Plot Scale - 1:200
Plotted From - trrc11610

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	1	45

Plotting Date: 11/07/2016 Revised 10-3-16 klh

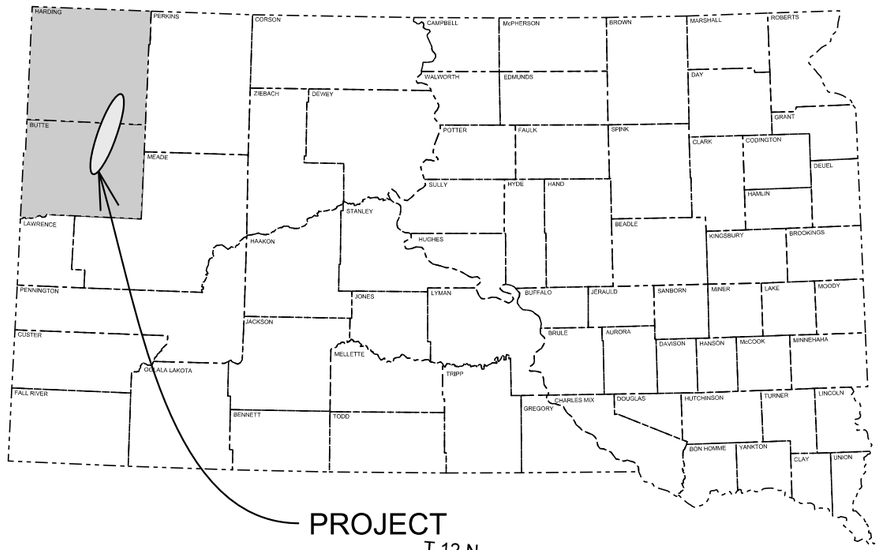
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

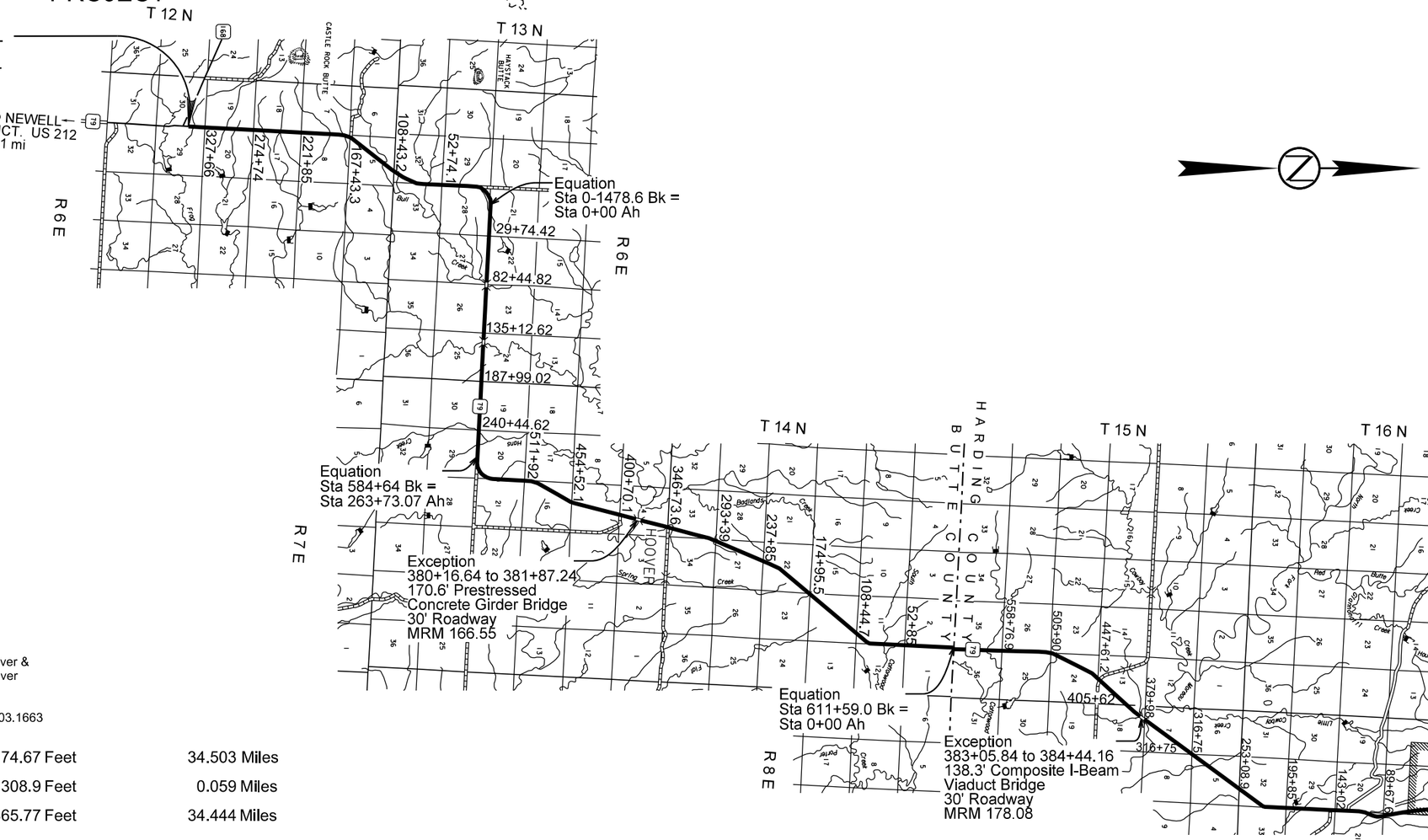
PLANS FOR PROPOSED

PROJECT P 0079(77)150
SD HIGHWAY 79
HARDING & BUTTE COUNTIES

COLD MILL ASPHALT CONCRETE &
ASPHALT CONCRETE RESURFACING
PCN 05P7

INDEX OF SHEETS





DESIGN DESIGNATION

ADT (2015)	446
ADT (2035)	512
DHV	80
D	50 %
T DHV	12.2 %
T ADT	26.7 %
V	65 mph

STORM WATER PERMIT

Major Receiving
Body of Water: North Fork Moreau River &
South Fork Moreau River
Area Disturbed: 76 Acre
Total Project Area: 163.5 Acre
Approx. Begin Lat, Long: 45.3669, -103.1663

Gross Length	182,174.67 Feet	34.503 Miles
Length of Exceptions	308.9 Feet	0.059 Miles
Net Length	181,865.77 Feet	34.444 Miles

4

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ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	2	45

Revised: 10-13-16 klh

Estimate of Quantities

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E3320	Checker	Lump Sum	LS
110E1010	Remove Asphalt Concrete Pavement	1,354.0	SqYd
110E4330	Salvage W Beam Guardrail	75.0	Ft
110E4380	Salvage W Beam Guardrail Tangent End Terminal	4	Each
110E6200	Remove Double Thrie Beam Guardrail for Reset	50.0	Ft
110E6220	Remove Double W Beam Guardrail for Reset	100.0	Ft
110E6230	Remove W Beam Guardrail for Reset	325.0	Ft
110E6240	Remove W Beam to Thrie Beam Guardrail Transition for Reset	4	Each
110E6270	Remove W Beam Guardrail Flared End Terminal for Reset	4	Each
110E6300	Remove Rubrail for Reset	50.0	Ft
120E0010	Unclassified Excavation	414	CuYd
120E0100	Unclassified Excavation, Digouts	1,726	CuYd
120E0600	Contractor Furnished Borrow Excavation	3,955	CuYd
120E6200	Water for Granular Material	133.0	MGal
230E0020	Contractor Furnished Topsoil	7,513	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
320E7008	Grind 8" Rumble Strip or Stripe in Asphalt Concrete	69.0	Mile
330E0010	MC-70 Asphalt for Prime	58.0	Ton
330E0100	SS-1h or CSS-1h Asphalt for Tack	259.8	Ton
330E0210	SS-1h or CSS-1h Asphalt for Flush Seal	128.5	Ton
330E2000	Sand for Flush Seal	1,778.7	Ton
332E0010	Cold Milling Asphalt Concrete	352,429	SqYd
332E0110	Cold Milling Asphalt Concrete and Placing Cold Milled Material	10,979.0	Ton
430E0700	Precast Concrete Headwall for Drain	8	Each
600E0300	Type III Field Laboratory	1	Each
630E1010	Straight Class A W Beam Guardrail with Wood Posts	375.0	Ft
630E2015	W Beam Guardrail Flared End Terminal	4	Each
630E2110	Beam Guardrail Post and Block	168	Each
630E5130	Reset Double Thrie Beam Rail	50.0	Ft
630E5160	Reset W Beam Rail	325.0	Ft
630E5170	Reset Double W Beam Rail	100.0	Ft
630E5190	Reset W Beam to Thrie Beam Guardrail Transition	4	Each
630E5207	Reset W Beam Guardrail Flared End Terminal	4	Each
630E5220	Reset Rubrail	50.0	Ft
632E2220	Guardrail Delineator	32	Each
633E1200	Waterborne Pavement Marking Paint with High Grade Polymer, White	1,920	Gal
633E1205	Waterborne Pavement Marking Paint with High Grade Polymer,Yellow	1,440	Gal
634E0010	Flagging	1,725.0	Hour
634E0020	Pilot Car	865.0	Hour
634E0110	Traffic Control Signs	704.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0630	Temporary Pavement Marking	103.5	Mile
634E1002	Detour Signing	344.0	SqFt
680E0240	4" Corrugated Polyethylene Drainage Tubing	80	Ft
730E0210	Type F Permanent Seed Mixture	1,976	Lb
731E0200	Fertilizing	57.50	Ton
732E0100	Mulching	152.0	Ton
831E0300	Reinforcement Fabric (MSE)	1,356	SqYd
900E0010	Refurbish Single Mailbox	6	Each
900E0012	Refurbish Double Mailbox	2	Each

Alternate A Quantities

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
260E1010	Base Course	5,238.0	Ton
260E1050	Base Course, Salvaged Asphalt Mix	2,282.0	Ton
320E0005	PG 58-34 Asphalt Binder	3,661.6	Ton
320E1202	Class Q2R Hot Mixed Asphalt Concrete	78,614.8	Ton
320E4000	Hydrated Lime	791.7	Ton

Alternate B Quantities

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
260E1010	Base Course	5,676.0	Ton
260E1050	Base Course, Salvaged Asphalt Mix	1,844.0	Ton
320E0005	PG 58-34 Asphalt Binder	3,361.0	Ton
320E1202	Class Q2R Hot Mixed Asphalt Concrete	80,596.0	Ton
320E4000	Hydrated Lime	799.8	Ton

SPECIFICATIONS

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

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	3	45

Revised: 10-13-16 klh

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 1 acre or more of earth disturbance.

Action Taken/Required:

The DENR and the US Environmental Protection Agency (EPA) have issued separate general permits for the discharge of storm water runoff. The DENR permit applies to discharges on state land and the EPA permit applies to discharges on federal or reservation land. The Contractor is advised this project is regulated under the Phase II Storm Water Regulations and must receive coverage under the General Permit for Construction Activities. A Notice of Intent (NOI) will be submitted to DENR a minimum of 15 days prior to project start by the DOT Environmental Office. A letter must be received from DENR that acknowledges project coverage under this general permit before project start. The Contractor is advised that permit coverage may also be required by off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

The Contractor shall adhere to the "Special Provision Regarding Storm Water Discharges to Waters of the State".

A major component of the storm water construction permits is development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is a joint effort and responsibility of the SDDOT and the Contractor. Erosion control measures and best management practices will be implemented in accordance with the SWPPP. The SWPPP is a dynamic document and is to be available on-site at all times.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT:
http://www.sddot.com/business/environmental/stormwater/Default.aspx

DENR: http://www.denr.sd.gov/des/sw/stormwater.aspx

EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Contractor Certification Form:

The "Department of Environmental and Natural Resources – Contractor Certification Form" (SD EForm – 2110LDV1-ContractorCertification.pdf) shall be completed by the Contractor or their certified Erosion Control Supervisor after the award of the contract. Work may not begin on the project until this form is signed.

The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the Surface Water Discharge General Permit for Storm Water Discharges Associated with Construction Activities for the Project.

The online form can be found at:
http://denr.sd.gov/des/sw/eforms/E2110LDV1-ContractorCertification.pdf

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 Public ROW.

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

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	4	45

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ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

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 department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor 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 Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

FLEXIBLE PAVEMENT SMOOTHNESS PROVISION

All sections, not excluded by the Special Provision for Flexible Pavement Smoothness, will be evaluated as 2 opportunities.

SURFACING/SUBGRADE REPORT

A copy of the surfacing/subgrade investigation for this project is available for review at the Rapid City Region and Belle Fourche Area offices.

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.

MAINTENANCE OF APPROACHES DURING OPERATIONS

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

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.

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".

CONTRACTOR FURNISHED BORROW EXCAVATION

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.

No separate payment will be made for the Water for Embankment and all costs associated shall be incidental to the contract unit price per cubic yard of "Contractor Furnished Borrow Excavation".

Compaction of the embankment shall be to the satisfaction of the Engineer.

UNCLASSIFIED EXCAVATION, DIGOUTS

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 is 100 tons per mile of Base Course for backfilling digouts.

Base Course shall be Contractor furnished.

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

ADDITIONAL QUANTITIES

Included in the Table of Additional Quantities are:

100 tons of Class Q2R Hot Mixed Asphalt Concrete, 1.0 tons of Hydrated Lime, and 4.7 tons of PG 58-34 Asphalt Binder per mile for Alt A and 100 tons of Class Q2R Hot Mixed Asphalt Concrete, 1.0 tons of Hydrated Lime, and 4.2 tons of PG 58-34 Asphalt Binder per mile for Alt B for spot leveling, strengthening, and repair of the existing surface.

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

COLD MILLING ASPHALT CONCRETE AND PLACING COLD MILLED MATERIAL

The Los Angeles Abrasion Loss value on the aggregate used for the in place asphalt concrete was 20 percent. This value was obtained from testing during construction.

An estimated 10,979 tons Cold Milling Asphalt Concrete and Placing Cold Milled Material will be used to widen the shoulders as shown on Section 1. An additional 1,837 tons cold milled material needed to construct the grades shown on the typical section will be provided from other areas of the project as Base Course, Salvaged Asphalt Mix.

COLD MILLING ASPHALT CONCRETE

Cold Milling Asphalt Concrete shall be performed as shown on typical Sections 2 thru 5 for use as Base Course, Salvaged Asphalt Mix and RAP.

Cold Milling Asphalt Concrete shall be performed as necessary at bridge end tapers, and at 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.

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

The Los Angeles Abrasion Loss value on the aggregate used for the in place asphalt concrete ranged from 20 to 22 percent. These values were obtained from testing during construction.

Cold milling asphalt is estimated to produce 17,181 tons of salvaged asphalt concrete material (RAP). An estimated 14,899 tons of RAP for Alt A and 15,337 tons of RAP for Alt B will be used on this project in the Class Q2R Hot Mixed Asphalt Concrete mixture. The Contractor is responsible to assure enough RAP is available for the Class Q2R Hot Mixed Asphalt Concrete. An estimated 1,837 tons will be used as Base Course, Salvaged Asphalt Mix to widen the shoulders on Section 1. The remainder of the salvaged asphalt concrete material 445 tons for Alt A or 7 tons for Alt B shall be used in place of Base Course for surfacing entrances or as directed by the Engineer.

BASE COURSE, SALVAGED ASPHALT MIX

Base Course, Salvaged Asphalt Mix for widening the shoulders on Section 1 shall be obtained from the material produced by cold milling on this project.

Specifications for Base Course, Salvaged shall apply except for the following:

Base Course, Salvaged Asphalt Mix estimated at 2,282 tons Alt A or 1,844 tons Alt B shall be obtained from the material produced and stockpiled on this project and may be used without further testing.

Base Course, Salvaged Asphalt Mix placed on the shoulders shall be compacted according to Section 260.3.D except that a pneumatic tired roller with an effective weight of at least 250 pound per inch of roller width will be required.

At the time of compaction, the material shall have approximately 4% moisture uniformly blended throughout the depth of material. The percent moisture may be adjusted by the Engineer. Included in the Estimate of Quantities is 11 M. Gal./per mile (5.5 MGal per mile has been used to calculate water for compaction for each shoulder) for Water for Granular Material. Water shall be paid for at the contract unit bid price per MGal for “Water for Granular Material”.

All other requirements for Base Course, Salvaged shall apply.

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

BRIDGE APPROACHES

	Remove Asphalt Concrete	Unclassified Excavation	Reinforcement Fabric (MSE)	4" Corrugated Polyethylene Drainage Tubing	Precast Concrete Headwall for Drain
	SqYd	CuYd	SqYd	Ft	Each
Structure No. 32-423-471					
Begin bridge	346.0	105.7	346.0	20	2
End bridge	346.0	105.7	346.0	20	2
Structure No. 10-386-067					
Begin bridge	331	101.2	332.0	20	2
End bridge	331	101.2	332.0	20	2
TOTALS:	**1354.0**	**413.8**	**1356.0**	**80.0**	**8.0**

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.

RUMBLE STRIPES

Rumble Stripe installation shall be completed prior to application of the Flush Seal and Permanent Pavement Markings. The Engineer shall provide the exact start and stop locations for the rumble stripe installation.

Water shall be used with the rumble stripe installation for dust control.

Rumble stripes shall not be placed on any bridge decks or approach slabs.

The gaps for the rumble stripe installation as detailed on the standard plates shall be included with the measurement and payment.

Construction of Asphalt Concrete Rumble Stripes shall be paid for at the contract unit price per mile for “Grind 8” Rumble Strip or Stripe in Asphalt Concrete”.

RUMBLE STRIPE ROADWAY CLEANING

The Contractor shall remove loose material from the driving surface and/or asphalt shoulders of the roadway on a daily basis following rumble stripe installation. Loose material may be broomed so that there will not be a windrow of loose material left after the brooming along the edge of the shoulder. Any windrow left shall be picked up by the Contractor. It shall be the Contractor's responsibility to ensure the loose material does not enter any vegetated areas and/or waterways.

All costs associated with this work shall be incidental to the contract unit price per mile for “Grind 8” Rumble Strip or Stripe in Asphalt Concrete”.

CLASS Q2R HOT MIXED ASPHALT CONCRETE

Mineral Aggregate:

Asphalt concrete aggregates shall consist of reclaimed asphalt pavement (RAP) and virgin aggregate.

Virgin mineral aggregate for Class Q2R Hot Mixed Asphalt Concrete-Alternate A shall conform to the requirements of Class Q2.

Virgin mineral aggregate for Class Q2R Hot Mixed Asphalt Concrete-Alternate B shall consist of a minimum of 80 percent crushed limestone ledgerock and shall conform to the requirements of Class Q2.

The Class Q2R Hot Mixed Asphalt Concrete shall include 20 percent RAP in the mixture. RAP shall be obtained from the material produced by cold milling on this project and may be used without further quality testing.

Mix Design Criteria:

Gyratory Controlled QC/QA Mix Design requirements for the Class Q2R Hot Mixed Asphalt Concrete shall conform to the requirements of Class Q2 except as modified by the following:

Voids in Mineral Aggregate (VMA):

	Minimum VMA (%):
Class Q2R	13.0

All remaining requirements for Class Q2 shall apply.

RATES OF MATERIALS

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

SECTION 1 (Butte CL North)
Sta. 1+74 to Sta. 611+59 (North to South Stationing)

MC-70 ASPHALT FOR PRIME - 3.5 feet each shoulder applied prior to paving.

MC-70 Asphalt for Prime applied at the rate of 2.4 ton applied 3.5 feet wide (0.30 gallons per square yard).

CLASS Q2R HOT MIXED ASPHALT CONCRETE - 2" Lift

	Alt A	Alt B	
Aggregate	1411	1457	Tons
Salvaged Asphalt Concrete	353	364	Tons
PG 58-34 Asphalt Binder	87	80	Tons
Total Mix	1851	1901	Tons
Hydrated Lime	19	19	Tons
Total Mix with Hydrated Lime	1870	1920	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 6.7 ton applied 30 feet wide (0.09 gallons per square yard).

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of 3.6 tons applied 29 feet wide (0.05 gallons per square yard)

Sand for Flush Seal at the rate of 51.6 tons applied 22 feet wide (8 pounds per square yard)

SECTION 2 (South of Hoover N to the Harding CL)
Sta. 0+00 to Sta. 532+17 (North to South Stationing)

CLASS Q2R HOT MIXED ASPHALT CONCRETE - 2" Lift

	Alt A	Alt B	
Aggregate	1575	1626	Tons
Salvaged Asphalt Concrete	394	406	Tons
PG 58-34 Asphalt Binder	97	89	Tons
Total Mix	2066	2122	Tons
Hydrated Lime	21	21	Tons
Total Mix with Hydrated Lime	2087	2143	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 7.0 ton applied 31 feet wide (0.09 gallons per square yard).

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of 3.7 tons applied 30 feet wide (0.05 gallons per square yard)

Sand for Flush Seal at the rate of 51.6 tons applied 22 feet wide (8 pounds per square yard)

SECTION 3 (Curve South of Hoover)
Sta. 532+17 to Sta. 584+64 (North to South Stationing)

CLASS Q2R HOT MIXED ASPHALT CONCRETE - 2" Lift

	Alt A	Alt B	
Aggregate	1764	1821	Tons
Salvaged Asphalt Concrete	441	455	Tons
PG 58-34 Asphalt Binder	109	100	Tons
Total Mix	2314	2376	Tons
Hydrated Lime	23	24	Tons
Total Mix with Hydrated Lime	2337	2400	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 8.5 ton applied 38 feet wide (0.09 gallons per square yard).

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of 4.5 tons applied 36 feet wide (0.05 gallons per square yard)

Sand for Flush Seal at the rate of 51.6 tons applied 22 feet wide (8 pounds per square yard)

SECTION 4 (North of SD 168 East)
Sta. 263+73.07 to Sta. 0+00 (South to North Stationing)

CLASS Q2R HOT MIXED ASPHALT CONCRETE - 2" Lift

	Alt A	Alt B	
Aggregate	1561	1612	Tons
Salvaged Asphalt Concrete	390	403	Tons
PG 58-34 Asphalt Binder	96	89	Tons
Total Mix	2047	2104	Tons
Hydrated Lime	21	21	Tons
Total Mix with Hydrated Lime	2068	2124	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 7.0 ton applied 31 feet wide (0.09 gallons per square yard).

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of 3.7 tons applied 30 feet wide (0.05 gallons per square yard)

Sand for Flush Seal at the rate of 51.6 tons applied 22 feet wide (8 pounds per square yard)

SECTION 5 (SD 168 North)
Sta. 0+1478.6 to Sta. 347+00 (North to South Stationing)

CLASS Q2R HOT MIXED ASPHALT CONCRETE - 2" Lift

	Alt A	Alt B	
Aggregate	1972	2036	Tons
Salvaged Asphalt Concrete	493	509	Tons
PG 58-34 Asphalt Binder	122	112	Tons
Total Mix	2587	2657	Tons
Hydrated Lime	26	27	Tons
Total Mix with Hydrated Lime	2613	2684	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 7.0 ton applied 31 feet wide (0.09 gallons per square yard).

FLUSH SEAL

SS-1h or CSS-1h Emulsified Asphalt for Flush Seal at the rate of 3.7 tons applied 30 feet wide (0.05 gallons per square yard)

Sand for Flush Seal at the rate of 51.6 tons applied 22 feet wide (8 pounds per square yard)

SUMMARY OF ASPHALT CONCRETE COMPACTION

				Alt A		Alt B	
Section	Sta. to	Sta.	Length	Asphalt Concrete Class Q2R with Specified Compaction	Asphalt Concrete Class Q2R without Specified Compaction	Asphalt Concrete Class Q2R with Specified Compaction	Asphalt Concrete Class Q2R without Specified Compaction
				Ton	Ton	Ton	Ton
1	0+00.0	383+05.84	38,305.84	11338.6	2228.1	11645.0	2284.4
Bridge	383+05.84	384+44.16	138.32				
1	384+44.16	611+59.0	22,714.84	6723.6	1321.3	6905.4	1354.6
Equation	611+59.0	0+00.0					
2	0+00.0	380+16.64	38,016.64	11253.0	3773.7	11557.1	3872.8
Bridge	380+16.64	381+87.24	170.60				
2	381+87.24	532+17.0	15,029.76	4448.9	1491.9	4569.1	1531.1
3	532+17.0	584+64.0	5,247.00	1553.2	769.2	1595.1	789.9
Equation	584+64.0	263+73.07					
4	263+73.07	0+00.0	26,373.07	7806.5	2523	8017.5	2591.7
Equation	0+00.0	-14+78.6					
5	-14+78.6	347+00.0	36178.6	10708.9	7195.4	10998.3	7392.5
Additional Quantities Total:				302	5177.5	310	5181.5
			TOTALS:	54134.7	24480.1	55597.5	24998.5

TABLE OF QUANTITIES

									Alt A					Alt B						
Section	Station to	Station	Length	Cold Milling	Cold Milling Asphalt Concrete and Placing Cold Milled Material	Unclassified Excavation, Digouts	MC-70 Asphalt for Prime	SS-1h or CSS-1h Asphalt for Tack	Base Course, Salvaged Asphalt Mix	Base Course	PG 58-34 Asphalt Binder	Class Q2R Hot Mixed Asphalt Concrete	Hydrated Lime	Base Course, Salvaged Asphalt Mix	Base Course	PG 58-34 Asphalt Binder	Class Q2R Hot Mixed Asphalt Concrete	Hydrated Lime	SS-1h or CSS-1h Asphalt for Flush Seal	Sand for Flush Seal
			Ft	SqYd	ton	CuYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
1	0+00.0	383+05.84	38,305.84		6892	363	35.4	48.9	1153	726	631.2	13566.7	137.9	1153	726	580.4	13929.4	137.9	26.3	374.6
Bridge	383+05.84	384+44.16	138.32																	
1	384+44.16	611+59.0	22,714.84		4087	216	21.0	29	684	431	374.3	8044.9	81.8	684	431	344.2	8260.0	81.8	15.6	222.2
Equation	611+59.0	0+00.0																		
2	0+00.0	380+16.64	38,016.64	107292		361		50.1		721	698.5	15026.7	151.3		721	640.9	15429.9	151.3	27.0	371.8
Bridge	380+16.64	381+87.24	170.60																	
2	381+87.24	532+17.0	15,029.76	42418		143		19.9		285	276.2	5940.8	59.8		285	253.4	6100.2	59.8	10.7	147
3	532+17.0	584+64.0	5,247.00	20172		50		8.5		100	108.4	2322.4	22.9		100	99.4	2385.0	23.9	4.5	51.4
Equation	584+64.0	263+73.07																		
4	263+73.07	0+00.0	26,373.07	82050		250		34.8		500	479.6	10329.5	104.9		500	444.6	10609.2	104.9	18.7	257.9
Equation	0+00.0	-14+78.6																		
5	-14+78.6	347+00.0	36178.6	100497		343		47.7		686	836	17904.3	178.2		686	767.5	18390.8	185.1	25.7	353.8
Additional Quantities Total:			0	0	0	0	1.6	20.9	445	1789	257.4	5479.5	54.9	7	2227	230.6	5491.5	55.1	0	0
		Totals:	**182,174.67**	**352,429.00**	**10,979**	**1,726**	**58.0**	**259.8**	**2,282**	**5,238**	**3,661.6**	**78,614.8**	**791.70**	**1,844**	**5,676**	**3,361.0**	**80,596.0**	**799.8**	**128.5**	**1,778.7**

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	10	45

Revised: 10-3-16 klh

TABLE OF ADDITIONAL QUANTITIES

									Alt A					Alt B						
Section	Station to	Station	Length	Cold Milling	Cold Milling Asphalt Concrete and Placing Cold Milled Material	Unclassified Excavation, Digouts	MC-70 Asphalt for Prime	SS-1h or CSS-1h Asphalt for Tack	Base Course, Salvaged Asphalt Mix	Base Course	PG 58-34 Asphalt Binder	Class Q2R Hot Mixed Asphalt Concrete	Hydrated Lime	Base Course, Salvaged Asphalt Mix	Base Course	PG 58-34 Asphalt Binder	Class Q2R Hot Mixed Asphalt Concrete	Hydrated Lime	SS-1h or CSS-1h Asphalt for Flush Seal	Sand for Flush Seal
			Ft	SqYd	ton	CuYd	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton	Ton
Spot leveling, strengthening and repair of existing surface			181,865.75					8.5			161.9	3444.5	34.5			144.7	3444.5	34.5		
Bridge Approaches																				
Structure No. 32-423-471																				
Begin Bridge							0.4	0.1		231	3.6	77	0.8		231	3.3	79	0.8		
End Bridge							0.4	0.1		231	3.6	77	0.8		231	3.3	79	0.8		
Structure No. 10-386-067																				
Begin Bridge							0.4	0.1		221	3.5	74	0.7		221	3.2	76	0.8		
End Bridge							0.4	0.1		221	3.5	74	0.7		221	3.2	76	0.8		
Guardrail																				
Structure No. 32-423-471																				
Begin Bridge Lt.								0.5		64	0.9	19	0.2		64	0.8	19	0.2		
Begin Bridge Rt.								0.9		123	1.4	30	0.3		123	1.3	31	0.3		
End Bridge Lt.								0.9		123	1.4	30	0.3		123	1.3	31	0.3		
End Bridge Rt.								0.5		64	0.9	19	0.2		64	0.8	19	0.2		
Structure No. 10-386-067																				
Begin Bridge Lt.								0.5		80	0.9	20	0.2		80	0.8	20	0.2		
Begin Bridge Rt.								1.0		37	1.5	32	0.3		37	1.4	33	0.3		
End Bridge Lt.								1.0		52	1.5	32	0.3		52	1.4	33	0.3		
End Bridge Rt.								0.5		55	0.9	20	0.2		55	0.8	20	0.2		
Entrances (116)								2.3	445	135	32.7	696	7	7	573	29.2	696	7		
Intersecting Roads (12)								1.6		60	32.9	700	7		60	29.4	700	7		
Mailbox Turnout (9)								2.3		92	6.3	135	1.4		92	5.7	135	1.4		
Additional Quantities Total:				**0**	**0**	**0**	**1.6**	**20.9**	**445**	**1789**	**257.4**	**5479.5**	**54.9**	**7**	**2227**	**230.6**	**5491.5**	**55.1**	**0**	**0**

Guardrail
New Guardrail embankment will be surfaced with 12” Base Course and 2” thick asphalt.

Surfacing for Approaches and Field Entrances

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. The Contractor shall use the remainder of the Base Course, Salvaged Asphalt Mix for entrances and reduce the quantity of Base Course required for the entrances.

Mailbox turnouts
Mailbox turnouts will be surfaced with 4” of Base Course and 2” thick asphalt.

TABLE OF GUARDRAIL

Location	Salvage W Beam Guardrail	Salvage W Beam Guardrail Tangent End Terminal	Remove Double Thrie Beam Guardrail for Reset	Remove Double W Beam Guardrail for Reset	Remove W Beam Guardrail for Reset	Remove W to Thrie Beam Guardrail Transition for Reset	Remove W Beam Guardrail Flared End Terminal for Reset	Remove Rubrail for Reset	Straight Class A W Beam Guardrail w/ Wood Posts	W Beam Guardrail Flared End Terminal	Beam Guardrail Post and Block	Reset Double Thrie Beam Rail	Reset W Beam Rail	Reset Double W Beam Rail	Reset W Beam to Thrie Beam Guardrail Transition	Reset W Beam Guardrail Flared End Terminal	Reset Rubrail	Guardrail Delineator	Contractor Furnished Borrow Excavation
	Ft	Each	Ft	Ft	Ft	Each	Each	Ft	Ft	Each	Each	Ft	Ft	Ft	Each	Each	Ft	Each	CuYd
Structure No. 32-423-471																			
Begin Bridge Lt.		1		25	25			12.5	25	1	14		25	25			12.5	4	382
Begin Bridge Rt.		1		25	50			12.5	62.5	1	18		50	25			12.5	4	736
End Bridge Lt.		1		25	50			12.5	62.5	1	18		50	25			12.5	4	246
End Bridge Rt.		1		25	25			12.5	25	1	22		25	25			12.5	4	319
Structure No. 10-386-067																			
Begin Bridge Lt.			12.5		37.5	1	1		25		23	12.5	37.5		1	1		4	396
Begin Bridge Rt.	25		12.5		62.5	1	1		62.5		27	12.5	62.5		1	1		4	185
End Bridge Lt.	50		12.5		37.5	1	1		87.5		23	12.5	37.5		1	1		4	624
End Bridge Rt.			12.5		37.5	1	1		25		23	12.5	37.5		1	1		4	653
TOTALS:	**75**	**4**	**50**	**100**	**325**	**4**	**4**	**50**	**375**	**4**	**168**	**50**	**325**	**100**	**4**	**4**	**50**	**32**	**3541**

SALVAGE W BEAM GUARDRAIL TANGENT END TERMINAL

Salvage W Beam Guardrail Tangent End Terminal includes 50' of steel beam rail. Steel beam rail, end terminals, and hardware items shall become the property of the State and shall be removed, hauled, and neatly stacked at Newell Maintenance Yard located at 201 E 8th St. (US Hwy 212) in Newell 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 each for "Salvage W Beam Guardrail Tangent End Terminal".

RESET W BEAM GUARDRAIL FLARED END TERMINAL

An additional quantity of "Beam Guardrail Post and Block" has been provided for installing new posts in the W Beam Guardrail Terminals. All costs associated with this work shall be incidental to the contract unit price per each for "Reset W Beam Flared End Terminal" and for "Beam Guardrail Post and Block". The Contractor is responsible to provide the correct type of post and block required for the end terminal being reset.

RESET BEAM GUARDRAIL

The Contractor shall not reset beam guardrail that has drilled holes, extra holes, tears, and dents 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 Contractor shall use aluminum delineators 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	Double	Contractor Furnished Borrow Excavation
		Each	Each	CuYd
151.65	L	1	-	
151.8	L	1	-	
156.89	L	1	-	
157.48	L	-	1	
167.17	R	-	1	138
171.07	R	1	-	138
173.91	R	1	-	138
182.95	L	1	-	
	TOTALS:	**6**	**2**	**414**

CONTRACTOR FURNISHED TOPSOIL

It is anticipated that a larger volume of topsoil will be needed for the backing of the safety edge than can be salvaged from the existing grade. The Contractor will be required to furnish and place 4 inches of topsoil on roadway inslopes and areas as determined by the Engineer during construction.

Contractor furnished topsoil shall be free from clay lumps, stones, coarse gravel, or similar objects larger than 1/2 inch in diameter. Brush, stumps, roots, wood, objectionable weeds, litter, or any other material which may be harmful to plant growth will not be allowed. Organic material shall be decomposed.

All costs to furnish and place the Contractor furnished topsoil shall be incidental to the contract unit price per cubic yard for “Contractor Furnished Topsoil”.

REMOVE AND REPLACE TOPSOIL

Prior to beginning resurfacing operations for Sections 1, 2, 4, and 5 a 4” depth of topsoil shall be bladed down the respective inslopes and left in a windrow 6’+/- from the subgrade shoulder. Following completion of resurfacing operations, topsoil shall be bladed back up the inslope to the point indicated on the typical section.

Topsoil shall also be salvaged and stockpiled prior to constructing the 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 26,336 CuYd.

All costs associated with removing and replacing the topsoil along areas to be resurfaced shall be incidental to the contract lump sum price for “Remove and Replace Topsoil”.

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 by the seed supplier 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 as shown below or an approved equal:

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 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% (P_2O_5) available phosphate, a minimum of 4% (K_2O) 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 fertilizer shall be applied at a rate of 1,500 pounds per acre in accordance with the manufacturer’s recommended method of application.

The all-natural slow release fertilizer shall be as shown below or an approved equal:

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

PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadway.

Type F Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana	7
Green Needlegrass	Lodorm	4
Sideoats Grama	Butte, Killdeer, Pierre, Trailway	3
Blue Grama	Bad River, Willis	2
Oats or Spring Wheat: April through May; Winter Wheat: August through November		10
	Total:	26

TABLE OF EROSION CONTROL QUANTITIES

			Length	Width	Area	Seeding	Fertilizer	Mulch	Contractor Furnished Topsoil
Section	Station to	Station	ft	each side	acre	lb	ton	ton	cuyd
1	0+00.0	383+05.84	38,305.84	8	15	390	11.3	30.0	1892
Bridge	383+05.84	384+44.16							
1	384+44.16	611+59.0	22,714.84	8	9	234	6.8	18.0	1122
Equation	611+59.0	0+00.0							
2	0+00.0	380+16.64	38,016.64	8	14	364	10.5	28.0	1127
Bridge	380+16.64	381+87.24							
2	381+87.24	532+17.0	15,029.76	8	6	156	4.5	12.0	446
3	532+17.0	584+64.0	5,247.00						
Equation	584+64.0	263+73.07							
4	263+73.07	0+00.0	26,373.07	8	10	260	7.5	20.0	782
Equation	0+00.0	-14+78.6							
5	-14+78.6	347+00.0	36178.6	8	14	364	10.5	28.0	2144
Structure No. 32-423-471				sq ft					
Begin Bridge Lt.				2796	1	26	0.8	2.0	
Begin Bridge Rt.				3960	1	26	0.8	2.0	
End Bridge Lt.				1320	1	26	0.8	2.0	
End Bridge Rt.				2330	1	26	0.8	2.0	
Structure No. 10-386-067									
Begin Bridge Lt.				1550	1	26	0.8	2.0	
Begin Bridge Rt.				2370	1	26	0.8	2.0	
End Bridge Lt.				4632	1	26	0.8	2.0	
End Bridge Rt.				4200	1	26	0.8	2.0	
				TOTALS:	**76**	**1976**	**57.5**	**152.0**	**7513**

STORM WATER POLLUTION PREVENTION PLAN CHECKLIST

*(The numbers right of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES*

SITE DESCRIPTION (4.2 1)

- **Project Limits: See Title Sheet (4.2 1.b)**
- **Project Description: See Title Sheet (4.2 1.a.)**
- **Site Map(s): See Title Sheet and Plans (4.2 1.f. (1)-(6))**
- **Major Soil Disturbing Activities** (check all that apply)
  - ☐ Clearing and grubbing
  - ☐ Excavation/borrow
  - ☐ Grading and shaping
  - ☒ Filling
  - ☐ Cutting and filling
  - ☐ Other (describe):
- **Total Project Area** 163.5 **(4.2 1.b.)**
- **Total Area To Be Disturbed** 76 acre **(4.2 1.b.)**
- **Existing Vegetative Cover (%)**
- **Soil Properties:** AASHTO Soil or USDA-NRCS Soil Series Classification A-4, A-6, A-7-5 or A-7-6 **(4.2 1. d.)**
- **Name of Receiving Water Body/Bodies** North Fork Moreau River & South Fork Moreau River **(4.2 1.e.)**

ORDER OF CONSTRUCTION ACTIVITIES (4.2 1.c.)

(Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Initiation of final or temporary stabilization may exceed the 14-day limit if earth disturbing activities will be resumed within 21 days.)

- **Remove and store topsoil.**
- **Complete shoulder widening.**
- **Complete final paving.**
- **Complete traffic control installation and protection devices.**
- **Reseed areas disturbed by removal activities**.

EROSION AND SEDIMENT CONTROLS (4.2 2.a.(1)(a)-(f))

(Check all that apply)

- **Stabilization Practices (See Detail Plan Sheets)**
  - ☐ Temporary Seeding (Cover Crop Seeding)
  - ☒ Permanent Seeding
  - ☐ Sodding
  - ☐ Planting (Woody Vegetation for Soil Stabilization)
  - ☒ Mulching (Grass Hay or Straw)
  - ☐ Hydraulic Mulch (Wood Fiber Mulch)
  - ☐ Soil Stabilizer
  - ☐ Bonded Fiber Matrix
  - ☐ Erosion Control Blankets or Mats
  - ☐ Vegetation Buffer Strips
  - ☐ Roughened Surface (e.g. tracking)
  - ☐ Dust Control (See Section F – Surfacing Plans)
  - ☐ Other:
- **Structural Temporary Erosion and Sediment Controls**
  - ☐ Silt Fence
  - ☐ Floating Silt Curtain
  - ☐ Straw Bale Check
  - ☒ Temporary Berm
  - ☐ Temporary Slope Drain
  - ☐ Straw Wattles or Rolls
  - ☐ Turf Reinforcement Mat
  - ☐ Rip Rap
  - ☐ Gabions
  - ☐ Rock Check Dams
  - ☐ Sediment Traps/Basins
  - ☐ Inlet Protection
  - ☐ Outlet Protection
  - ☐ Surface Inlet Protection (Area Drain)
  - ☐ Curb Inlet Protection
  - ☐ Stabilized Construction Entrances
  - ☐ Entrance/Exit Equipment Tire Wash
  - ☐ Interceptor Ditch
  - ☐ Concrete Washout Facility
  - ☐ Temporary Diversion Channel
  - ☐ Work Platform
  - ☐ Temporary Water Barrier
  - ☐ Temporary Water Crossing
  - ☐ Other:
- **Wetland Avoidance**

  Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☐ No ☒ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.
- **Storm Water Management (4.2 2.b., (1) and (2))**

  Storm water management will be handled by temporary controls outlined in "EROSION AND SEDIMENT CONTROLS" above, and any permanent controls needed to meet permanent storm water management needs in the post construction period. Permanent controls will be shown on the plans and noted as permanent.
- **Other Storm Water Controls (4.2 2.c., (1) and (2))**
  - **Waste Disposal**

    All liquid waste materials will be collected and stored in sealed metal containers approved by the project engineer. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal, and notices stating proper practices will be posted in the field office. The general Contractor's representative responsible for the conduct of work on the site will be responsible for seeing waste disposal procedures are followed.
  - **Hazardous Waste**

    All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the individual designated as the Contractor's on-site representative will be responsible for seeing that these practices are followed.
  - **Sanitary Waste**

    Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units in a timely manner by a licensed waste management Contractor or as required by any local regulations.

MAINTENANCE AND INSPECTION (4.2 3. and 4.2 4.)

- **Maintenance and Inspection Practices**
  - Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
  -
  -
  - All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
  - Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches $^1/_3$ of the height of the silt fence.
  - Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
  - Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
  - All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
  - Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
  - The SDDOT Project Engineer and Contractor's Erosion Control Supervisor are responsible for inspections. Maintenance, repair activities are the responsibility of the Contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

NON-STORM WATER DISCHARGES (3.0)

The following non-storm water discharges are anticipated during the course of this project (check all that apply).

- ☐ Discharges from water line flushing.
- ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☐ Uncontaminated ground water associated with dewatering activities.

MATERIALS INVENTORY (4.2. 2.c.(2))

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the headings "EROSION AND SEDIMENT CONTROLS" and "SPILL PREVENTION" (check all that apply).

- ☐ Concrete and Portland Cement
- ☐ Detergents
- ☒ Paints
- ☒ Metals
- ☒ Bituminous Materials
- ☒ Petroleum Based Products
- ☐ Cleaning Solvents
- ☒ Wood
- ☐ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Other:

SPILL PREVENTION (4.2 2.c.(2))

- **Material Management**
  - Housekeeping
    - Only needed products will be stored on-site by the Contractor.
    - Except for bulk materials the contractor will store all materials under cover and in appropriate containers.
    - Products must be stored in original containers and labeled.
    - Material mixing will be conducted in accordance with the manufacturer's recommendations.
    - When possible, all products will be completely used before properly disposing of the container off-site.
    - The manufacturer's directions for disposal of materials and containers will be followed.
    - The Contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
    - Dust generated will be controlled in an environmentally safe manner.
    - Vegetation areas not essential to the construction project will be preserved and maintained as noted on the plans.

  - Hazardous Materials
    - Products will be kept in original containers unless the container is not resealable.
    - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
    - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
    - Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
    - Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any storm water system or storm water treatment system.
    - Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of storm water runoff.

- **Product Specific Practices (6.8)**

  - Petroleum Products
    All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.
  - Fertilizers
    Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to storm water. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.
  - Paints
    All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.
  - Concrete Trucks
    Contractors will provide designated truck washout facilities on the site. These areas must be self-contained and not connected to any storm water outlet of the site. Upon completion of construction, the area at the washout facility will be properly stabilized.

- **Spill Control Practices (4.2 2 c.(2))**

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill cleanup will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the Contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for cleanup purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The Contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator. The Contractor is responsible for ensuring that the site superintendent has had appropriate training for hazardous materials handling, spill management, and cleanup.

- **Spill Response (4.2 2 c.(2))**

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens storm water or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The Contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the Contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The Contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.

- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SD DENR.
- Personnel with primary responsibility for spill response and clean up will receive training by the Contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

SPILL NOTIFICATION

In the event of a spill, the Contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to DENR immediately **if any one of the following** conditions exists:
  - The discharge threatens or is in a position to threaten the waters of the state (surface water or ground water).
  - The discharge causes an immediate danger to human health or safety.
  - The discharge exceeds 25 gallons.
  - The discharge causes a sheen on surface water.
  - The discharge of any substance that exceeds the ground water quality standards of ARSD (Administrative Rules of South Dakota) chapter 74:51:01.
  - The discharge of any substance that exceeds the surface water quality standards of ARSD chapter 74:51:01.
  - The discharge of any substance that harms or threatens to harm wildlife or aquatic life.
  - The discharge of crude oil in field activities under SDCL (South Dakota Codified Laws) chapter 45-9 is greater than 1 barrel (42 gallons).

To report a release or spill, call DENR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at 605-773-3231. Reporting the release to DENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, the responsible person must also contact local authorities to determine the local reporting requirements for releases. DENR recommends that spills also be reported to the National Response Center at (800) 424-8802.

CONSTRUCTION CHANGES (4.4)

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP plan (DOT 298) and drawings to reflect the needed changes. Copies of changes will be routed per DOT 298. Copies of forms and the SWPPP will be retained in a designated place for review over the course of the project.

CERTIFICATIONS

- **Certification of Compliance with Federal, State, and Local Regulations**

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

- **South Dakota Department of Transportation**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Tom Hahnfeld

Authorized Signature (See the General Permit, Section 6.9.1.C.)

- **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature

CONTACT INFORMATION

- **Contractor Information**:
  - Prime Contractor Name: _____
  - Contractor Contact Name: _____
  - Address: _____
  - _____
  - City: _____State: _____Zip: _____
  - Office Phone: _____Field: _____
  - Cell Phone: _____Fax: _____
- **Erosion Control Supervisor**
  - Name: _____
  - Address: _____
  - _____
  - City: _____State: _____Zip: _____
  - Office Phone: _____Field: _____
  - Cell Phone: _____Fax: _____
- **SDDOT Project Engineer**
  - Name: _____
  - Business Address: _____
  - Job Office Location: _____
  - City: _____State: _____Zip: _____
  - Office Phone: _____Field: _____
  - Cell Phone: _____Fax: _____
- **SD DENR Contact Spill Reporting**
  - Business Hours Monday-Friday (605) 773-3296
  - Nights and Weekends (605) 773-3231
- **SD DENR Contact for Hazardous Materials.**
  - (605) 773-3153
- **National Response Center Hotline**
  - (800) 424-8802.

SEQUENCE OF OPERATIONS

During the use of the pilot car, the Contractor will be limited to 15 minute traffic delays.

1. Set up Traffic Control.
2. Perform Cold Milling and Placing Cold Milled Material, Prime Shoulders, allow 7 days to cure.
3. Complete milling and perform digouts where necessary.
4. Complete bridge approach work.
5. Complete guardrail and mailbox embankment work.
6. Complete spot leveling.
7. Complete Asphalt Concrete Surfacing.
8. Complete installation of rumble stripes.
9. Complete flush seal operation.
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 and adjacent businesses.

TRAFFIC CONTROL – GENERAL NOTES

- 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.

- Unless otherwise stated in these plans, no work will be allowed during hours of darkness.

- Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage of the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

- Non-applicable traffic control devices shall be completely covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 2 calendar days.

- All regulatory signs shall have a minimum mounting height of 5' in rural locations, even when mounted on portable supports.

- Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

- All materials and equipment shall be stored a minimum distance of 30' from the traveled way during nonworking hours.

- The Contractor shall provide installation details at the preconstruction meeting for all breakaway sign support assemblies.

- All haul trucks shall be equipped with a second flashing amber light that is visible from the backside of the haul truck. The costs for the flashing amber lights shall be incidental to the various related contract bid items.

- All construction operations shall be conducted in the general direction of traffic movement.

- 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.

- Temporary Flexible Vertical Markers (Tabs) shall be used for lane closure tapers or lane shift tapers and shall be installed at 5' spacing. Tabs used for tapers and shifts will not be measured for payment. 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 will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

- Bump Signs (W8-1, black on orange) with appropriate Advisory Speed Plaque (W13-1P, black on orange) shall be placed 500' in advance of the bump or as approved by the Engineer for adequate sight distance. Type I Object Markers (orange - 18"x18") shall be placed at the bump location.

- Road Work Ahead (W20-1) signs shall be placed at applicable intersecting roads and as directed by the Engineer.

- The Contractor shall place Uneven Lane (W8-11) signs where appropriate.

OVERWIDTH DETOUR SIGNING

Details of the approximate location of the Overwidth Detour Signing are as shown in these plans. Prior to installing the signs the Contractor shall mark out the sign locations and review them with the Engineer.

Overwidth Detour Signing shall be furnished and installed by the Contractor as detailed in these plans. It will be the responsibility of the Contractor to maintain and reinstall these signs during the project as required by the construction progress. Upon completion of the project, the Contractor shall remove the Overwidth Detour Signing. Overwidth Detour Signing shall be installed on fixed location, ground mounted, breakaway supports.

Payment for furnishing, installing, maintaining and removing the signs and hardware shall be incidental to the contract unit price per square foot for Detour Signing.

TABLE OF TRAFFIC CONTROLS SIGNS

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	4	30"	5.2	20.8
W1-4	REVERSE CURVE (L or R)	2	48" x 48"	16.0	32.0
W3-1	STOP AHEAD (symbol)	4	48" x 48"	16.0	64.0
W3-4	BE PREPARED TO STOP	2	48" x 48"	16.0	32.0
W8-1	BUMP	6	48" x 48"	16.0	96.0
W8-6	TRUCK CROSSING	2	48" x 48"	16.0	32.0
W8-11	UNEVEN LANES	2	48" x 48"	16.0	32.0
W13-1P	ADVISORY SPEED (plaque)	4	30" x 30"	6.3	25.2
W20-1	ROAD WORK AHEAD	14	48" x 48"	16.0	224.0
W20-4	ONE LANE ROAD AHEAD	4	48" x 48"	16.0	64.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-2	FRESH OIL	2	48" x 48"	16.0	32.0
G20-1	ROAD WORK NEXT __ MILES	2	36" x 18"	4.5	9.0
G20-2	END ROAD WORK	2	36" x 18"	4.5	9.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			704.0

TABLE OF DETOUR SIGNS

		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
SPECIAL	NO VEHICLES OVER 12 FT WIDE	2	96" x 24"	16.0	32.0
SPECIAL	WIDTH RESTRICTION 12 FT WIDE 14 MILES AHEAD	1	96" x 48"	32.0	32.0
SPECIAL	WIDTH RESTRICTION 12 FT WIDE (Legend Varies)	5	96" x 84"	56.0	280.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			344.0

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	ESTIMATED TOTAL MILES NO PASSING ZONE
SD Highway 79	58	57	13.1

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 Pavement Marking Paint shall be used on all surfaces except for the final lift of Class Q2R Hot Mixed Asphalt. Temporary Flexible Vertical Markers (Tabs) with protective marker covers shall be used on the final lift of Class Q2R Hot Mixed Asphalt Concrete and for the flush seal. The Contractor shall remove the protective marker covers after the application of the flush seal. All costs for temporary pavement marking including furnishing, applying, remove covers, maintenance and removal of tabs shall be incidental to the contract unit price per mile for "Temporary Pavement Marking".

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 pavement markings shall be a Waterborne Pavement Marking Paint with High Grade Polymer.

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.

WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

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

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

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

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

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

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

WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER (CONT.)

Initial readings:

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

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

RATES OF MATERIALS FOR WATERBORNE PAVEMENT MARKING PAINT WITH HIGH GRADE POLYMER

Solid 4" line = 27.8 Gals/Mile
Glass Beads = 5.3 Lbs/Gal.
Composite Reflective Elements = 2.1 Lbs/Gal.

All cost for materials, labor and equipment necessary to furnish and install the pavement markings shall be incidental to the contract unit price per gallon for "Waterborne Pavement Marking Paint with High Grade Polymer, White or Yellow".

Centerline striping (yellow) – 41.7 gallons per mile. *

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	18	45

Revised: 10-3-16 klh

PAVEMENT MARKING DETAIL

TWO LANE ROADWAY

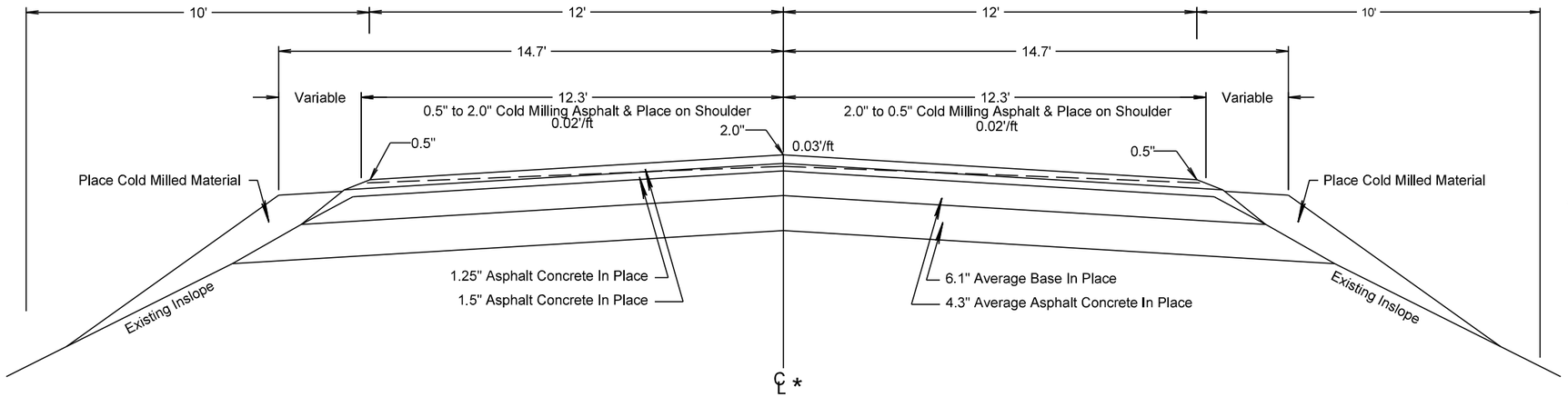
TYPICAL SECTION SURFACING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	19	45

Plotting Date: 10/11/2016 Revised: 10-11-2016 klh

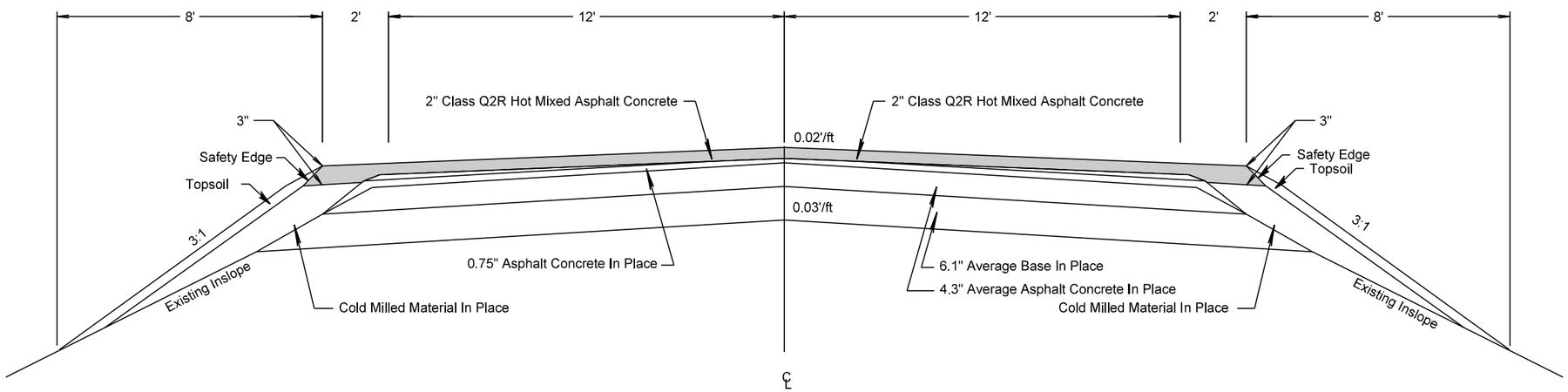
Plot Scale - 1:4

Section 1 (Butte CL North)
Sta 1+74 to Sta 611+59 (North to South Stationing)
In Place & Cold Milling Section



* The location of centerline needs to be adjusted to construct as per this typical section. (Adjust 0" to 12")

Resurfacing Section



Plotted From - trrc11610

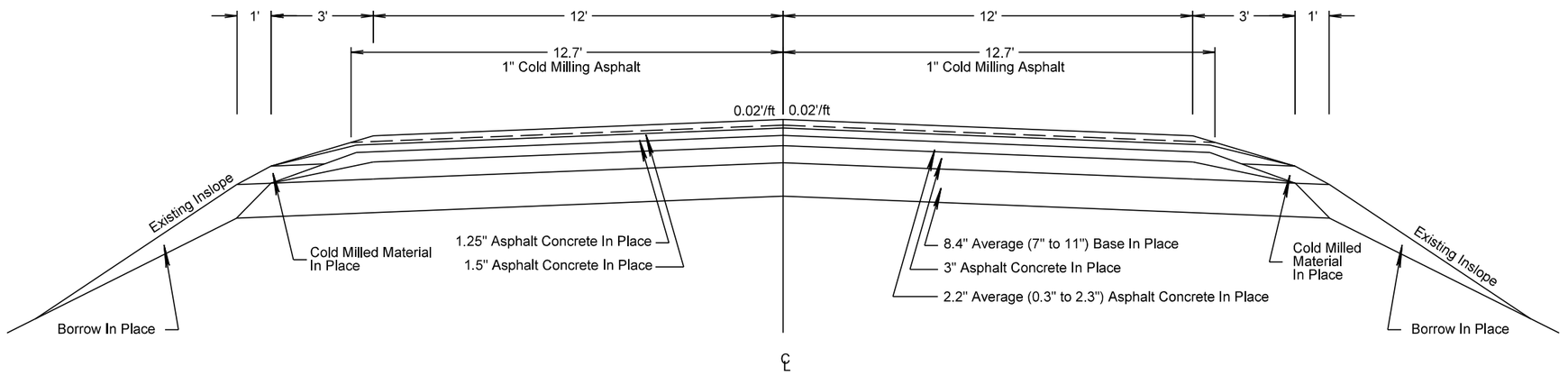
File - ...\Butte05P7\design\Typ_05p7.dgn

TYPICAL SECTION SURFACING

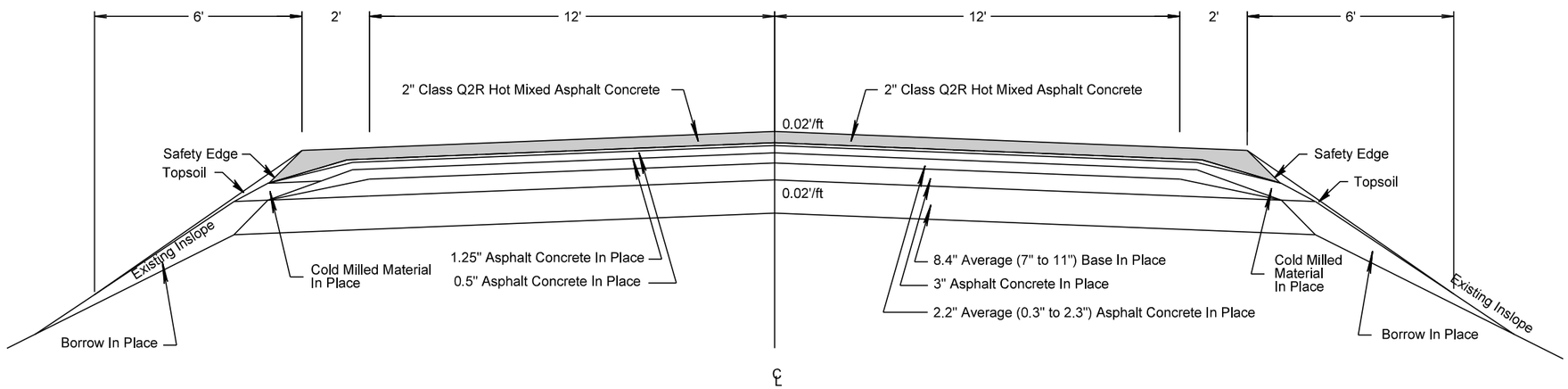
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	20	45

Plotting Date: 09/29/2016

Section 2 (South of Hoover N to the Harding CL)
Sta 0+00 to Sta 532+17 (North to South Stationing)
In Place & Cold Milling Section



Resurfacing Section



Plot Scale - 1:4

Plotted From - trrc11610

File - ...\But\e05P7\design\Typ_05p7.dgn

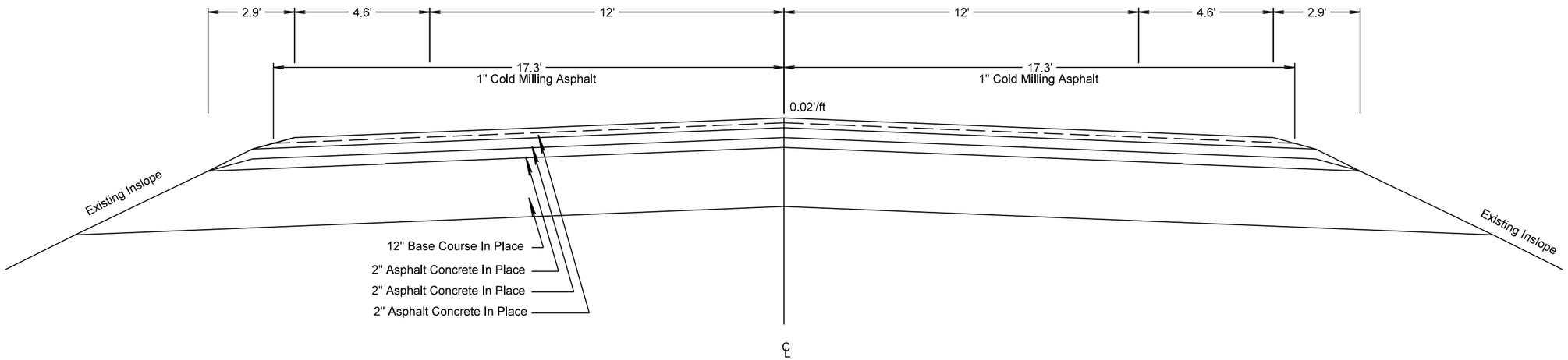
TYPICAL SECTION SURFACING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	21	45

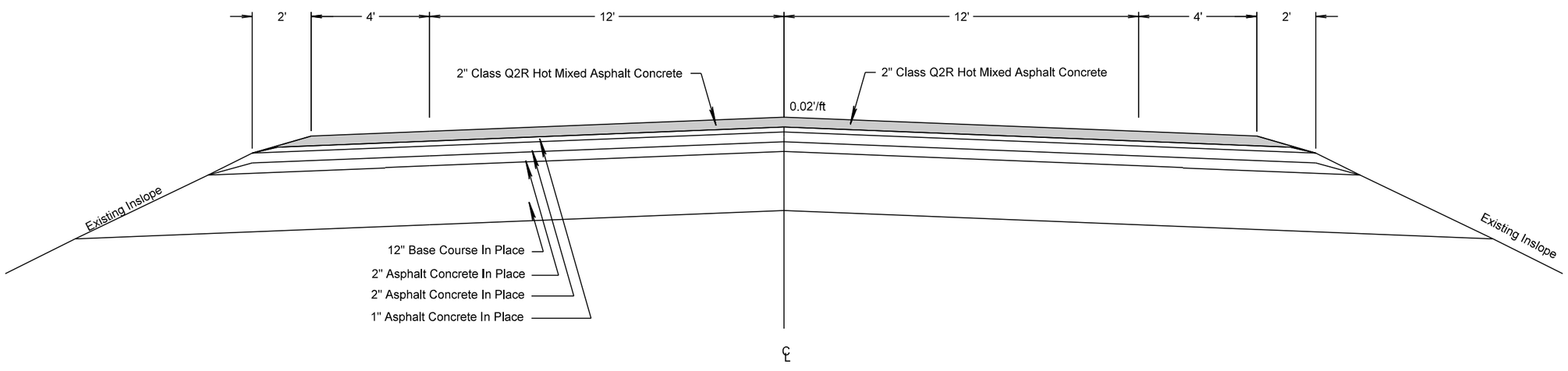
Plotting Date: 09/29/2016

Plot Scale - 1:4

Section 3 (Curve S of Hoover)
Sta 532+17.0 to Sta 584+64.0 (North to South Stationing)
In Place & Cold Milling Section



Resurfacing Section



Plotted From - trrc11610

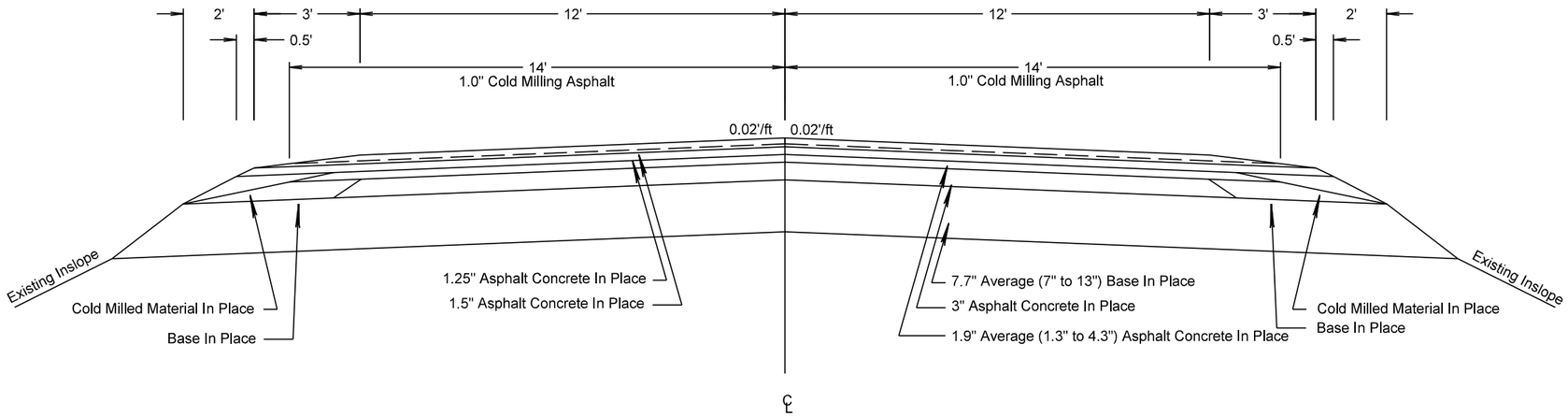
File - ...\Bute05P7\design\Typ_05p7.dgn

TYPICAL SECTION SURFACING

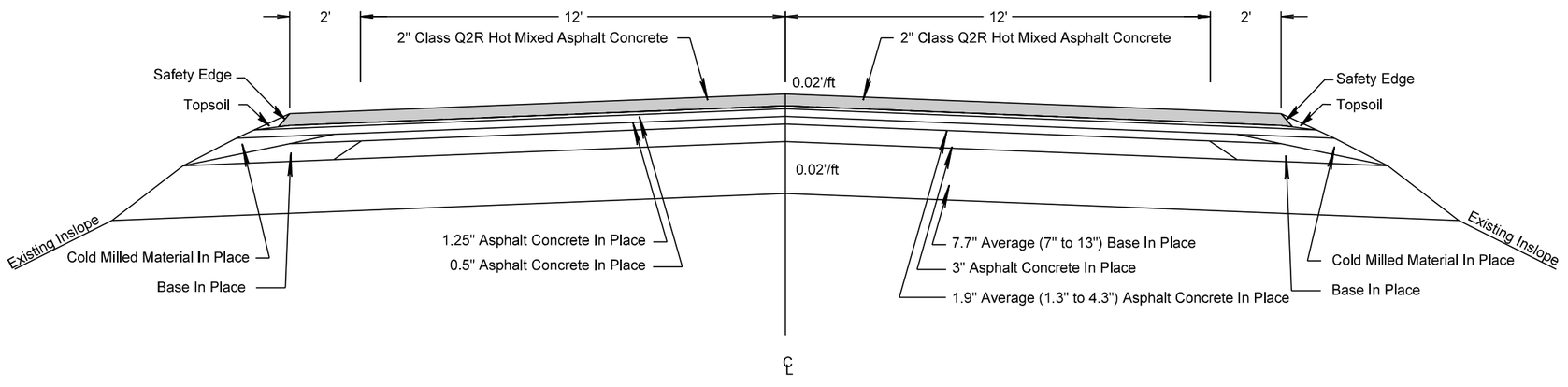
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	22	45

Plotting Date: 09/29/2016

Section 4 (North of SD168 East)
Sta 263+73.07 to Sta 0+00 (South to North Stationing)
In Place & Cold Milling Section



Resurfacing Section



Plot Scale - 1:4

Plotted From - trrc11610

File - ...\Bute05P7\design\Typ_05p7.dgn

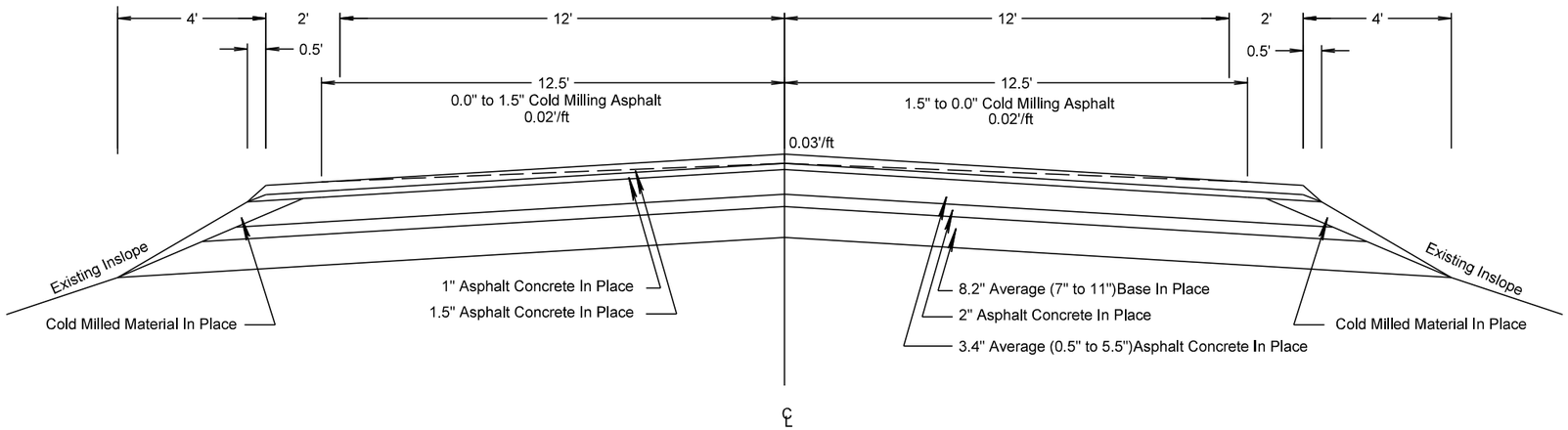
TYPICAL SECTION SURFACING

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	23	45

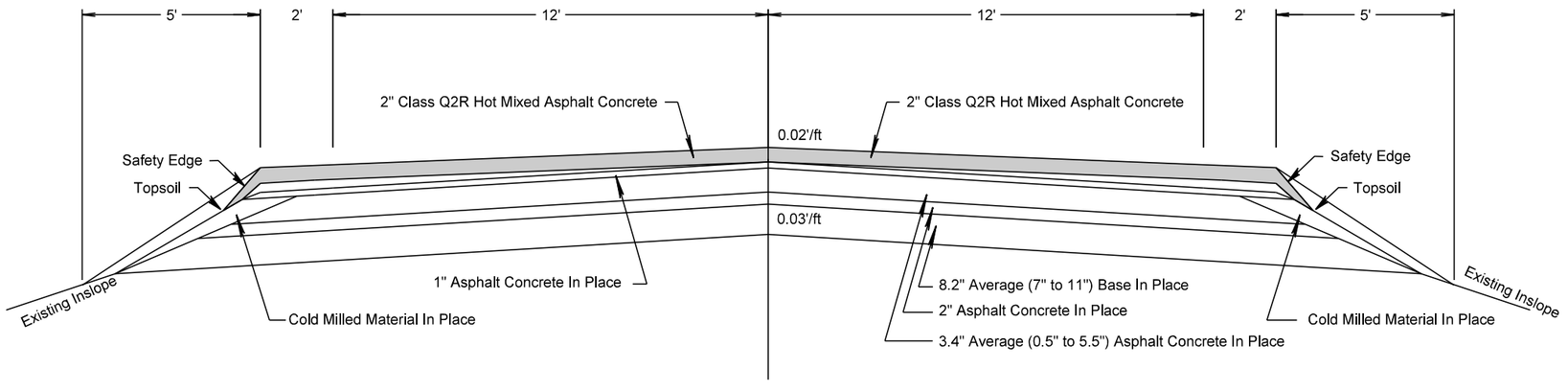
Plotting Date: 09/29/2016

Plot Scale - 1:4

Section 5 (SD168 North)
Sta 0-1478.6 to Sta 347+00 (North to South Stationing)
In Place & Cold Milling Section



Resurfacing Section



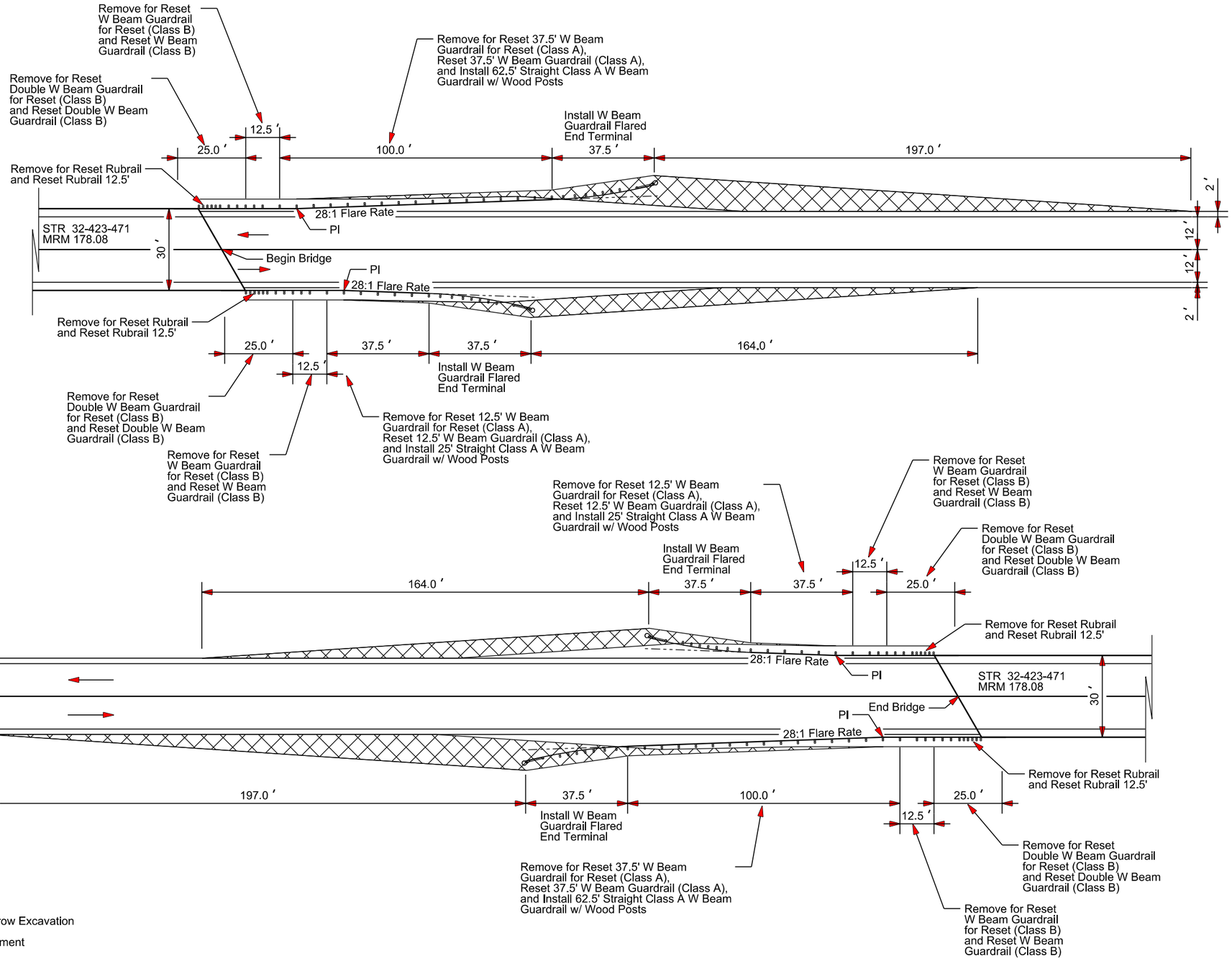
Plotted From - trrc11610

File - ...\Bute05P7\design\Typ_05p7.dgn

GUARDRAIL LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	24	45

Plotting Date: 10/04/2016 Revised: 10-3-16 klh



Plot Scale - 1:40

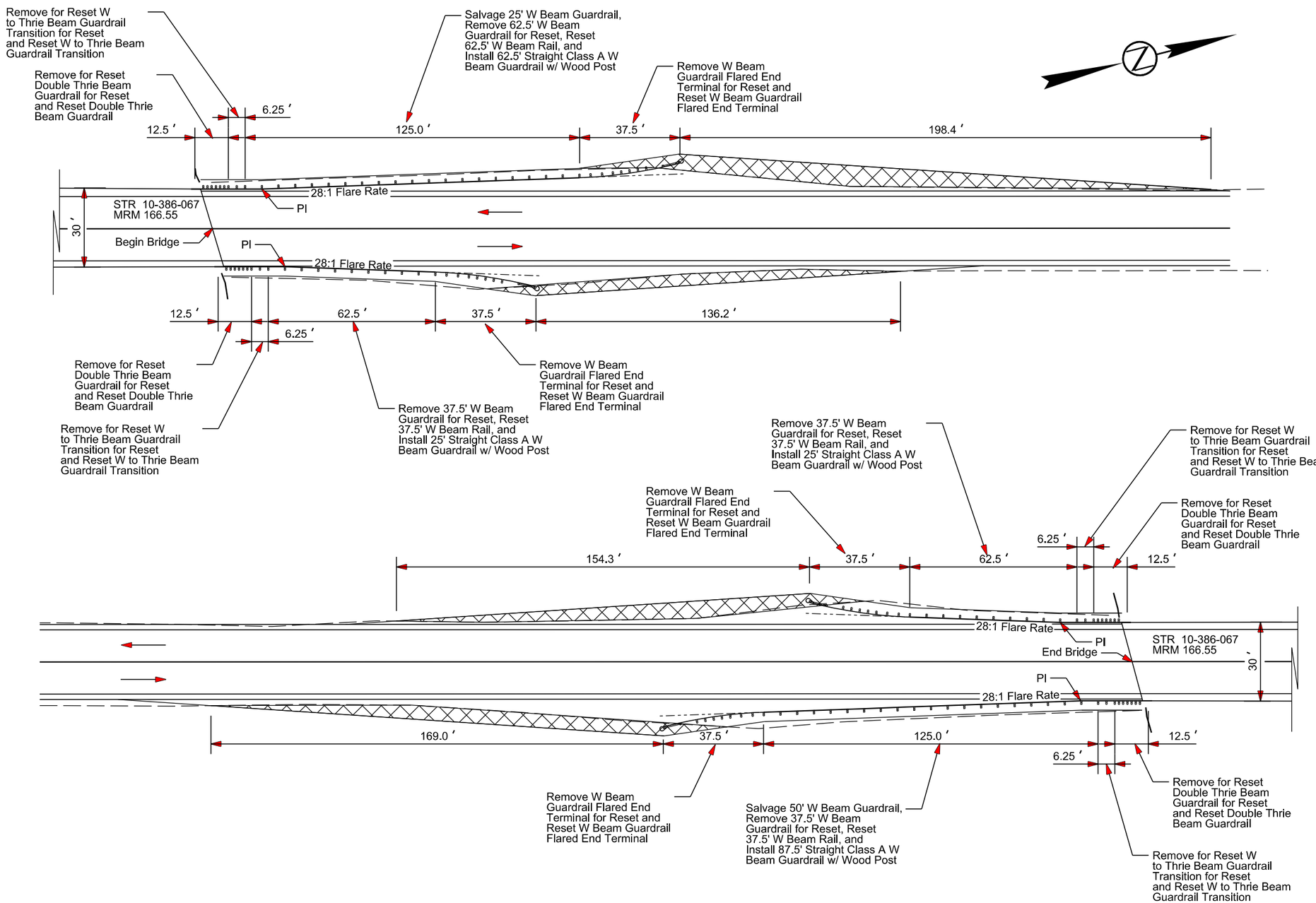
Plotted From - trrc11610

File - ...\pr\Bute05P7\design\gr05p7.dgn

GUARDRAIL LAYOUT

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	25	45

Plotting Date: 10/04/2016 Revised: 10-3-16 klh



Contractor Furnished Borrow Excavation
12" Base Course
2" Asphalt Concrete Pavement

Plot Scale - 1:40

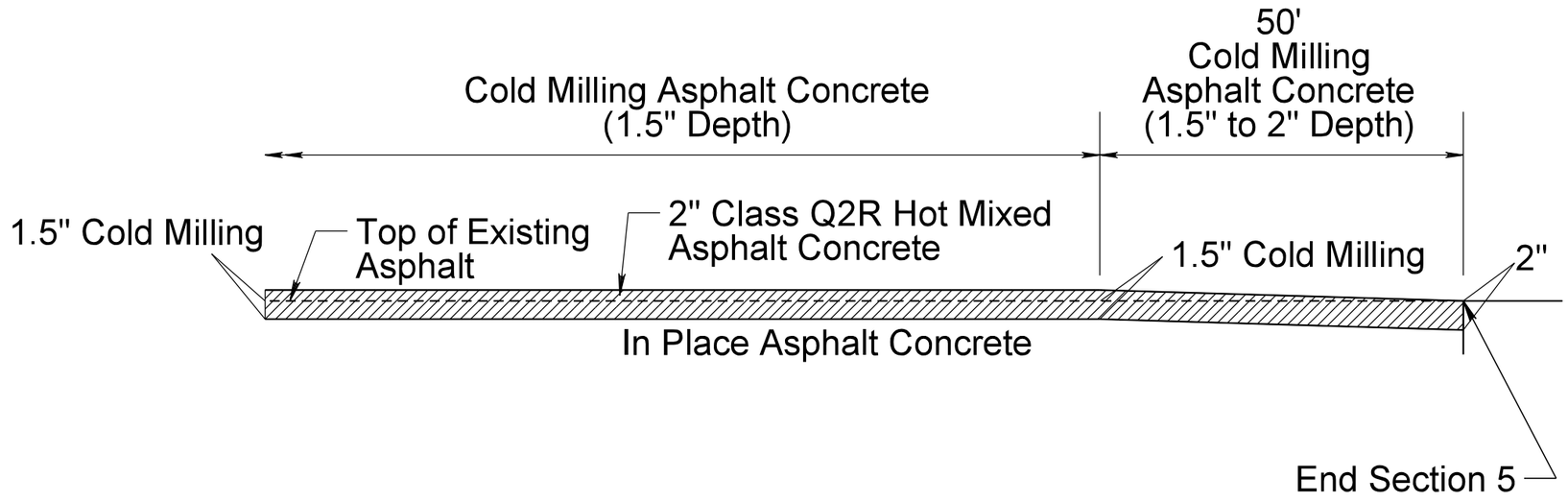
Plotted From - trrc11610

File - ...\pn\Bute05P7\design\gr05p7.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	26	45

Plotting Date: 09/29/2016

COLD MILLING ASPHALT CONCRETE
END OF PROJECT



Plot Scale - 1:20

Plotted From - trnc11610

File - ...\design\cold milling.dgn

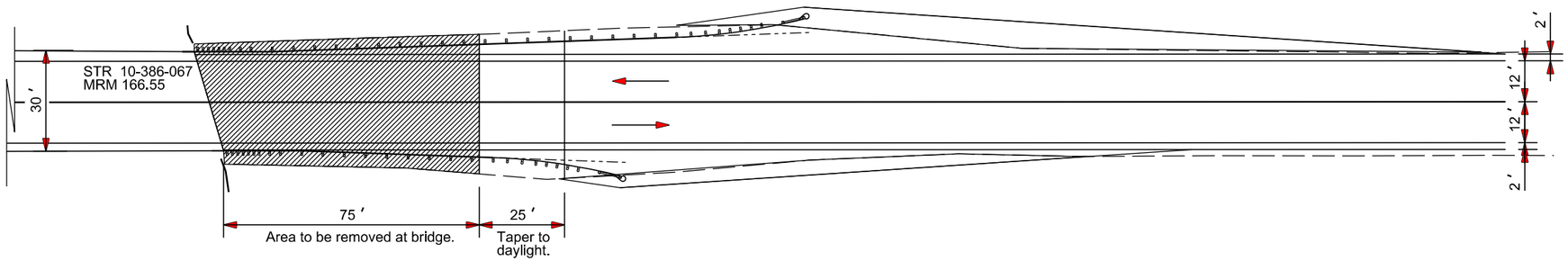
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	27	45

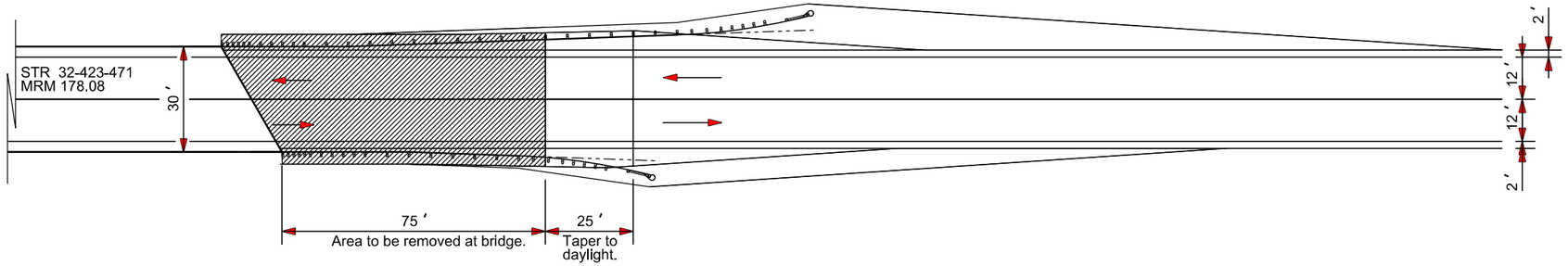
Plotting Date: 09/29/2016

BRIDGE APPROACH LAYOUT

See Bridge Approach Detail Sheet for details

Typical begin and end bridge layout





Plot Scale - 1:40

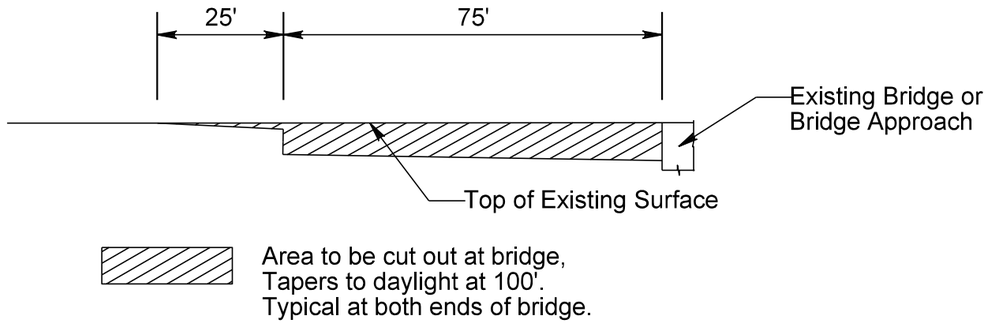
Plotted From - trnc11610

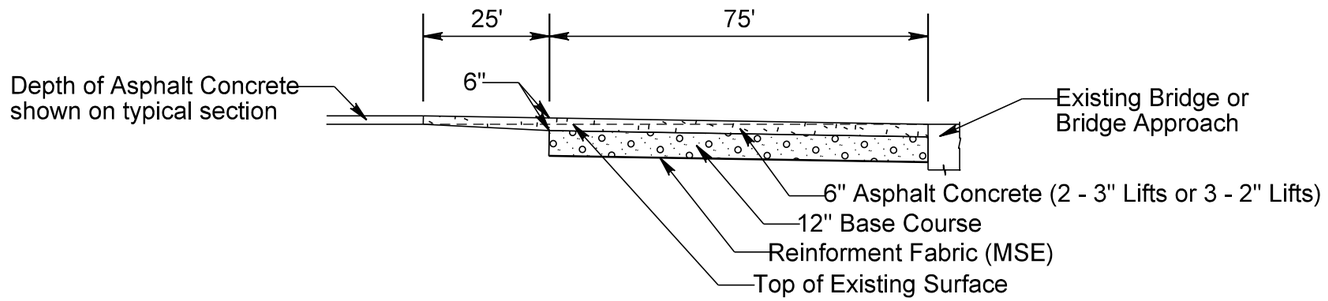
File - ...\design\bridge approach.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	28	45

Plotting Date: 09/29/2016

DETAIL FOR BRIDGE APPROACH





NOTES REGARDING BRIDGE APPROACHES

In order to construct the new surface flush with the top of the bridge and to provide depth for additional asphalt concrete, It will be necessary to cut out the existing base course to the limits shown on the layout above. The excavated material shall be wasted as directed by the Engineer.

In locations where the guardrail is being replaced the 12 inches of base course shall be taken out to the inslopes.

Any damage to the bridges shall be at the Contractor's expense.

See Table of Additional Quantities.

Plot Scale - 1:30

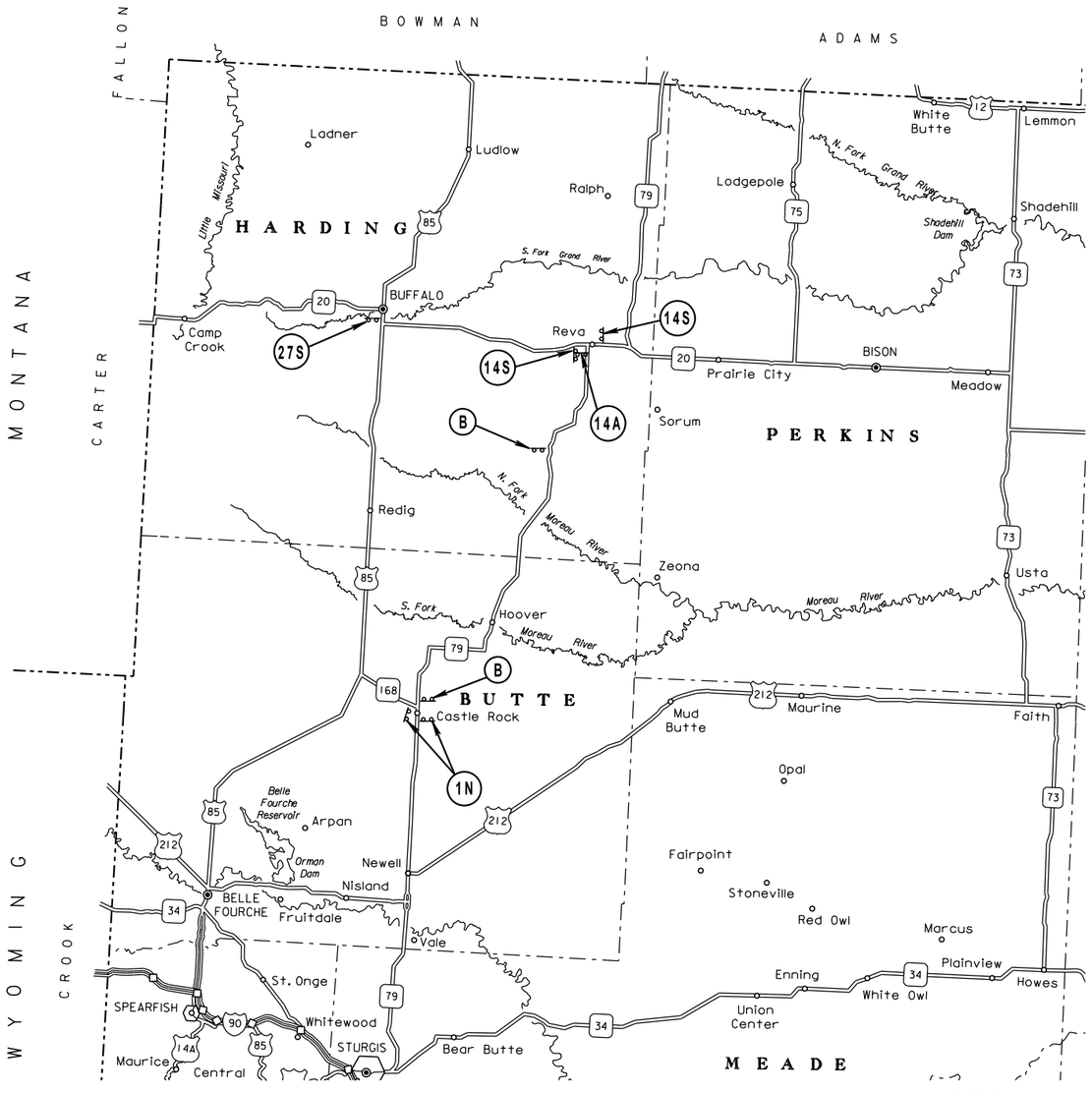
Plotted From - trrc11610

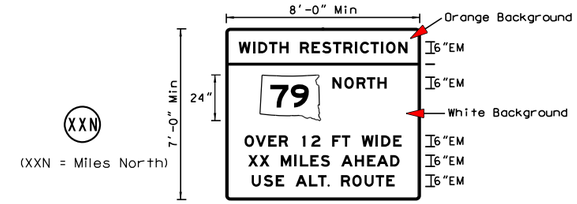
File - ...\Bridge Approach Detail 12_2013.dgn

OVERWIDTH DETOUR LAYOUT

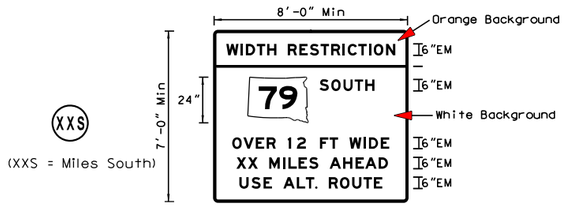
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	29	45

Plotting Date: 09/29/2016

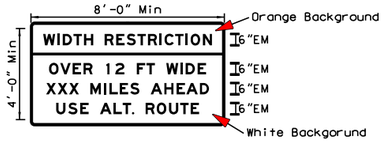




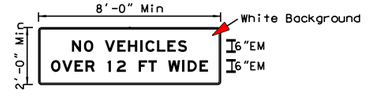
XXN (XXN = Miles North)



XXS (XXS = Miles South)



XXA

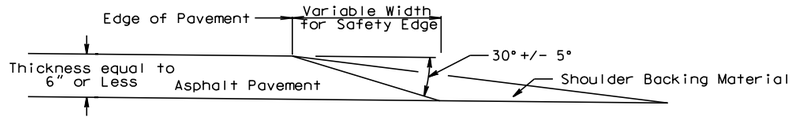


B

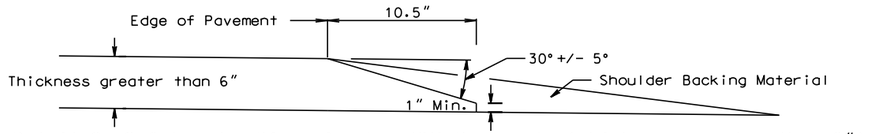
NOTES:
EXACT LOCATION OF SIGNS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. SIGNS TO BE FURNISHED, INSTALLED, MAINTAINED, AND REMOVED BY THE CONTRACTOR.
LETTER SIZE AND SPACING SHALL CONFORM TO THE M.U.T.C.D..
SIGN FACE SHALL BE ORANGE (TYPE XI) AND WHITE (TYPE IV) SHEETING WITH BLACK VINYL LETTERING.

Plot Scale - 1:200
Plotted From - trrc11610
File - ...\design\overwidth detour.dgn

SAFETY EDGE CONFIGURATION FOR ASPHALT PAVEMENTS



Detail 1: Safety Edge Dimension For HMA Pavements (Thickness 6" or Less)



Detail 2: Safety Edge Dimension For HMA Pavements (Thickness greater than 6")

GUIDE SPECIFICATION FOR SAFETY EDGE CONSTRUCTION WITH HOT MIX ASPHALT PAVEMENTS

When specified in the plans an approved longitudinal paver wedge system shall be included to create a sloped safety edge along the outside edge of the asphalt concrete pavement. The wedge system shall be attached to the paver screed and shall compact the hot mixed asphalt pavement (HMA) to a density at least as dense as the compaction imparted to the rest of the HMA by the paving screed.

The system shall provide a sloped Safety Edge equal to 30° plus or minus 5° measured from the extended pavement surface cross slope. The safety edge must be constructed as an integral operation in the paving process and in accordance with the attached Detail.

The use of a single plate strike-off method to construct the safety edge will not be allowed.

The Engineer may allow the Contractor to use handwork for short sections or to saw cut the sloped safety edge after paving operations are complete in areas such as driveways, intersections, and interchanges.

The Contractor shall submit the proposed system for approval by the Engineer at the Preconstruction Meeting. The Engineer may require proof that the system has been used on previous projects with acceptable results or may require a test section to be constructed prior to the beginning of work to demonstrate that it can create an acceptable safety wedge and compaction. Paving shall not begin until the system is approved in writing by the Engineer. The safety edge shall be constructed on each lift of HMA specified in the plans.

The safety edge device shall be attached to the paving machine as recommended by the supplier. The device shall use a spring loaded shoe that constrains the asphalt head, thus increasing the density of the extruded profile. The shoe shall be capable of applying variable pressure to ensure some compaction of the edge during the paving operation. Currently there is a least four manufactures producing equipment that can create a Safety Edge (see list below). The Engineer may permit an approved equal.

Transtech Systems, Inc.
1594 State Street
Schenectady, NY 12304
Phone: 1-800-724-6306 or 1-518-370-5558
www.transtechsys.com

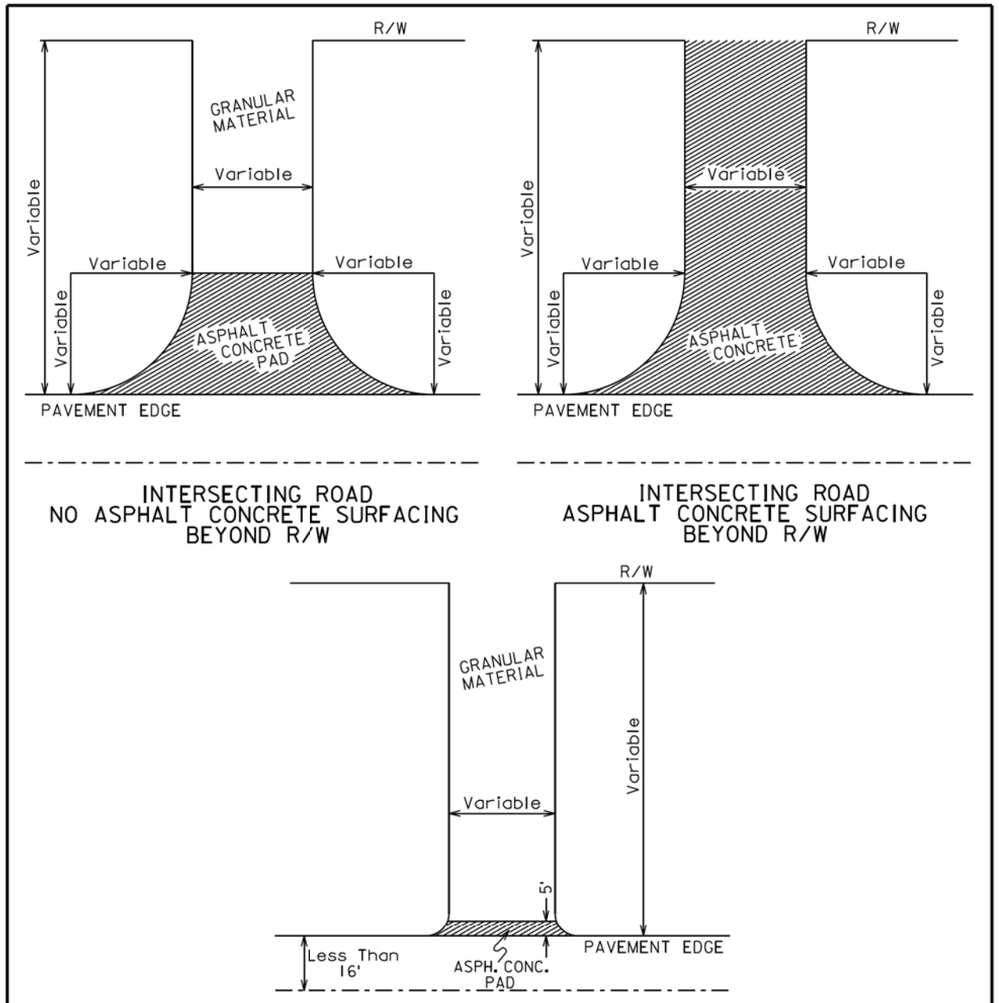
Carlson Paving Products
18425 50th Ave. E
Tacoma WA 98446
Phone: 1-253-278-9426
http://www.carlsonpavingproducts.com

Advant-Edge Paving Equipment LLC
1197 Hillside Avenue, Suite B47
Niskayuria, NY 12309
Phone: 1-518-280-6090
www.advantagepaving.com

Troxler Electronic Laboratories, Inc.
3008 E. Cornwallis Rd. • PO Box 12057
Research Triangle Park, NC 27709
Phone: 1-877-876-9537
http://www.troxlerlabs.com/products/paving.php

Separate measurement and payment will not be made; all work associated with furnishing and constructing the safety edge shall be incidental to the Asphalt Concrete Placement Bid Item.

SAFETY EDGE
FOR ASPHALT PAVEMENTS

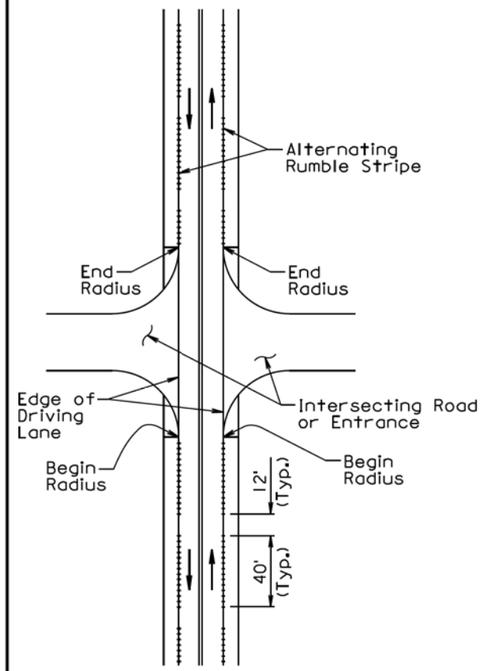


The surfacing details shown on this sheet are provided as a guide for surfacing these facilities. The precise construction limits for situations other than the standards shown will be determined by the Engineer, at the time of construction.

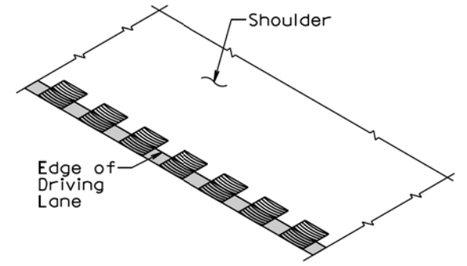
ROADWAY WITH OR WITHOUT SHOULDER

March 31, 2000

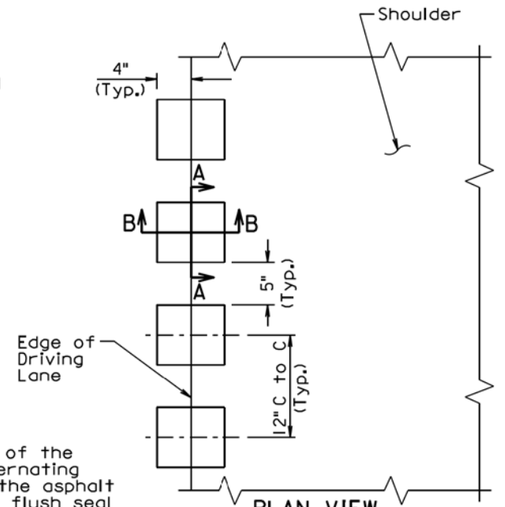
Published Date: 3rd Qtr. 2016	SDDOT	RESURFACING OF INTERSECTING ROADS AND ENTRANCES	PLATE NUMBER 320.10
			Sheet 1 of 1



PLAN VIEW



PERSPECTIVE OF TYPICAL
RUMBLE STRIPE IN ASPHALT CONCRETE



PLAN VIEW
TYPICAL RUMBLE STRIPE
IN ASPHALT CONCRETE

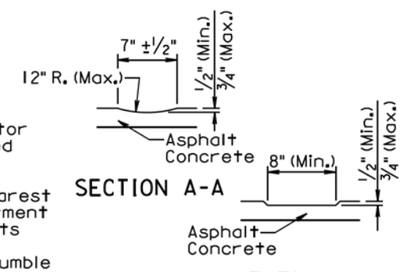
GENERAL NOTES:

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

A rumble stripe 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 stripe adjacent to the intersecting roads, entrances, and turnouts shall be adjusted as approved by the Engineer.

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

Measurement of the rumble stripe shall be to the nearest 0.1 of a mile for each shoulder. Measurement and payment of the rumble stripe shall include the 12' long segments without rumble stripes and the segments adjacent to intersecting roads, entrances, and turnouts without rumble stripes. Payment for constructing the rumble stripe shall be at the contract unit price per mile for "Grind 8" Rumble Strip or Stripe in Asphalt Concrete".

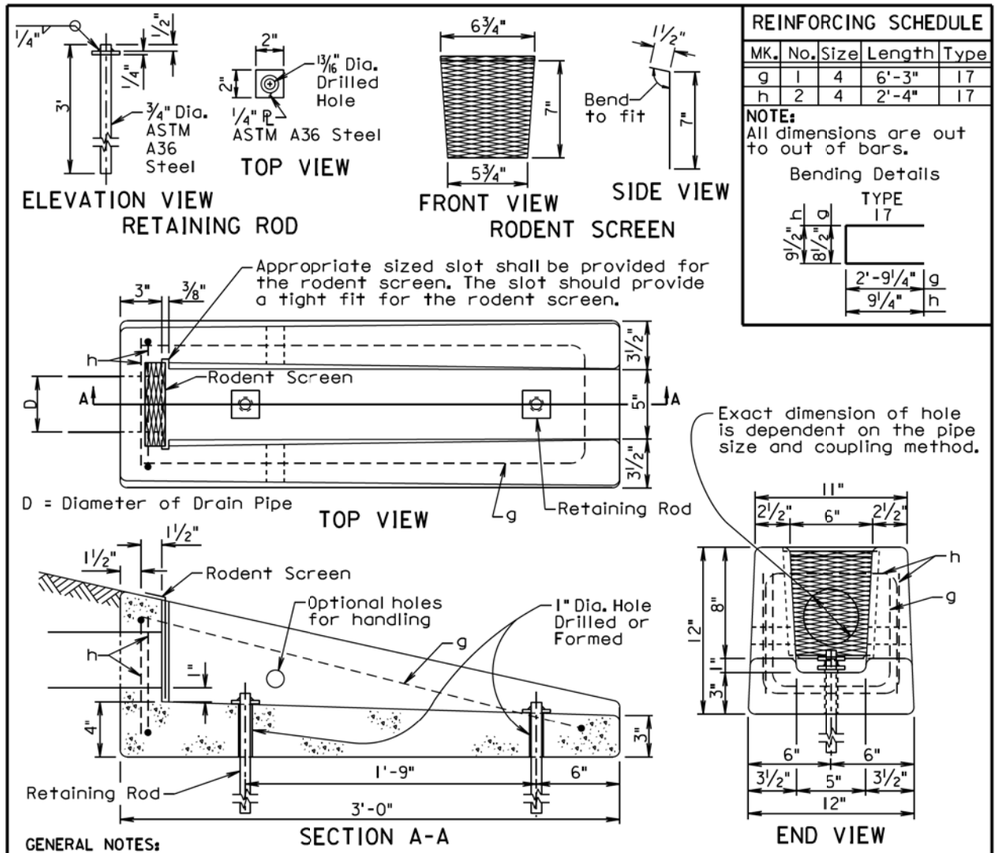


SECTION A-A

SECTION B-B

June 26, 2011

Published Date: 3rd Qtr. 2016	SDDOT	8" RUMBLE STRIPE IN ASPHALT CONCRETE ON NONDIVIDED HIGHWAY SHOULDERS	PLATE NUMBER 320.20
			Sheet 1 of 1



REINFORCING SCHEDULE				
MK.	No.	Size	Length	Type
g	1	4	6'-3"	17
h	2	4	2'-4"	17

NOTE:
All dimensions are out to out of bars.

Bending Details

GENERAL NOTES:

The concrete shall be Class M6. The concrete shall conform to the requirements of Section 462 of the Specifications. It is estimated that each unit weighs approximately 210 pounds.

All reinforcing steel shall conform to ASTM A615 Grade 60 and shall be epoxy coated. The reinforcing steel shall be securely retained to prevent displacement during placement of concrete. It is estimated that 7.3 pounds of reinforcing steel is required for each unit.

The pipe shall be placed in the concrete headwall with the pipe end flush with the concrete surface adjacent to the rodent screen.

The rodent screen shall be galvanized 13 Ga. steel with a diamond shaped flattened mesh pattern. The size shall be 1/2". The size refers to the measurement across the smallest diamond shaped opening measured from the centers of the wires.

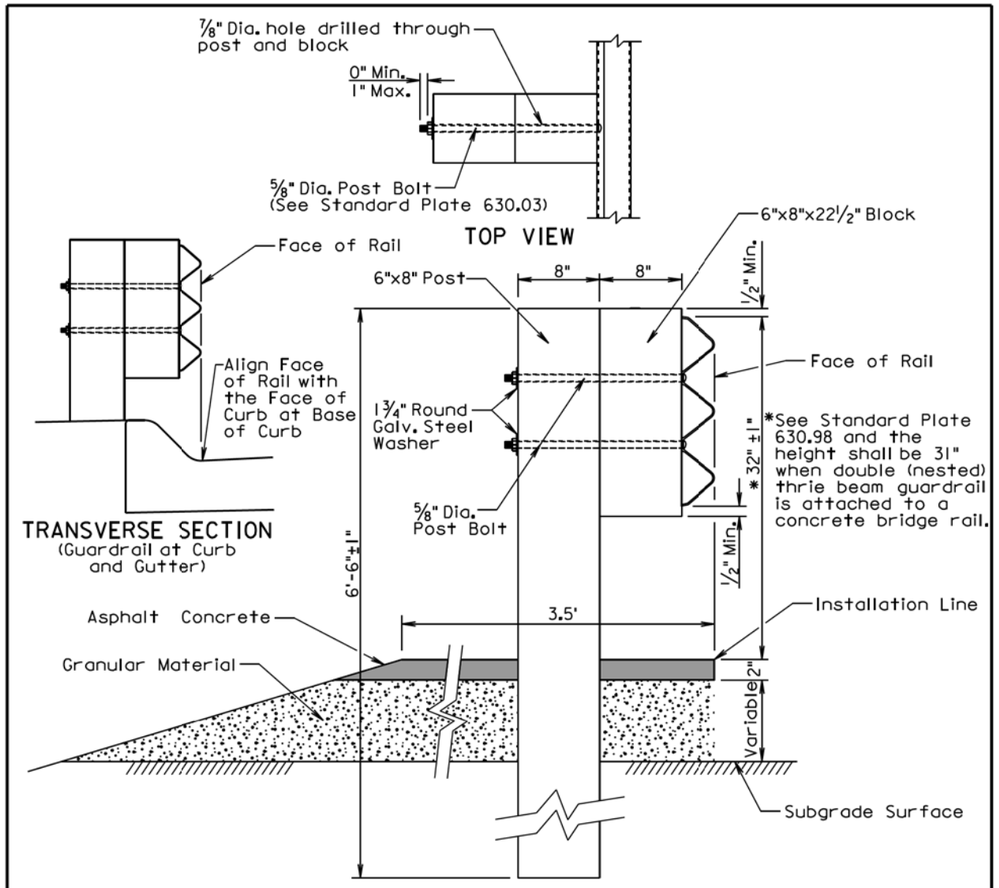
The retaining rod shall be galvanized in accordance with ASTM A123 after all shop welding has been completed.

The drawing indicates using 1/2" fillets; however, 3/4" chamfers may be substituted for the 1/2" fillets.

All costs for furnishing and installing the concrete headwall including equipment, labor, and materials including concrete, reinforcing steel, retaining rods, and rodent screen shall be incidental to the contract unit price per each for "Precast Concrete Headwall for Drain".

June 26, 2015

Published Date: 3rd Qtr. 2016	SDDOT	***PRECAST CONCRETE HEADWALL FOR DRAIN***	***PLATE NUMBER*** 430.50 *Sheet 1 of 1*



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.

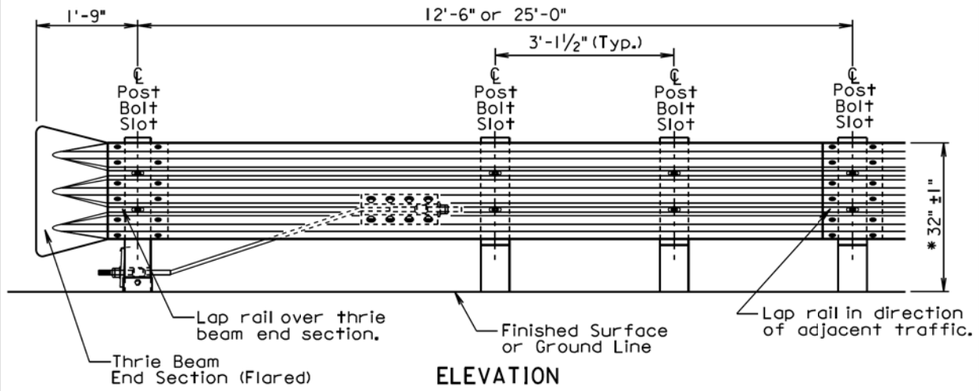
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline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

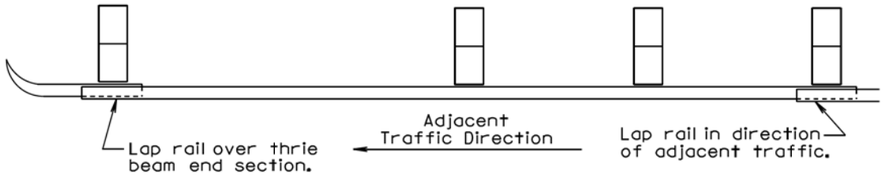
June 26, 2015

Published Date: 3rd Qtr. 2016	SDDOT	***THRIE BEAM GUARDRAIL POST INSTALLATION***	***PLATE NUMBER*** 630.01 *Sheet 1 of 1*



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'-1½"	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.

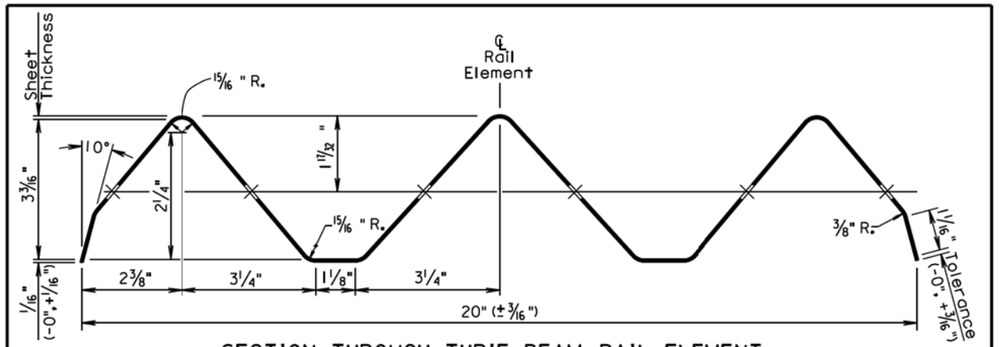
Thrie beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

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.

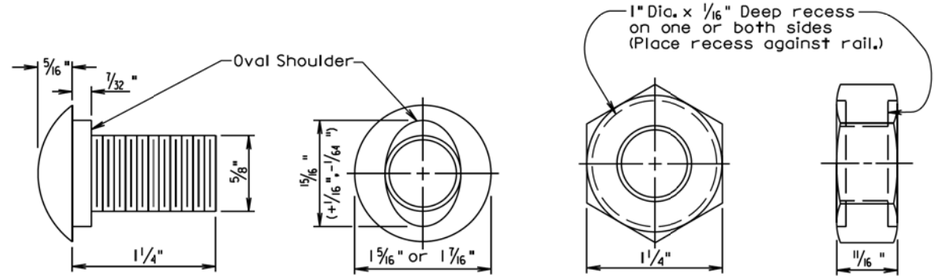
All costs for constructing thrie beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

June 26, 2015

Published Date: 3rd Qtr. 2016	SDDOT	THRIE BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.02
			Sheet 1 of 1

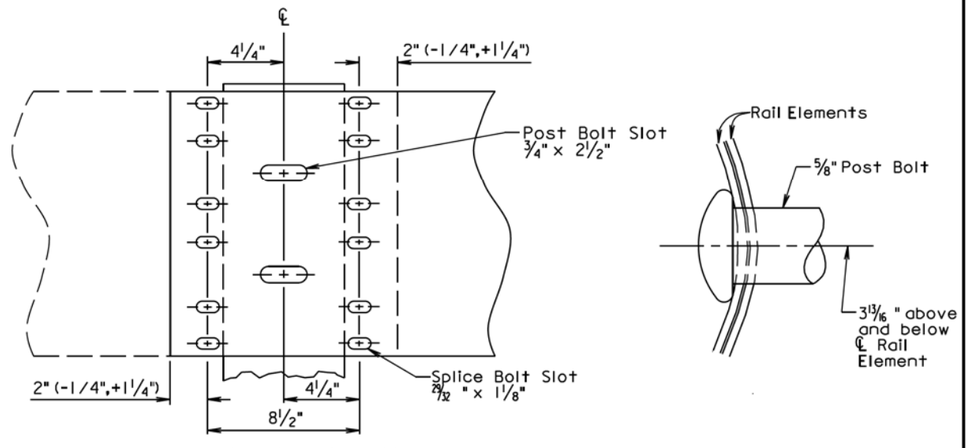


SECTION THROUGH THRIE BEAM RAIL ELEMENT



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

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

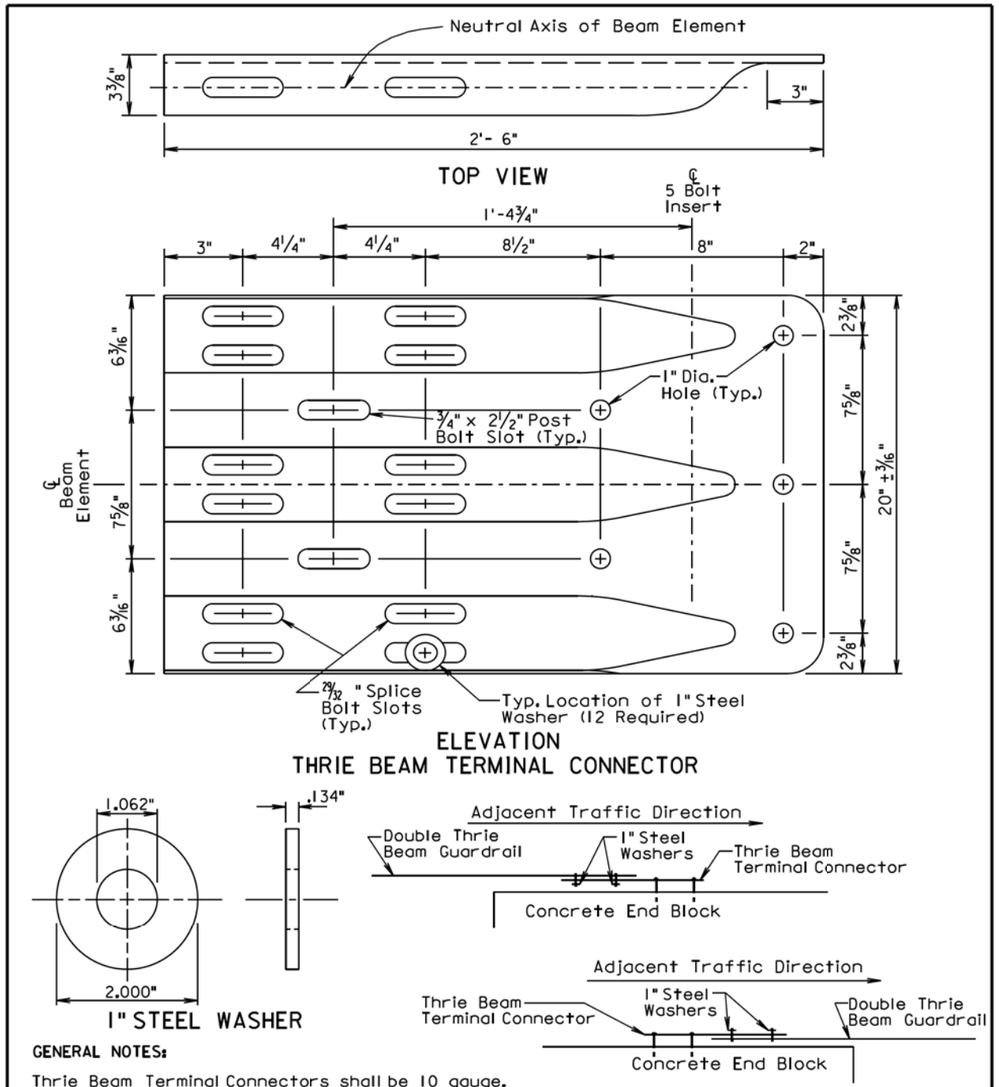


Lap in direction of traffic.

RAIL SPLICE

March 31, 2000

Published Date: 3rd Qtr. 2016	SDDOT	THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.03
			Sheet 1 of 1



GENERAL NOTES:

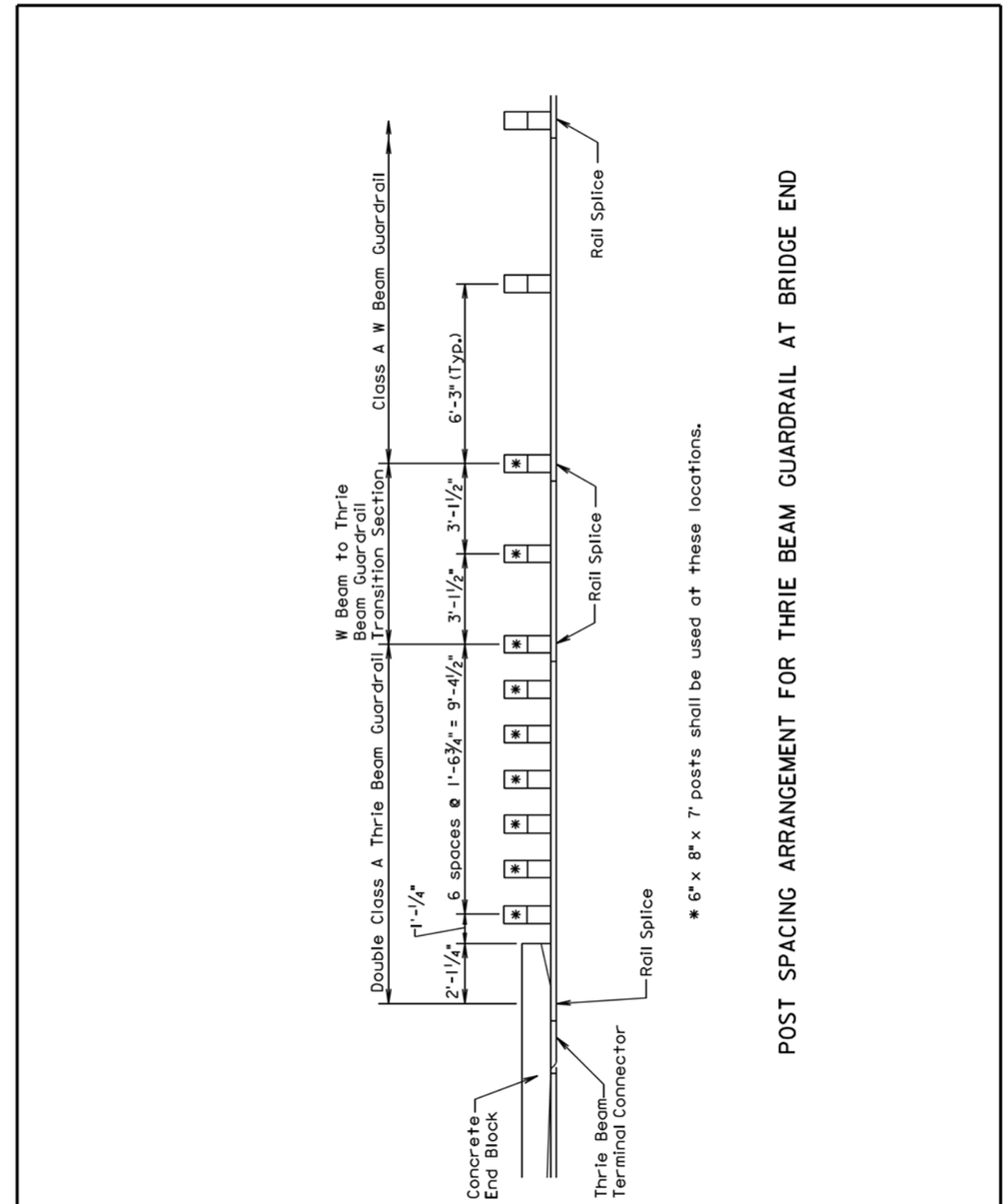
Thrie Beam Terminal Connectors shall be 10 gauge.

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

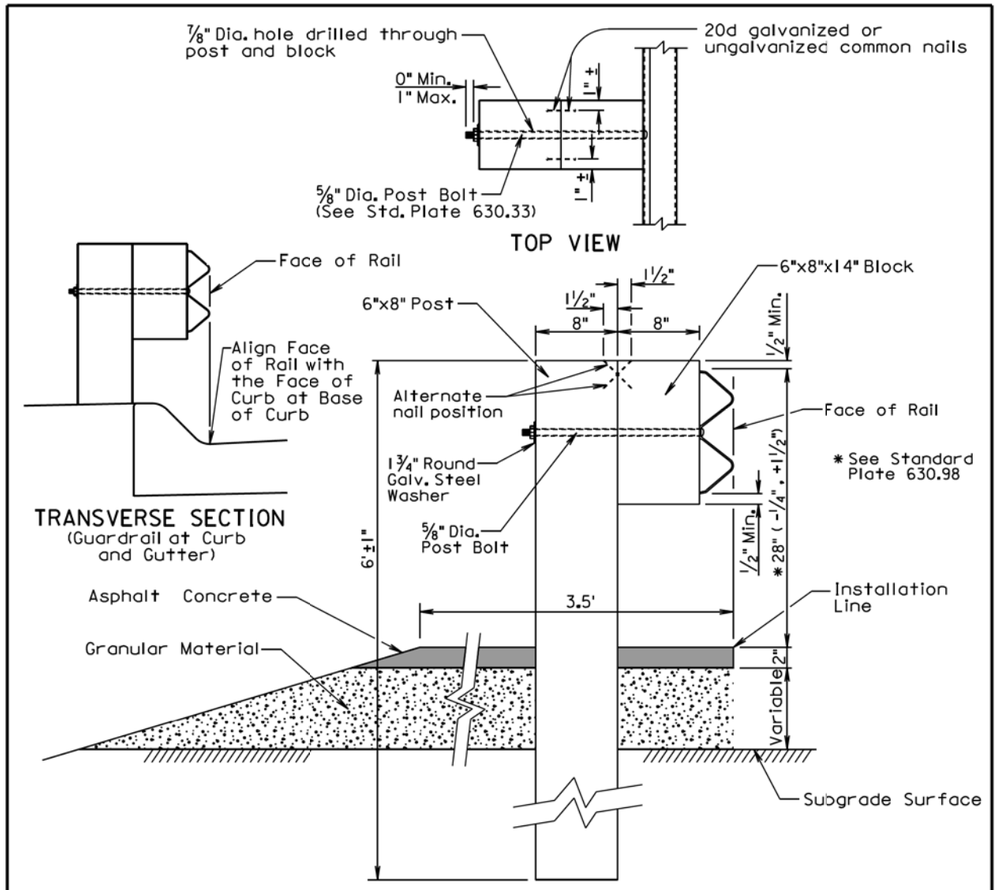
Published Date: 3rd Qtr. 2016	SDDOT	THRIE BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER	PLATE NUMBER 630.05
			Sheet 1 of 1



POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

Published Date: 3rd Qtr. 2016	SDDOT	POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END	PLATE NUMBER 630.15
			Sheet 1 of 1



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.

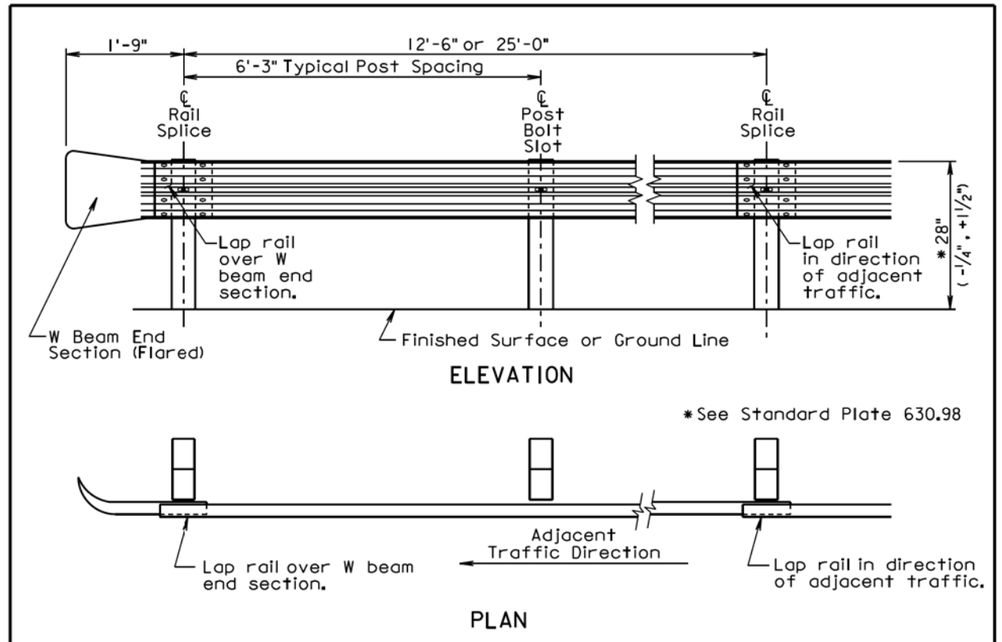
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline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

Published Date: 3rd Qtr. 2016	SDDOT	W BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.31 Sheet 1 of 1



W BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	5'-0"
3'-1½"	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.

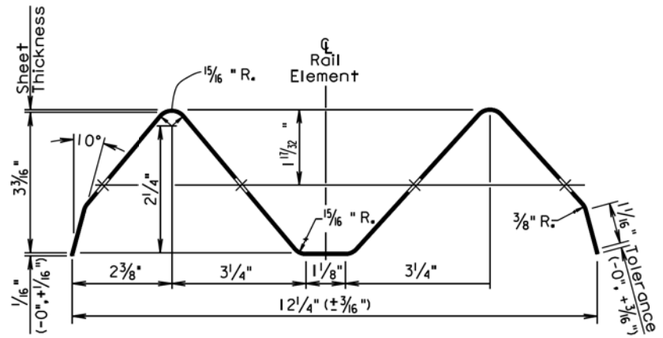
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

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.

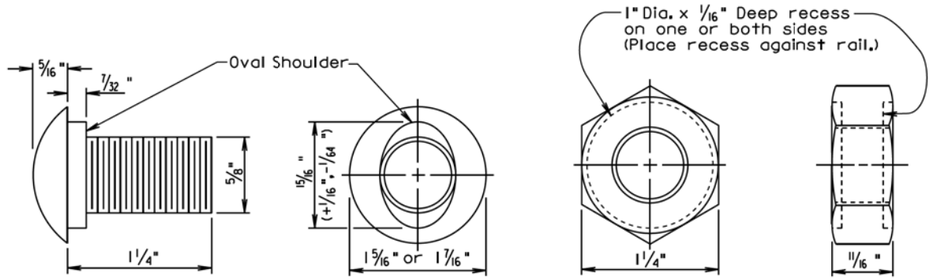
All costs for constructing W beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

June 26, 2015

Published Date: 3rd Qtr. 2016	SDDOT	W BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.32 Sheet 1 of 1

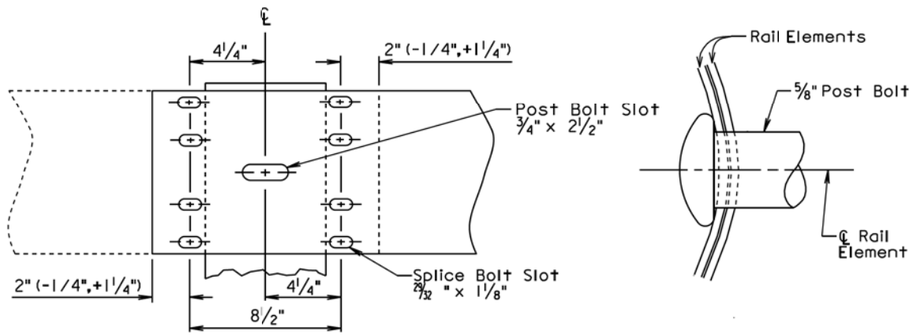


SECTION THROUGH W BEAM RAIL ELEMENT



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

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

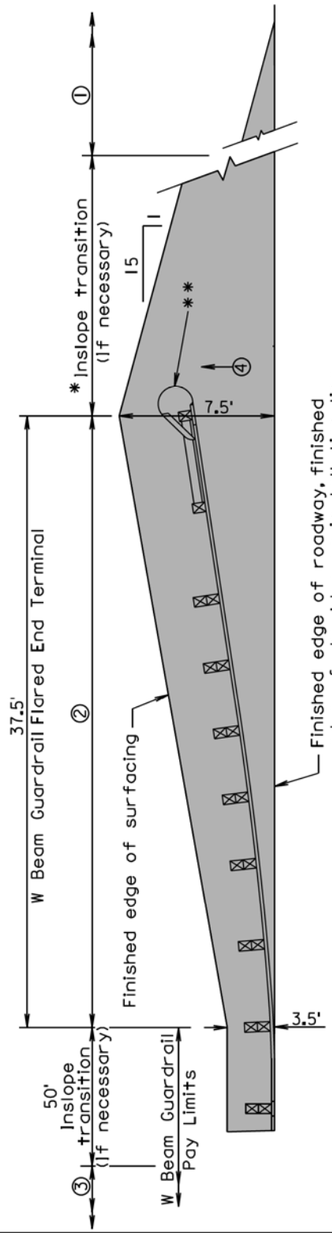


Lap in direction of traffic.

RAIL SPLICE

December 23, 2004

Published Date: 3rd Qtr. 2016	SDDOT	W BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.33
			Sheet 1 of 1



PLAN

* The length of inslope transition varies with the amount of change between inslopes. The length of the transition shall change 100' for every whole number change in the inslope. For Example: If the inslope changes from a 5:1 to a 4:1 the length of the inslope transition would be 100'. If the inslope changes from a 6:1 to a 4:1 the length of the inslope transition would be 200'.

① Same inslope as mainline inslope
② 4:1 inslope
③ 2:1 inslope or flatter, or inslope as specified in plans
④ Same slope as roadway cross slope

GENERAL NOTES:

The W beam guardrail flared end terminal shall be installed according to the manufacturer's installation instructions.

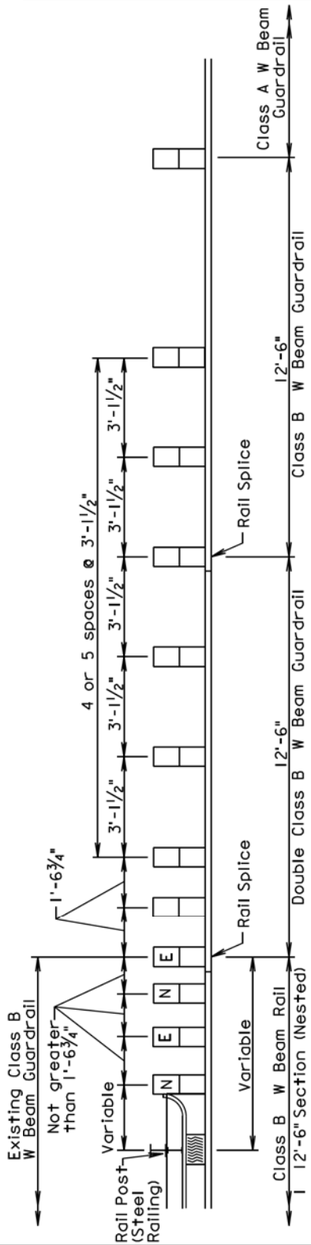
** An adhesive object marker shall be placed on the end section buffer or extruder after placement of the end section buffer or extruder. The adhesive dimensions may be 16" x 16" or other variation due to the shape of the end section buffer or extruder. A minimum of 256 square inches of object marker 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.

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.

December 16, 2014

Published Date: 3rd Qtr. 2016	SDDOT	EMBANKMENT AND SURFACING FOR W BEAM GUARDRAIL FLARED END TERMINAL	PLATE NUMBER 630.45
			Sheet 1 of 1

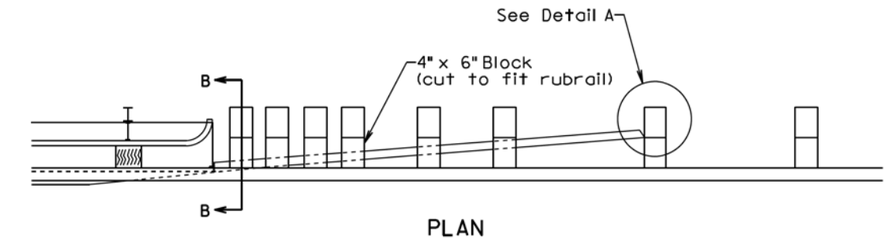


N = New post and block
E = Existing post and block

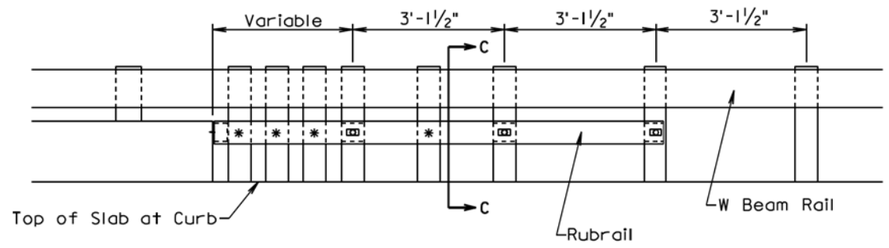
POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END
(W BEAM REALIGNMENT)

March 31, 2000

Published Date: 3rd Qtr. 2016	SDDOT	POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END (W BEAM REALIGNMENT)	PLATE NUMBER 630.58
			Sheet 1 of 1

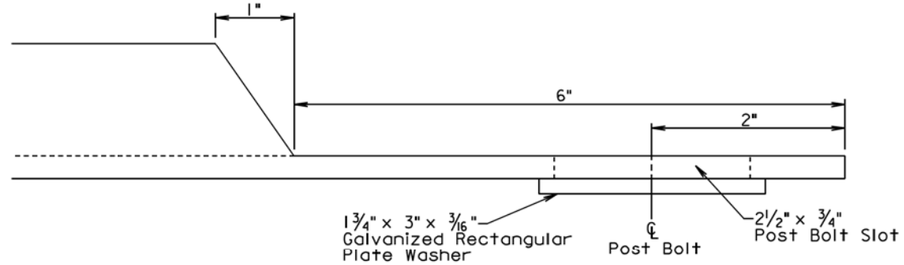


PLAN



*Rubrail does not have to be attached to these posts.

ELEVATION



DETAIL A
(Post, Block, and Post Bolt not shown)

GENERAL NOTES:

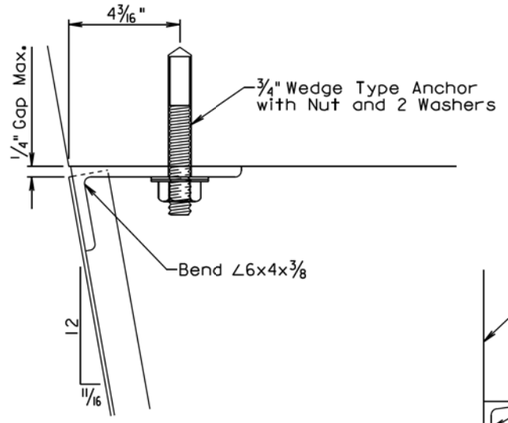
The steel shall be in conformance with ASTM A 36 and shall be galvanized after fabrication in conformance with ASTM A 123. If pre-galvanized steel members are used, all cuts and welds shall be coated with an approved galvanizing paint.

Offset blocks shall be in conformance with section 630 of the Standard Specifications.

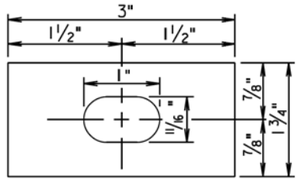
All hardware shall be in conformance with the requirements of AASHTO M 180.

March 31, 2000

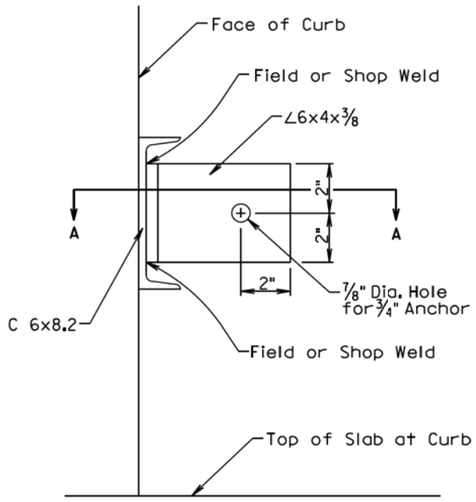
Published Date: 3rd Qtr. 2016	SDDOT	RUBRAIL AT BRIDGE END (W BEAM RETROFIT AND DRILLED IN ANCHOR)	PLATE NUMBER 630.78
			Sheet 1 of 2



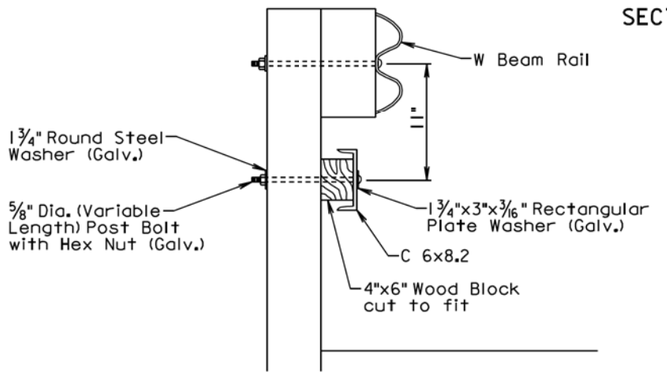
SECTION A-A



RECTANGULAR PLATE WASHER



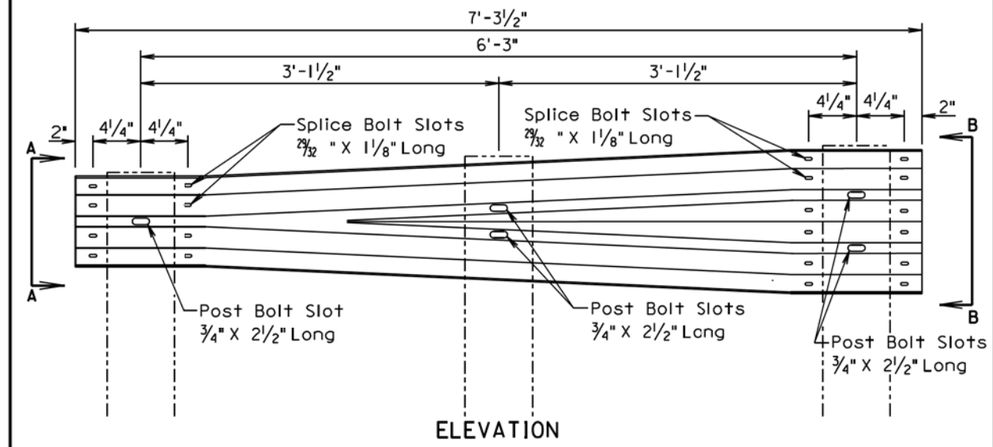
SECTION B-B



SECTION C-C

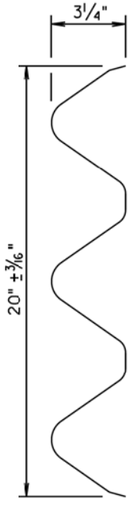
March 31, 2000

Published Date: 3rd Qtr. 2016	SDDOT	RUBRAIL AT BRIDGE END (W BEAM RETROFIT AND DRILLED IN ANCHOR)	PLATE NUMBER 630.78
			Sheet 2 of 2



ELEVATION

VIEW A-A



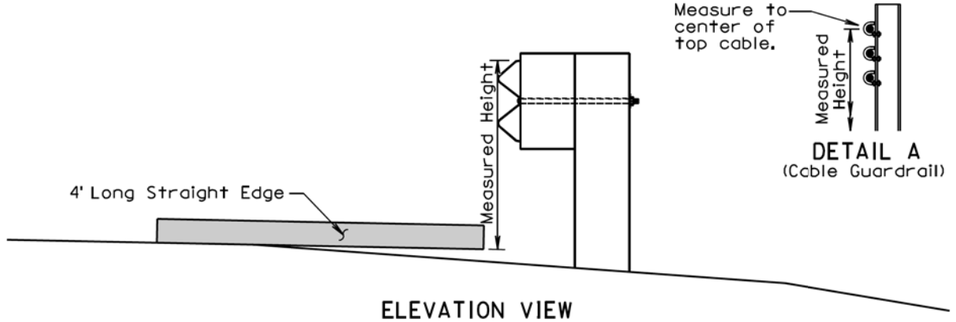
VIEW B-B

GENERAL NOTE:

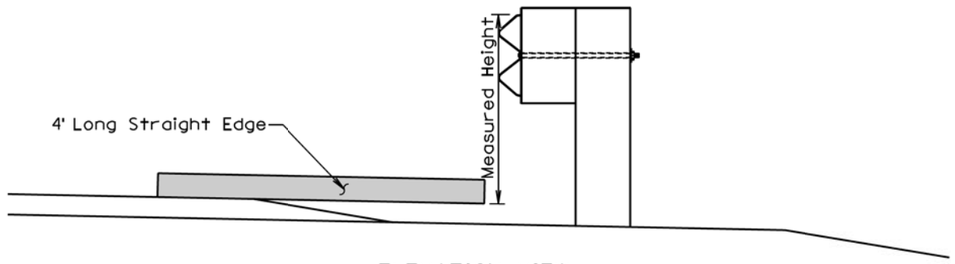
All costs for constructing the W Beam to Thrie Beam Guardrail Transition including labor, equipment, and materials including two posts, two blocks, W beam to thrie beam transition section, and hardware shall be incidental to the contract unit price per each for "W Beam to Thrie Beam Guardrail Transition".

March 31, 2000

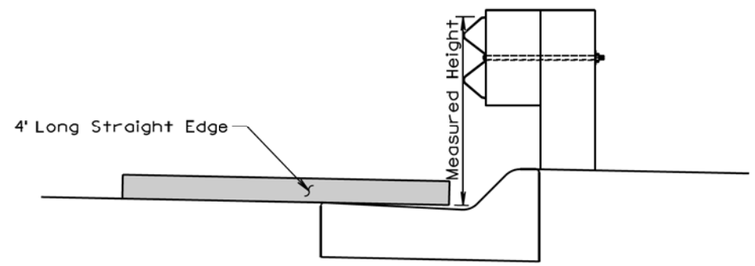
Published Date: 3rd Qtr. 2016	SDDOT	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.82
			Sheet 1 of 1



ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)



ELEVATION VIEW
(Guardrail Adjacent to Differential Surfacing Elevations)



ELEVATION VIEW
(Guardrail at Curb and Gutter)

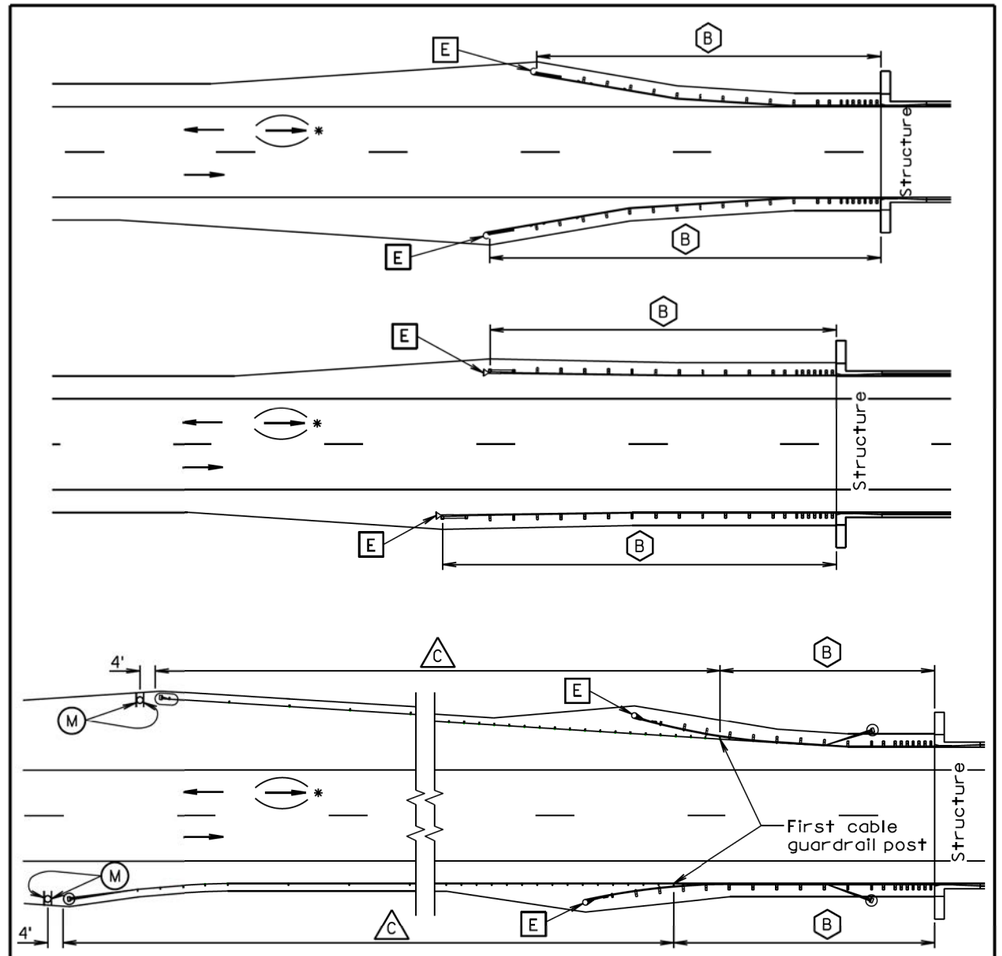
GENERAL NOTES:

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

Published Date: 3rd Qtr. 2016	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.98
			Sheet 1 of 1



TYPICAL GUARDRAIL LAYOUTS

(B) Steel Beam Guardrail Delineation

[E] Guardrail Terminal End Object Marker

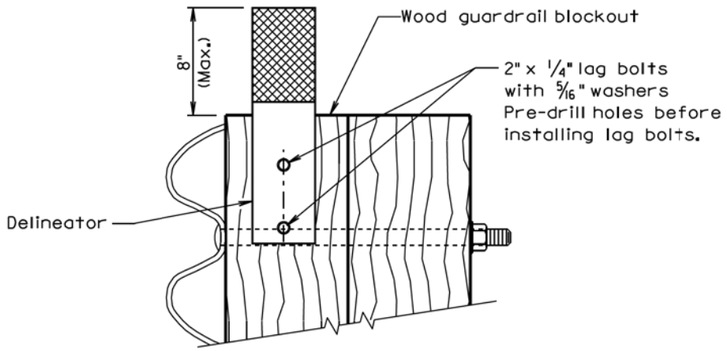
△C 3 Cable Guardrail Delineation

(M) Type 2 Object Marker

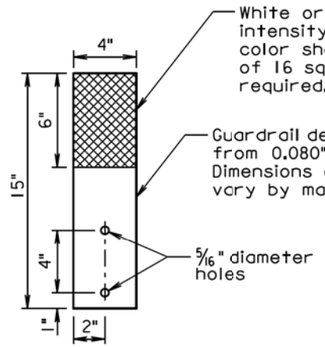
* For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-wcy traffic.

June 26, 2011

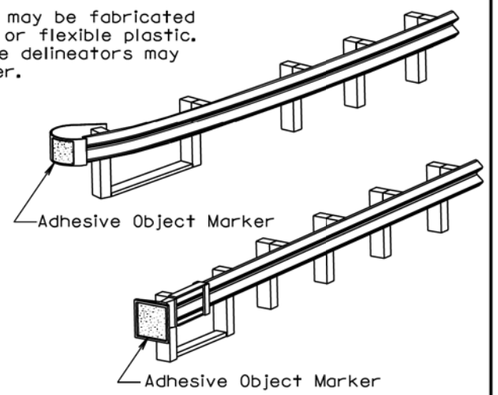
Published Date: 3rd Qtr. 2016	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 1 of 4



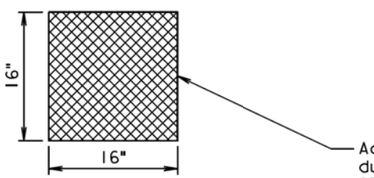
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)

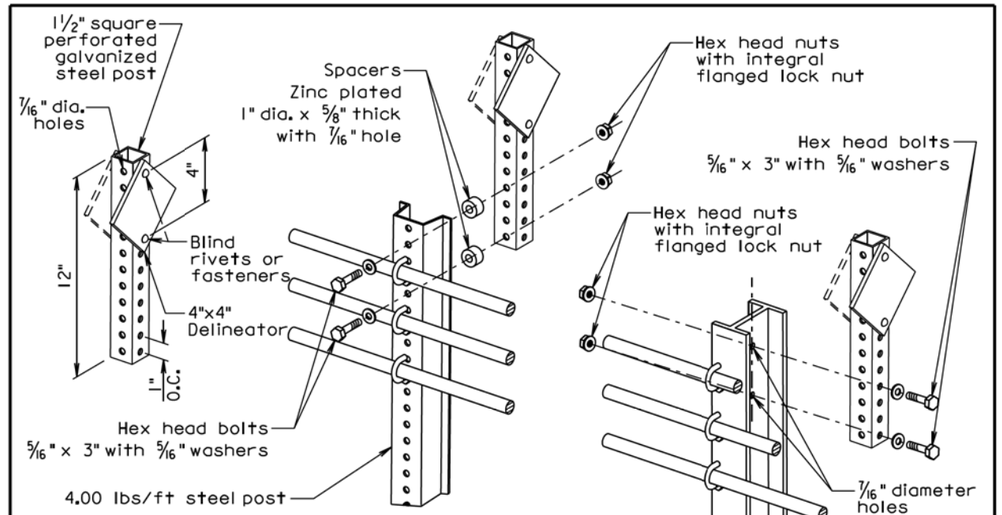


(E) GUARDRAIL TERMINAL END OBJECT MARKER

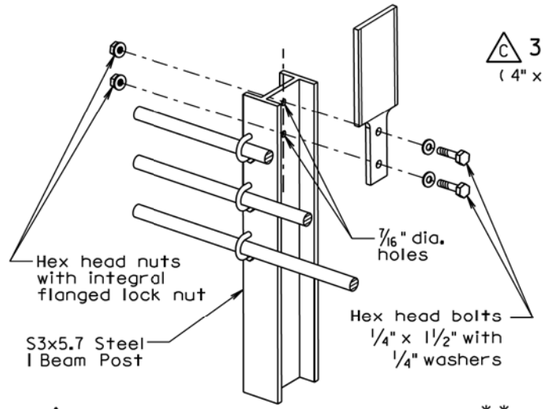


ADHESIVE OBJECT MARKER

June 26, 2011

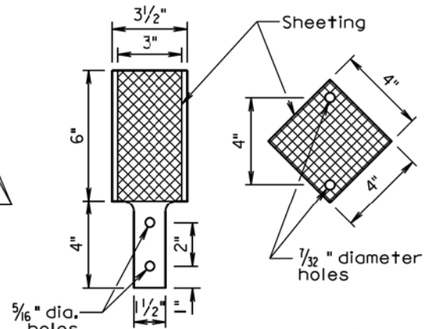


(C) 3 CABLE GUARDRAIL DELINEATION
(4" x 4" Delineator on Flanged Channel Steel Post)



(C) 3 CABLE GUARDRAIL DELINEATION
(4" x 4" Delineator on I Beam Steel Post)

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

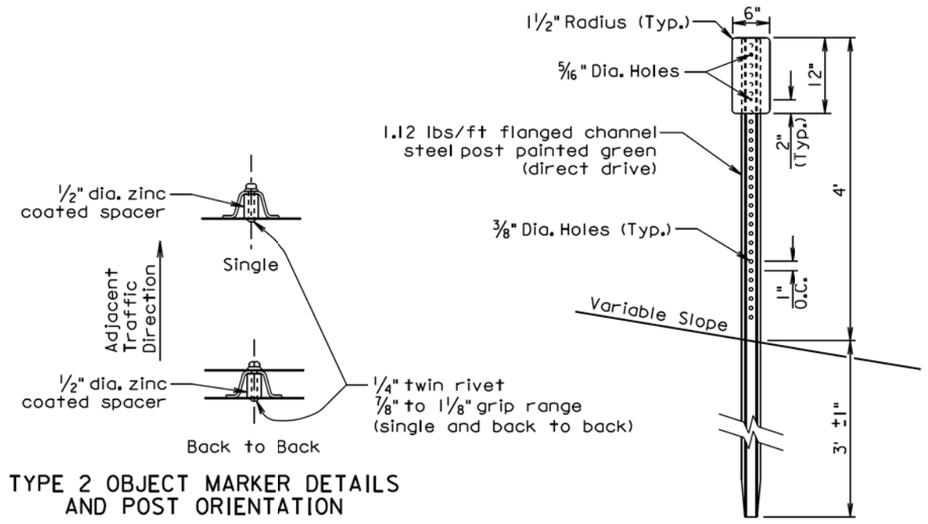


DELINEATORS***
(For 3 Cable Guardrail)

** 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

Ⓜ TYPE 2 OBJECT MARKER

(For Marking 3 Cable Guardrail Anchor)

GENERAL NOTES:

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

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

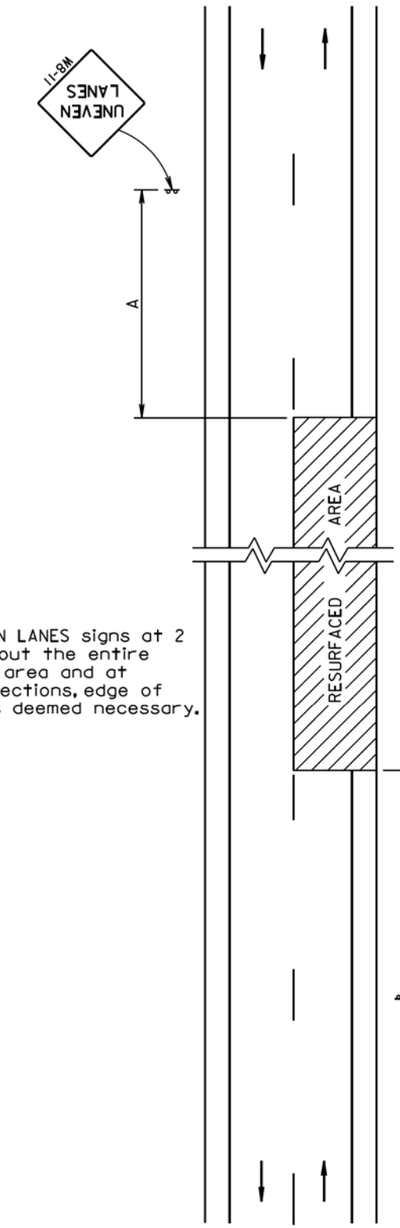
All costs for furnishing and installing single or back to back guardrail delineation shall be included in the contract unit price per each for "Guardrail Delineator".

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

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

June 26, 2011

Published Date: 3rd Qtr. 2016	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 4 of 4



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 75	1000

Install additional UNEVEN LANES signs at 2 mile intervals throughout the entire length of the uneven area and at affected major intersections, edge of towns, and other sites deemed necessary.

April 15, 2015

Published Date: 3rd Qtr. 2016	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES UNEVEN ROAD SURFACE	PLATE NUMBER 634.22
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P 0079(77)150	42	45

Plotting Date: 09/29/2016

Plot Scale - 1:200

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

Flagger

Channelizing Device

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

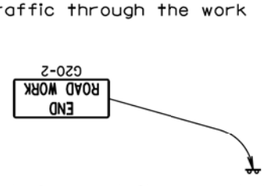
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

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

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

The channelizing devices shall be drums or 42" cones.

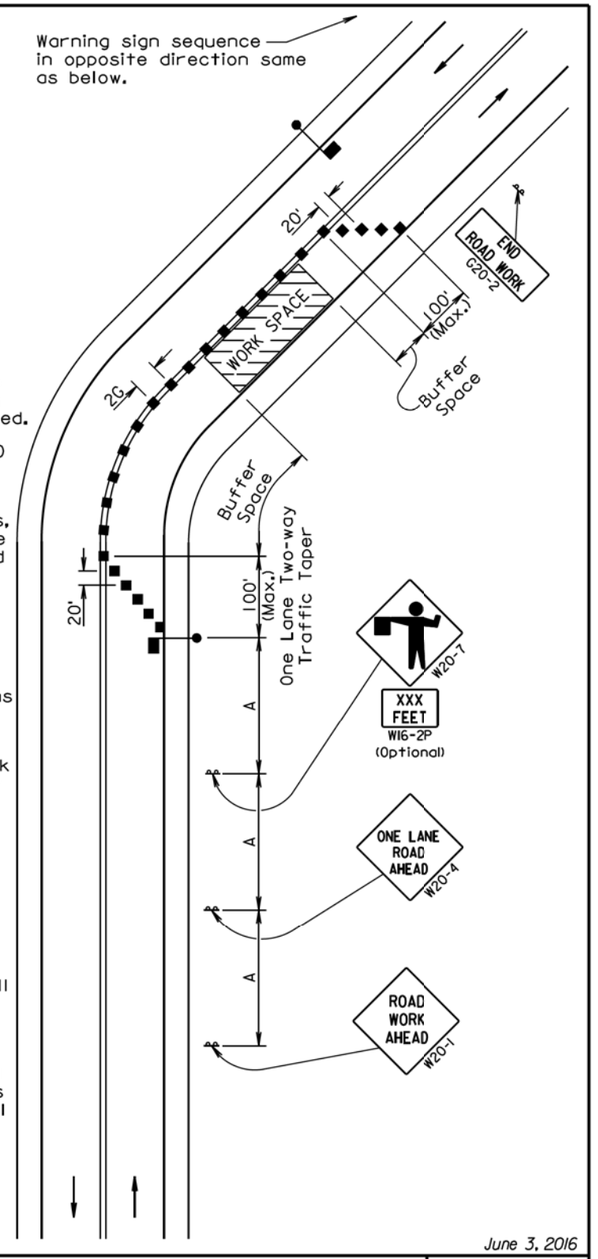
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



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

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

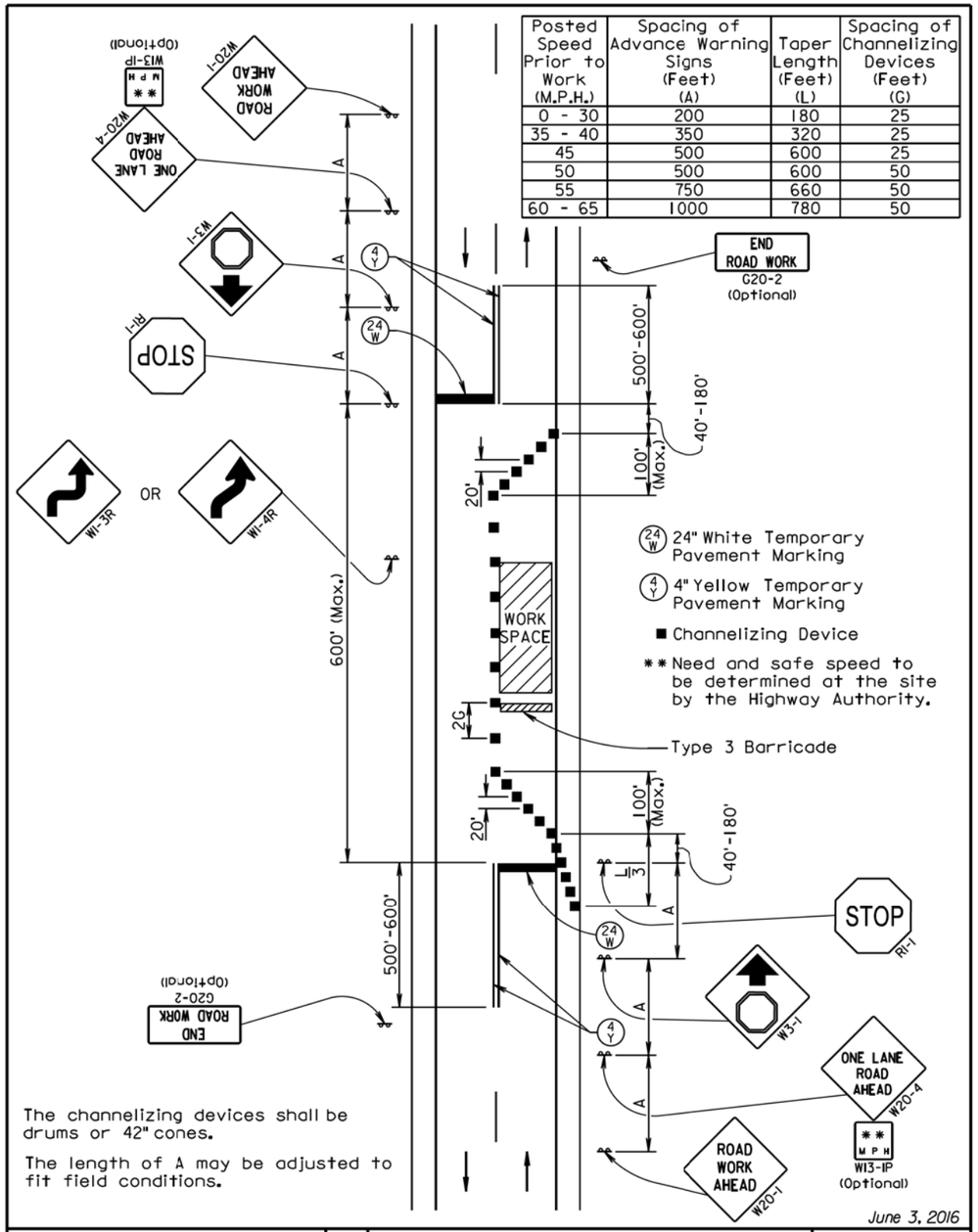
The length of A may be adjusted to fit field conditions.



June 3, 2016

Published Date: 3rd Qtr. 2016	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23 Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	180	25
35 - 40	350	320	25
45	500	600	25
50	500	600	50
55	750	660	50
60 - 65	1000	780	50



The channelizing devices shall be drums or 42" cones.

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

June 3, 2016

Published Date: 3rd Qtr. 2016	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE USING STOP SIGNS	PLATE NUMBER 634.25 Sheet 1 of 1

- Plotted From - trnc11610

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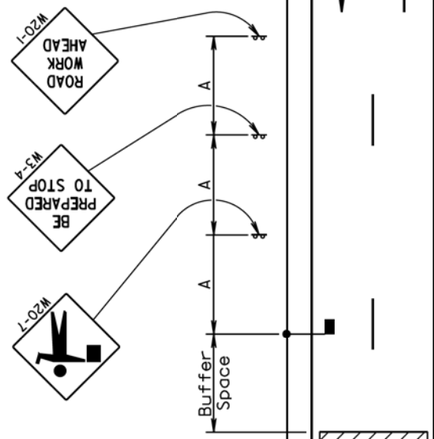


Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000

Flagger

END ROAD WORK
G20-2
(Optional)

Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645

Buffer space dependent on work site limitations.

Conditions represented are for work that requires closings during daytime hours only.

This application is intended for a planned temporary closing not to exceed 15 to 20 minutes.

September 6, 2015

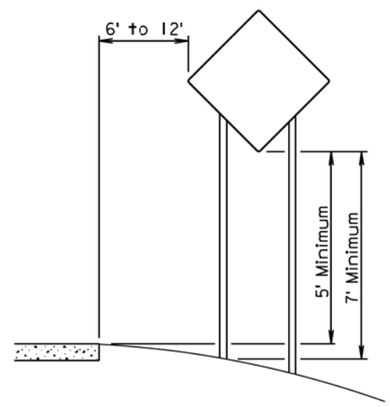
Published Date: 3rd Qtr. 2016

SDDOT

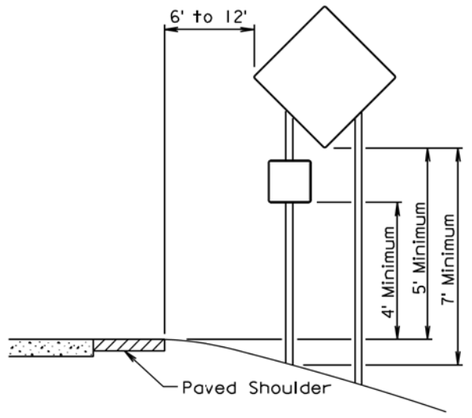
GUIDES FOR TRAFFIC CONTROL DEVICES TEMPORARY ROAD WORK

PLATE NUMBER 634.30

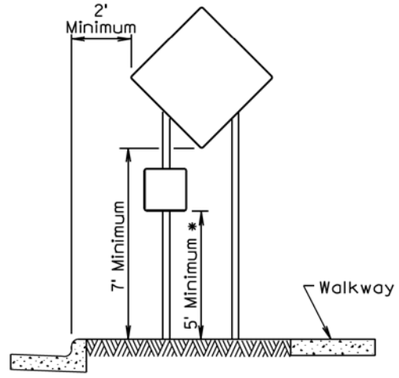
Sheet 1 of 1



RURAL DISTRICT

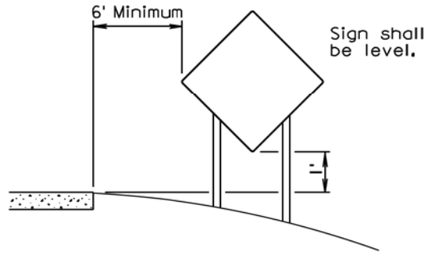


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



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

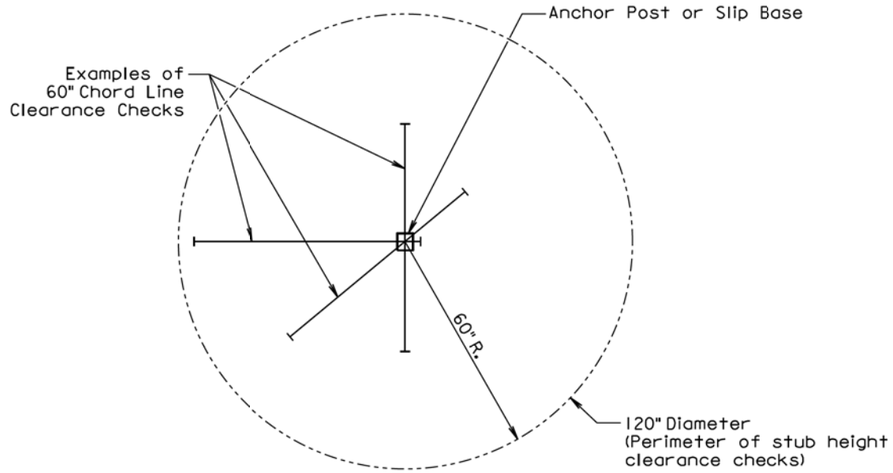
Published Date: 3rd Qtr. 2016

SDDOT

CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)

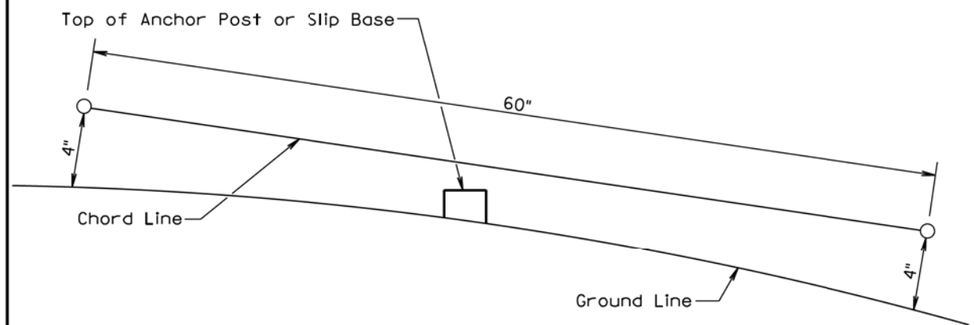
PLATE NUMBER 634.85

Sheet 1 of 1



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

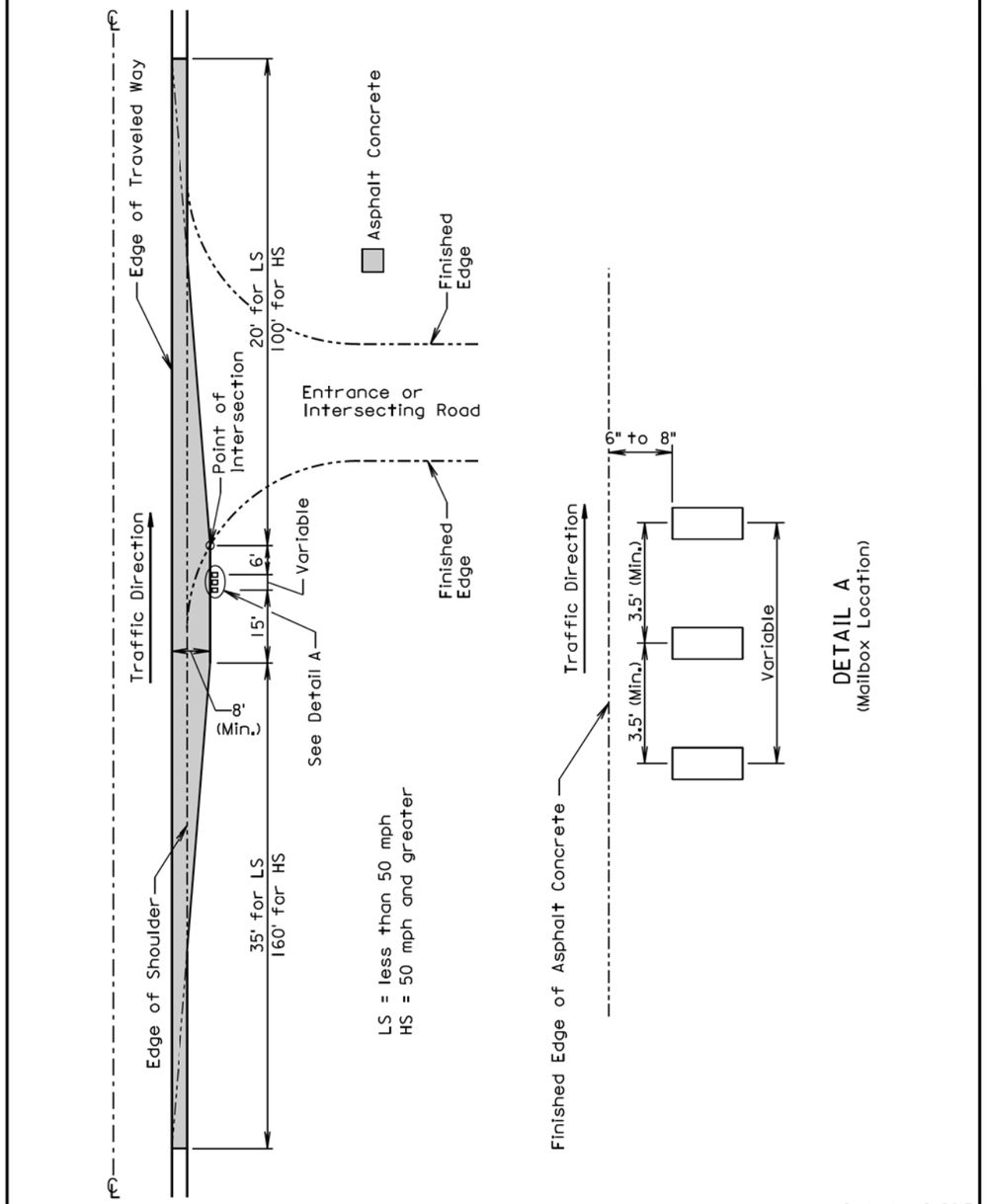
The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

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: 3rd Qtr. 2016	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

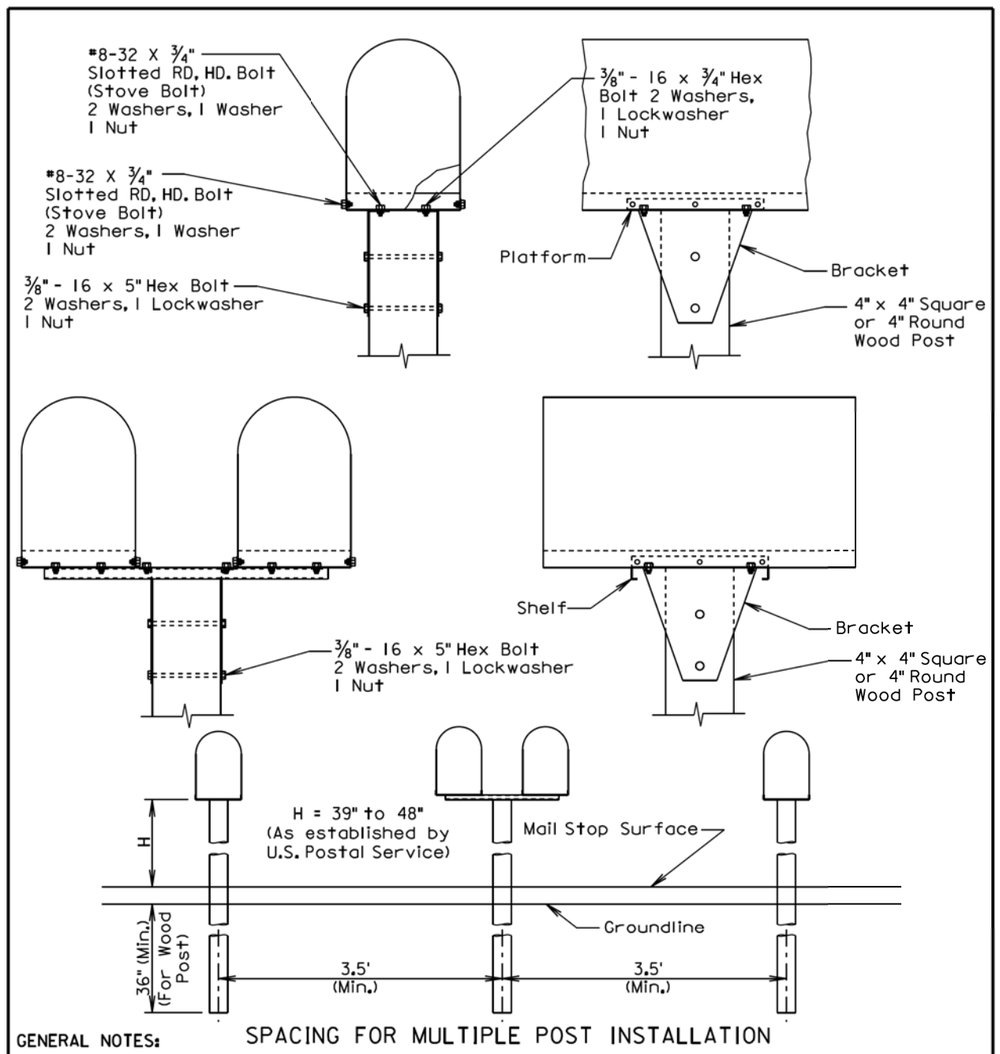


DETAIL A

(Mailbox Location)

September 6, 2015

Published Date: 3rd Qtr. 2016	SDDOT	MAILBOX TURNOUT	PLATE NUMBER 900.01
			Sheet 1 of 1



SPACING FOR MULTIPLE POST INSTALLATION

GENERAL NOTES:

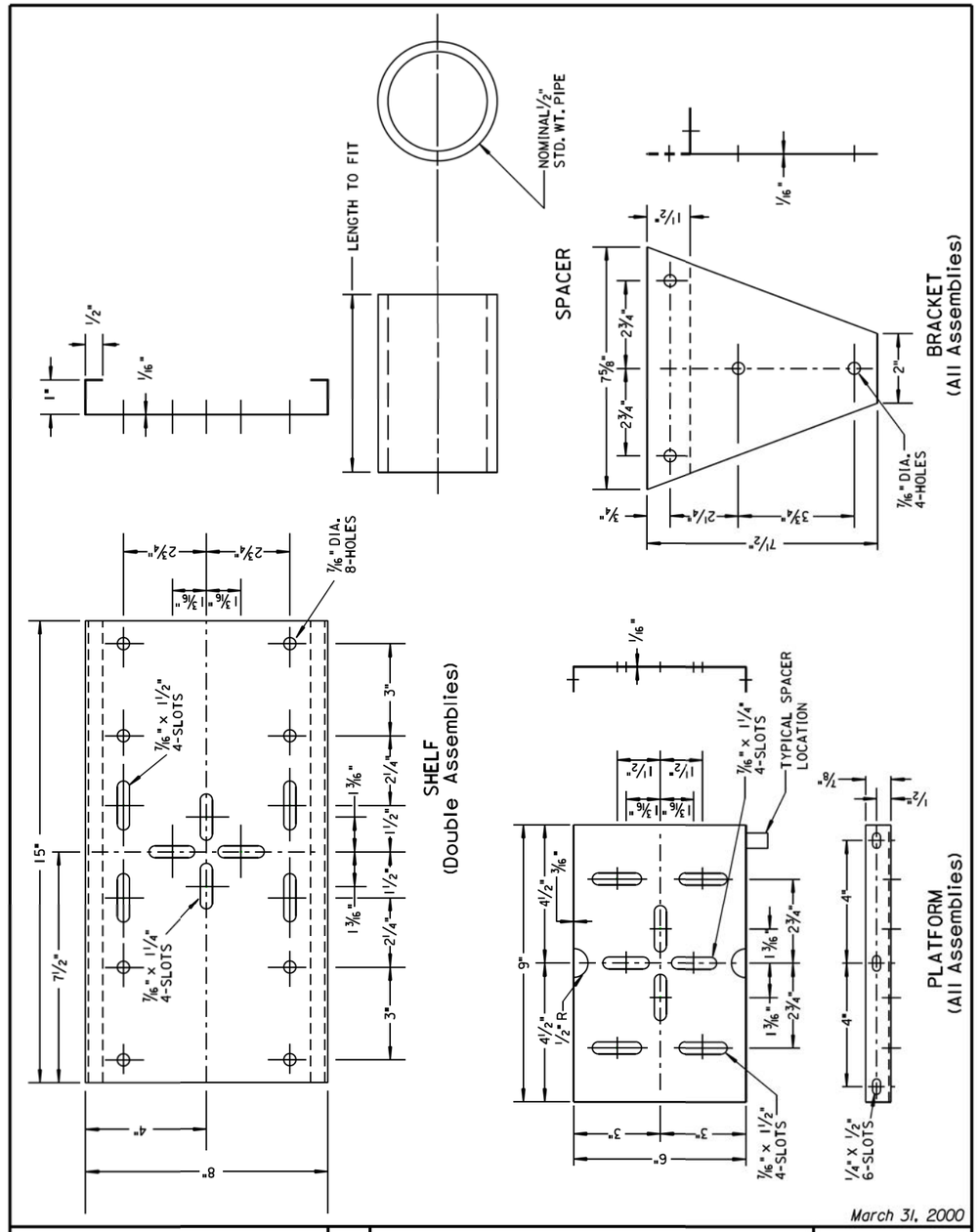
The post support assemblies provided should be consistant throughout the project. Single and double mailboxes may be in any sequence.

Post support assemblies shall be one from the approved products list, a 4"x4" or 4" round wood post, or an alternate post support assembly that meets the test level 3 crash testing requirements of NCHRP 350 or MASH.

Alternate mailbox support assemblies shall be approved by the Engineer prior to installation. The Contractor shall provide the Engineer written certification that the mailbox support assembly has met the crash testing requirements and will be installed in accordance with the manufacturer's installation instructions.

September 6, 2013

Published Date: 3rd Qtr. 2016	SDDOT	***SINGLE AND DOUBLE MAILBOX ASSEMBLIES***	***PLATE NUMBER*** 900.02 Sheet 1 of 1



March 31, 2000

Published Date: 3rd Qtr. 2016	SDDOT	***MAILBOX SUPPORT HARDWARE***	***PLATE NUMBER*** 900.03 Sheet 1 of 1