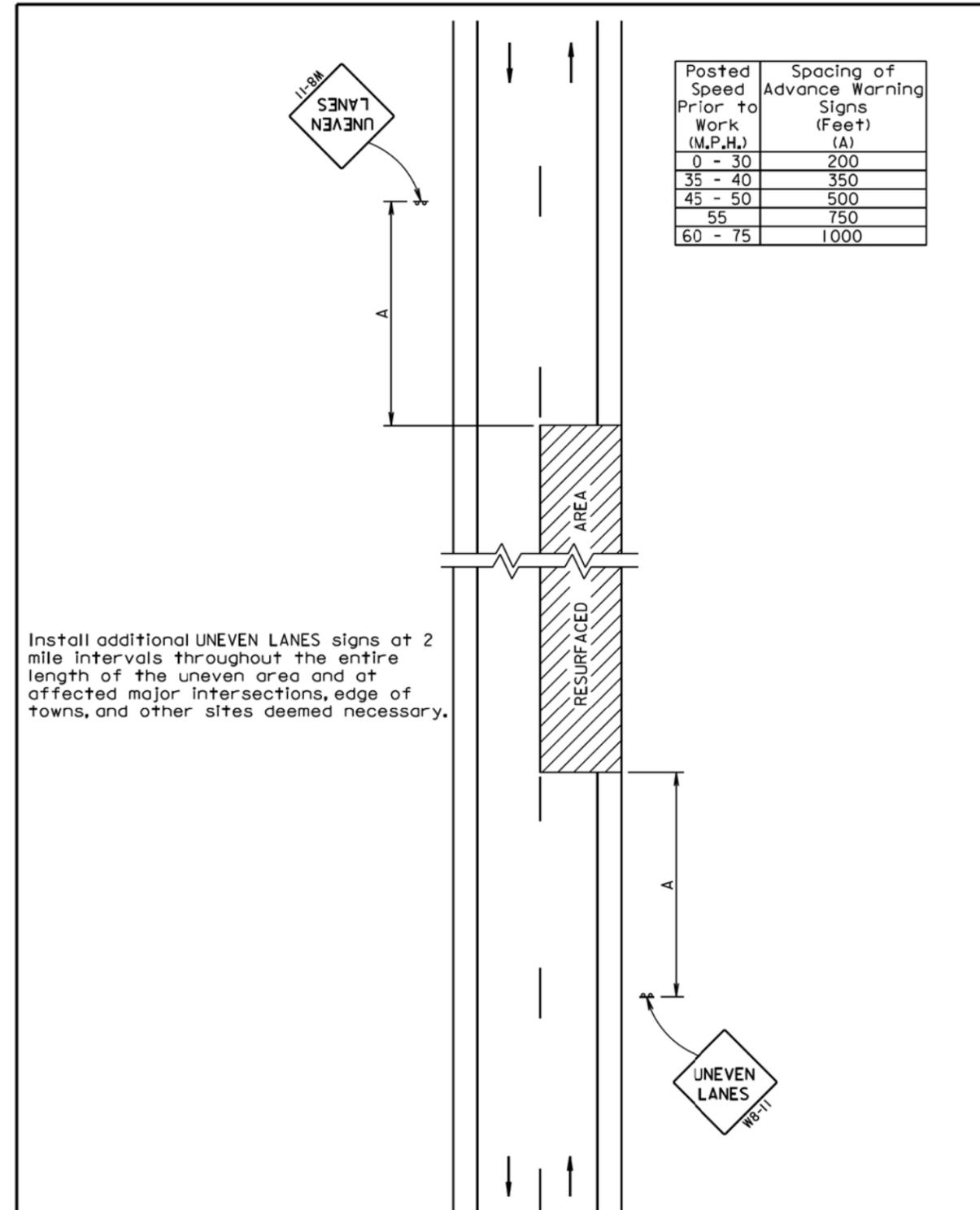
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Plot Scale - 1:200



September 22, 2014

S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS	PLATE NUMBER 634.03
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1



April 15, 2015

S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES UNEVEN ROAD SURFACE	PLATE NUMBER 634.22
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1

Plotted From - trc11610

File - ...apj\Penn037\StdPlatePg10.dgn

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

- Flagger
- Channelizing Device

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

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

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

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

The channelizing devices shall be drums or 42" cones.

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

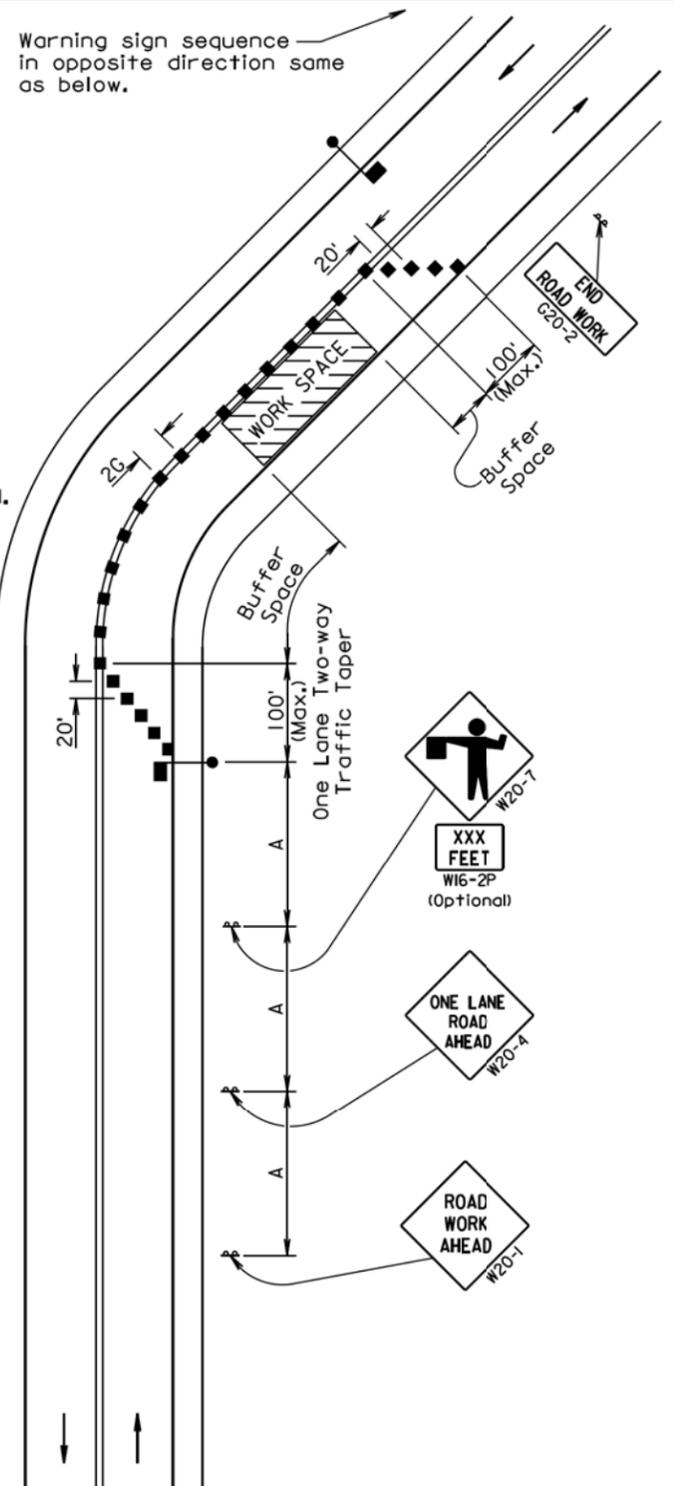
END ROAD WORK G20-2

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

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

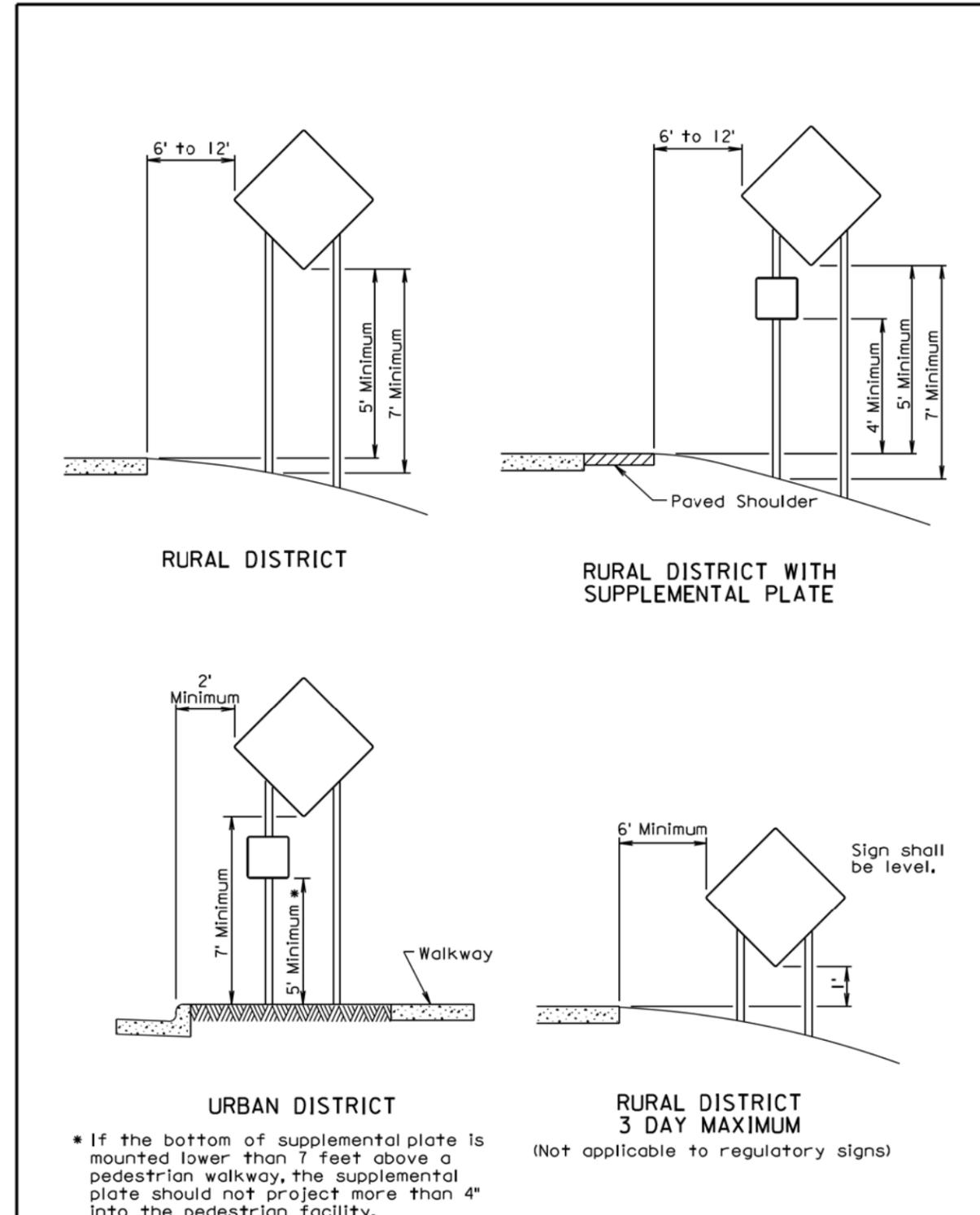
The length of A may be adjusted to fit field conditions.

Warning sign sequence in opposite direction same as below.



September 22, 2014

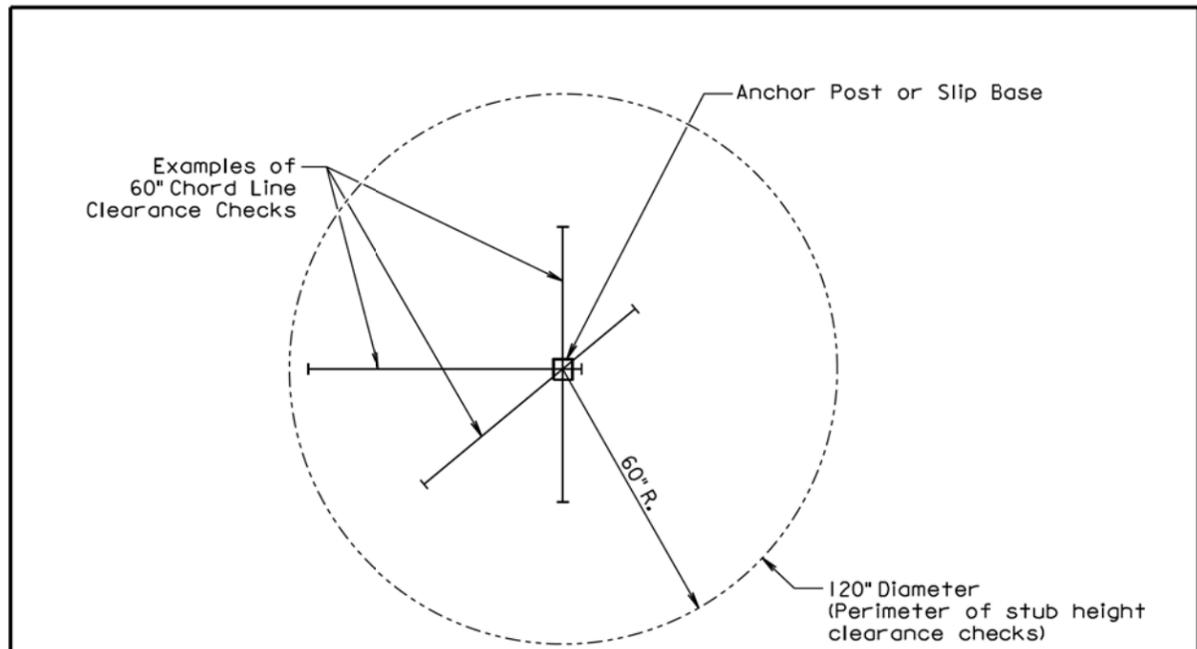
S D D O T	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1



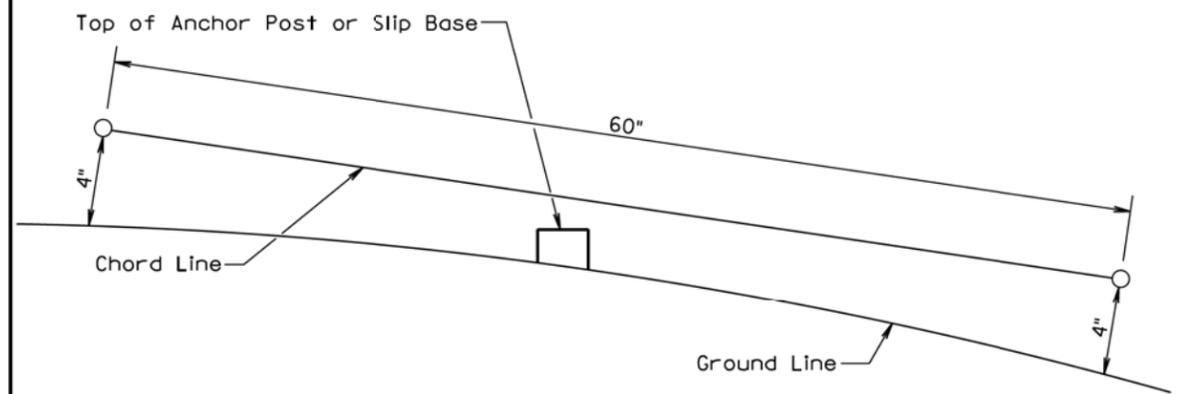
September 22, 2014

S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
	Published Date: 3rd Qtr. 2015	Sheet 1 of 1

Plot Scale - 1:200



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.

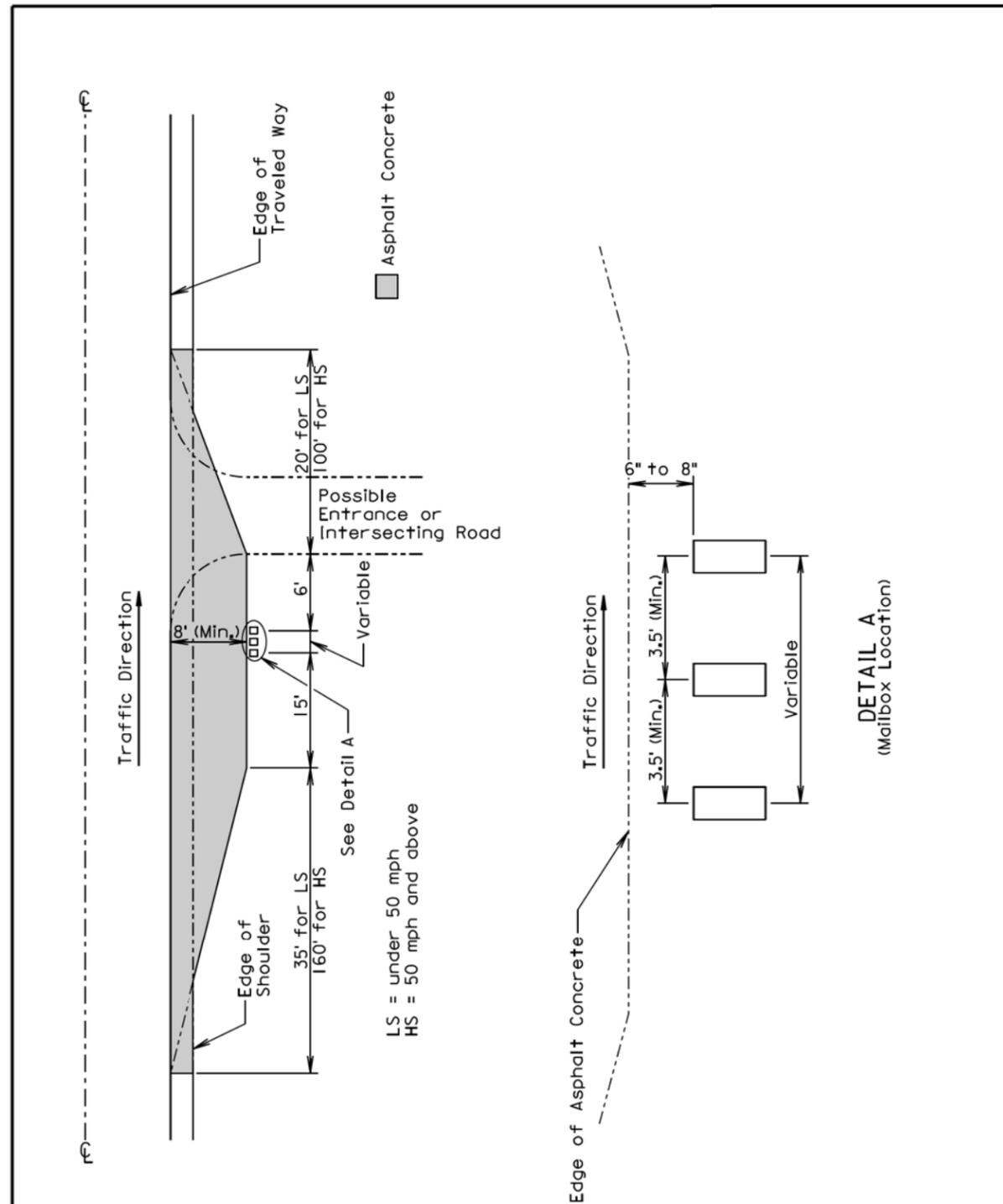
At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

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

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

Published Date: 3rd Qtr. 2015



See Detail A
LS = under 50 mph
HS = 50 mph and above

August 31, 2013

S D D O T	MAILBOX TURNOUT	PLATE NUMBER 900.01
		Sheet 1 of 1

Published Date: 3rd Qtr. 2015

- Plotted From - tncs11610

File - ...app\Penn037\StdPlatePg12.dgn

