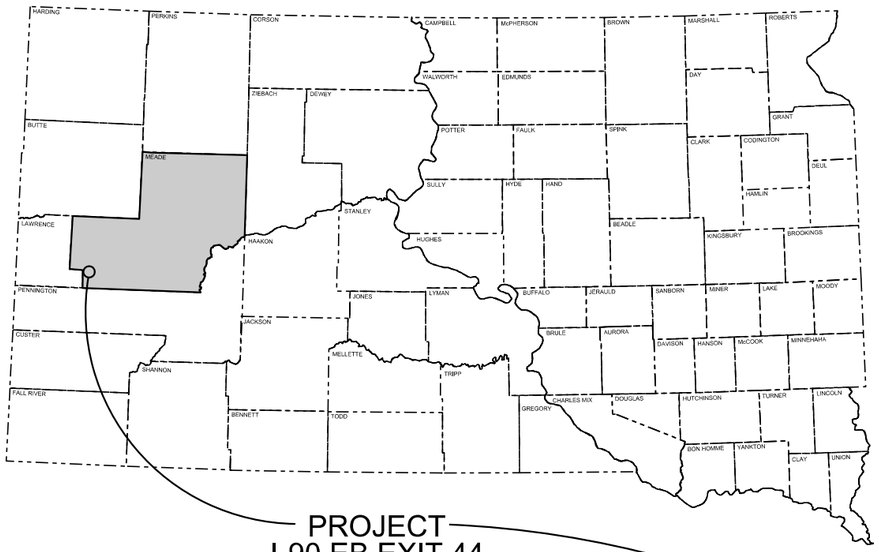


PROJECT
I-90 EB EXIT 44
MRM 44.66

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

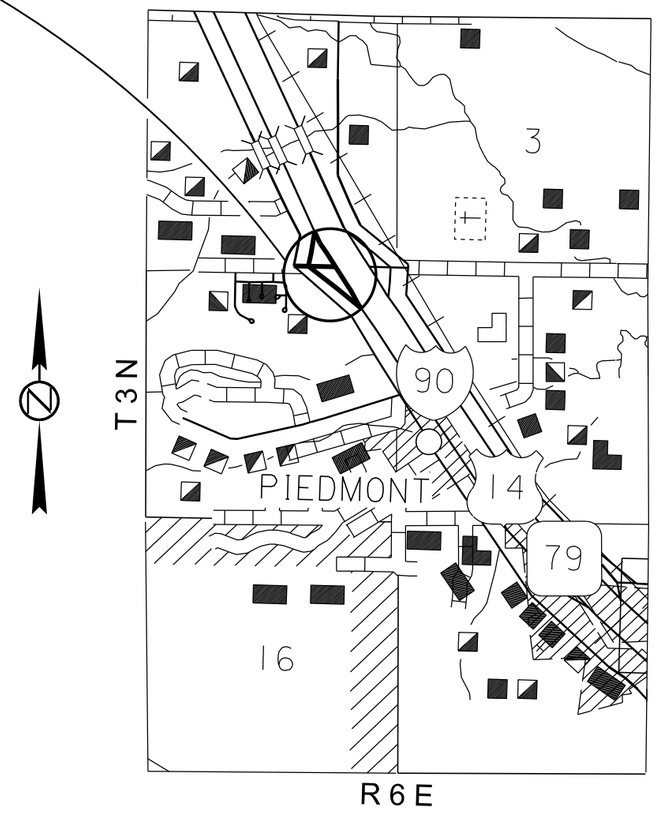
PROJECT IM 0901(183)44
INTERSTATE 90
MEADE COUNTY

BRIDGE DECK OVERLAY, APPROACH SURFACING, & GUARDRAIL
PCN 04NQ

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	1	44

Plotting Date: 07/23/2013

INDEX OF SHEETS



DESIGN DESIGNATION

ADT (2012)	8835
ADT (2032)	11318
DHV	1573
D	50%
T DHV	6.6%
T ADT	14.4%
V	75 mph

STORM WATER PERMIT

No Storm Water Permit Required

Plot Scale - 1:200
Plotted From - trrc12608
File - ...\prj\Mead04NQ\Design\Title.dgn

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0010	Mobilization	Lump Sum	LS
110E0070	Remove Rubberized Asphalt Chip Seal	531.8	SqYd
110E1180	Remove Spalled Concrete	239	SqFt
110E6000	Remove 3 Cable Guardrail for Reset	707	Ft
110E6010	Remove 3 Cable Guardrail Anchor Assembly for Reset	1	Each
110E6220	Remove Double W Beam Guardrail for Reset	25.0	Ft
110E6230	Remove W Beam Guardrail for Reset	75.0	Ft
110E6300	Remove Rubrail for Reset	25.0	Ft
120E0600	Contractor Furnished Borrow	137	CuYd
230E0100	Remove and Replace Topsoil	Lump Sum	LS
320E1200	Asphalt Concrete Composite	26.6	Ton
460E0300	Breakout Structural Concrete	0.7	CuYd
460E4000	Nonmetallic Fiber Reinforced Concrete Overlay	38.1	CuYd
491E0110	Abrasive Blasting of Bridge Deck	531.8	SqYd
491E0120	Bridge Deck Grinding	531.8	SqYd
550E0500	Finishing and Curing	531.8	SqYd
629E0100	3 Cable Guardrail	90	Ft
629E0200	Reset 3 Cable Guardrail	707	Ft
629E0400	3 Cable Guardrail Anchor Assembly	2	Each
629E0410	Reset 3 Cable Guardrail Anchor Assembly	1	Each
630E0250	Straight Double Class A Thrie Beam Rail	25.0	Ft
630E1200	Straight Class A W Beam Rail	125.0	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	2	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	2	Each
630E2110	Beam Guardrail Post and Block	16	Each
630E5140	Reset W Beam Guardrail with Wood Posts	37.5	Ft
630E5150	Reset Double W Beam Guardrail with Wood Posts	12.5	Ft
630E5160	Reset W Beam Rail	37.5	Ft
630E5170	Reset Double W Beam Rail	12.5	Ft
630E5220	Reset Rubrail	25.0	Ft
632E2220	Guardrail Delineator	29	Each
633E0010	Cold Applied Plastic Pavement Marking, 4"	720	Ft
633E5000	Grooving for Cold Applied Plastic Pavement Marking, 4"	720	Ft
634E0100	Traffic Control	2,568	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0310	Temporary Road Markers	300	Ft
634E0420	Type C Advance Warning Arrow Panel	1	Each
634E0700	Traffic Control Movable Concrete Barrier	2	Each
634E1215	Contractor Furnished Portable Changeable Message Sign	2	Each
734E0010	Erosion Control	Lump Sum	LS

SPECIFICATIONS

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

SEQUENCE

1. A speed resolution will be needed prior to traffic control.
2. Set up traffic control and close EB I-90 passing lane using standard plate 634.63. FLAGGER sign will not be used as per standard plate 634.63, and the speed limit 45 signs and FINES DOUBLED sign will remain up on fixed locations supports at all times.
3. Set up detour signing and close Exit 44 crossroad.
4. Route EB I-90 traffic onto EB I-90 on and off ramps.
5. Complete bridge rehab, guardrail modification, surfacing, and pavement markings.
6. Remove traffic control and restore traffic to all normal driving lanes.

UTILITIES

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.

Utilities within the limits of the proposed construction shall be adjusted by the owner as addressed in SDCL 31-26-23 unless otherwise indicated in these plans.

COMMITMENT C: WATER SOURCE

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

Action Taken/Required:

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

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

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

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

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

COMMITMENT R: FIRE PREVENTION IN THE BLACK HILLS AREA

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

Action Taken/Required:

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

REMOVE AND REPLACE TOPSOIL

Prior to beginning operations, a 4” depth of topsoil shall be bladed down the respective inslopes where widening for guardrail installations is to occur and left in a windrow at the edge of the work limits. Following completion of operations, topsoil shall be bladed back up the inslope to cover the disturbed areas..

ADDITIONAL EMBANKMENT

Additional embankment is necessary to accommodate the breakaway cable terminal installations.

Contractor Furnished Borrow shall be used to provide the additional embankment.

CONTRACTOR FURNISHED BORROW

The Contractor shall provide a suitable site for Contractor furnished borrow material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site.

The borrow material shall be approved by the Engineer. The plans quantity for Contractor Furnished Borrow as shown in the Estimate of Quantities will be the basis of payment for this item.

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

It is estimated that 137 Cubic Yards of Contractor Furnished Borrow will be required.

ASPHALT CONCRETE COMPOSITE

Mineral aggregate for the Asphalt Concrete Composite shall conform to the requirements of the Standard Specifications for Class E specifications.

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

The asphalt binder used in the mixture shall be PG 64-22, PG 64-28 or PG 64-34 Asphalt Binder.

Asphalt Concrete Composite shall be used to transition the existing surfacing to match the new elevation of the bridge deck overlay. The bevel on the surfacing edge shall be 3' wide outside the lanes, onto the shoulder.

TABLE OF ASPHALT CONCRETE COMPOSITE SURFACING

Table of Asphalt Concrete Composite Surfacing

Location		L	W	Maximum D	Asphalt Concrete Composite
Str. No. 47-088-551		Ft	Ft	Inches	Tons
Mainline	On-End	80.0	30.0	2	13.3
Mainline	Off-End	80.0	30.0	2	13.3
				Total	26.6

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 are at least two 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

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

Separate measurement and payment will not be made. All costs associated with furnishing and constructing the safety edge shall be incidental to the contract unit price per ton for Asphalt Concrete Composite.

TEMPORARY BRIDGE END PROTECTION

The Contractor shall place and maintain Type F movable concrete barriers. Type F movable concrete barriers shall be placed at the locations listed in the Guardrail Tables and as shown in the Guardrail Layout Sheets.

Type F movable concrete barriers placed end to end and adjacent to the bridge end shall be secured together and to the bridge to prevent separation of individual barrier sections should impact occur.

The South Dakota Department of Transportation shall furnish the movable concrete barriers for this project. The Contractor shall pick up the concrete barriers from Exit 52 and install the barriers as shown in the plans.

The Contractor shall contact Mr. Bob Smith (605-394-1646) at the Rapid City Area Office to arrange for pick up of the barriers.

The bottoms of the connecting pins shall be secured with the retaining plate, bolt and nut as shown on shown on Plate Number 628.01 Sheet 1 of 2.

All costs to place the Type F movable concrete barrier shall be paid for at the contract unit price per each for Traffic Control Movable Concrete Barrier.

Each Type F movable concrete barrier section adjacent to the bridge shall be connected to the bridge in accordance with attachment of movable concrete barriers to bridge end detail provided in these plans. All costs associated with this work shall be incidental to contract unit price per each for Traffic Control Movable Concrete Barrier.

TABLE OF GUARDRAIL

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	5	44

Table of Guardrail

Bid Item No.	110E6000	110E6010	110E6220	110E6230	110E6300	629E0200	629E0100	629E0400	629E0410	630E0250	630E1200	630E2000	630E2030	630E2110	630E5140	630E5150	630E5160	630E5170	630E5220	632E2220
Structure No. 47-088-551	Remove 3 Cable Guardrail for Reset	Remove 3 cable Guardrail Anchor Assembly for Reset	Remove Double W-Beam Guardrail for Reset	Remove W-Beam Guardrail for Reset	Remove Rubrail for Reset	Reset 3 Cable Guardrail	3 Cable Guardrail	3 Cable Gurdrail Anchor Assembly	Reset 3 cable Guardrail Anchor Assembly	Straight Double Class A Thrie-Beam Rail	Straight Class A W-Beam Rail	W-Beam to Thrie-Beam Guardrail Transition	W-Beam Guardrail Breakaway Cable Terminal	Beam Guardrail Post and Block	Reset W-Beam Guardrail with Wood Posts	Reset Double W-Beam Guardrail with Wood Posts	Reset W-Beam Rail	Reset Double W-Beam Rail	Reset Rubrail	Guardrail Delineator
Off-End	Ft	Each	Ft	Ft	Ft	Ft	Ft	Each	Each	Ft	Ft	Each	Each	Each	Ft	Ft	Ft	Ft	Ft	Each
Left	280	1				280	90	1	1	12.5	62.5	1	1							6
Right	427					427		1		12.5	62.5	1	1							9
On-End																				
Left			12.5	37.5	12.5									16			37.5	12.5	12.5	5
Right			12.5	37.5	12.5										37.5	12.5			12.5	9
Total	707	1	25	75	25	707	90	2	1	25	125	2	2	16	37.5	12.5	37.5	12.5	25	29

PERMANENT PAVEMENT MARKINGS

Pavement marking material for skip lines and lane lines shall be Cold Applied Plastic Pavement Marking, 3M 380ES or equivalent Type A as defined in Section 983 of the Standard Specifications.

This project will require 320 feet of yellow shoulder line marking, 320 feet of white shoulder line marking and eight 10-foot white skip lines (80 ft total).

The Contractor is responsible for properly locating the new striping in the original locations.

GROOVE FOR PAVEMENT MARKING

All concrete pavement surfaces which require cold applied plastic tape shall be grooved prior to application.

The grooving, light grinding or sand blasting operation shall remove the existing pavement markings and provide the surface preparation required for application of the cold applied plastic tape.

The work shall generally consist of grooving the concrete surface and subsequent application of cold applied plastic tape.

The groove shall be made in a single pass dry cut using stacked diamond or carbide tipped cutting heads mounted on a floating head with controls capable of providing uniform depth and alignment. The equipment shall be self-vacuuming and leave the cut groove ready for pavement marking installation. Dry cut grooving without a vacuum shall only be allowed if markings run perpendicular to the roadway, such as "STOP BARS". The pavement marking shall be placed in the grooves the same day as the cut. Grooves shall be clean and dry prior to pavement marking application.

Cutting head: The spacing between each blade must be such that there is less than a 10 mil raise in the finished groove between the blades.

Groove width: Pavement marking width + 1/2 inch (+/- 1/8 inch)

Groove depth: 80 Mils (+ 5/-0 Mils) for cold applied plastic tape

Groove length: Full length of marking + 3 inch grooving transition each end

Groove position: Minimum of 2 inches from edge of longitudinal seam

Groove cleaning: Grooves must be cleaned by using high pressure compressed air (90 psi minimum). A leaf blower will not be an acceptable substitute for compressed air.

If the cold applied plastic tape (including primer if required) does not immediately follow dry pavement grooving, the following shall apply:

Within 24 hours prior to placing the cold applied plastic tape the groove shall be sandblasted and free of any residue and laitance. If the cold applied plastic tape is not placed within 24 hours of sandblasting, the groove shall be re-sandblasted.

The cold applied plastic tape shall be installed in accordance with the manufacturer's recommendations.

\TRAFFIC CONTROL – GENERAL NOTES

1. Requests to deviate from the sequence of operations shall be submitted in writing to the Engineer for review. Approval of an alternate sequence of operations will only be allowed when the proposed changes meet with the Department's intent for traffic control and sequencing of the work. An alternate sequence shall be submitted for review a minimum of one week prior to potential implementation.

2. Unless otherwise stated in these plans, no work will be allowed during hours of darkness. Hours of darkness are defined, as ½ hour after sunset until ½ hour before sunrise.

3. Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work. Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage 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.

4. Existing guide, route, informational logo, regulatory, and warning signs shall be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor**.** Non-applicable signing shall be covered or removed during periods of inactivity. Periods of inactivity shall be defined as no work taking place for a period of more than 36 hours. The cost of removing or covering non-applicable signs shall be incidental to the contract lump sum price for, Traffic Control, Miscellaneous.

5. Construction signing mounted on portable supports shall not be used for duration of more than 3 days, unless approved by the Engineer. Construction signing that remains in the same location for more than 3 days shall be mounted on fixed location, ground mounted, breakaway supports.

6. If inappropriate/conflicting pavement markings exist, the markings shall be removed and replaced with applicable temporary pavement markings when the work duration is more than 3 days. When the work duration is less than 3 days, the channelizing devices in the area where the pavement markings conflict shall be placed at a spacing of ½ G (for G see Standard Plate 634.63). Pavement marking removals shall be paid for at the contract unit price for Remove Pavement Marking, 4" or equivalent. Temporary pavement marking shall be paid for at the contract unit bid price for Temporary Pavement Marking. The additional channelizing devices shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

7. The quantity of Signs paid for will be for the greatest number of installations per sign in place at any one time regardless of the number of set-ups on the project.

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

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

TRAFFIC CONTROL – GENERAL NOTES (CONTINUED)

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

11. The Contractor shall be required to have a person available 24 hour/day, 7 days/week to maintain traffic control devices. The name and cellular telephone number of this individual shall be given to the Engineer at the preconstruction meeting.

12. The Contractor or designated traffic control subcontractor shall make night inspections at the initial set up of traffic control and every week thereafter to ensure the adequacy, legibility and reflectivity of each sign and device. A written summary of each inspection shall be given to the Engineer within 24 hours after completion of the inspection. The cost for the nighttime inspection work shall be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

13. Vehicles working in traffic or alongside traffic shall be equipped with a flashing amber light visible from all directions. The amber light shall be mounted on the uppermost part of the contractor's vehicle. Lights must have peak intensity within the range of 40 to 400 candelas and must flash at 75 ± 15 flashes per minute. Vehicle flasher/hazard lights are not acceptable.

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

15. 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.

16. Temporary Road Markers shall be used for lane closure tapers or lane shift tapers. Temporary Road Markers used for tapers and shifts will not be measured for payment and will be incidental to the contract lump sum price for Traffic Control, Miscellaneous.

17. Drums are required in all lane closure tapers

18. Covering of non-applicable signs may require different size and dimensions of covers. The cost for making, covering and removing covers shall be incidental to the contract lump sum price for, Traffic Control, Miscellaneous.

INVENTORY OF TRAFFIC CONTROL DEVICES

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-2	48" x 24"	END ROAD WORK	6	24	144
M1-1	36" x 36"	INTERSTATE ROUTE MARKER (2 digits)	1	27	27
M3-2	36" x 18"	DIRECTION MARKER - EAST	1	17	17
M4-8	30" x 15"	DETOUR	1	14	14
M6-1	30" x 21"	DIRECTION ARROW - HORIZONTAL SINGLE HEAD	1	16	16
R1-1	36" x 36"	STOP	1	27	27
R2-1	36" x 48"	SPEED LIMIT ##	2	29	58
R2-6aP	36" x 24"	FINES DOUBLE	2	20	40
R3-1	36" x 36"	NO RIGHT TURN (SYMBOL)	3	27	81
R3-2	36" x 36"	NO LEFT TURN (SYMBOL)	2	27	54
R11-2	48" x 30"	ROAD CLOSED	6	27	162
W1-2	48" x 48"	LEFT OR RIGHT CURVE ARROW	2	34	68
W1-6	60" x 30"	ONE DIRECTION LARGE ARROW	2	30	60
W3-1	48" x 48"	STOP AHEAD (SYMBOL)	1	34	34
W3-5	48" x 48"	REDUCED SPEED LIMIT AHEAD	2	34	68
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	68
W20-1	48" x 48"	ROAD WORK #### FT. OR AHEAD	7	34	238
W20-5	48" x 48"	LT. OR RT. LANE CLOSED #### FT. OR AHEAD	2	34	68
SPECIAL	48 x 54	DESCRIPTION	4	36	144
SPECIAL	60 x 60	DESCRIPTION	1	44	44
SPECIAL	48 x 24	DESCRIPTION	3	24	72
*****		TYPE III BARRICADE - 8 FT. DOUBLE SIDED	19	56	1064
				TOTAL UNITS	**2568**

TEMPORARY PAVEMENT MARKING

Temporary Pavement Marking shall be used on all temporary surfacing, surfacing which is to be removed, on cross road at bottom of EB ramps, or as directed by the Engineer.

Payment for temporary pavement marking will be by the foot per 4" line or equivalent. Payment will be for all costs to furnish, and install temporary pavement markings.

TYPE C ADVANCE WARNING ARROW PANEL

The quantity of Type C Advance Warning Arrow Panels paid will be the most installations in place at any one time regardless of the number of setups on the project.

EROSION CONTROL

Areas disturbed or damaged shall be seeded, fertilized and mulched.

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

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

Type F Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/1000 SqFt)
Western Wheatgrass	Flintlock, Rodan, Rosana	1.3
Green Needlegrass	Lodorm	0.8
Sideoats Grama	Butte, Killdeer, Pierre, Trailway	0.6
Blue Grama	Bad River, Willis	0.4
Oats or Spring Wheat: April through July; Winter Wheat: August through November		1.9
Total:		5.0

A commercial fertilizer with a minimum guaranteed analysis of 13-13-13, 18-46-0, 11-52-0, or an approved alternate fertilizer sold for use as a lawn starter fertilizer shall be applied to all areas designated for permanent seeding. The application rate of fertilizer shall be 3 pounds per 1000 SqFt.

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

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

EROSION CONTROL (CONTINUED)

Fiber mulch shall be applied at the rate of 2000 pounds per acre.

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

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

The fiber mulch used on this project shall be one from the list below:

Product	Manufacturer
Mat-Fiber Plus	Mat, Inc. Floodwood, MN Phone: 1-888-477-3028 www.matinc.biz
Conwed Hydro Mulch 2000	Profile Products LLC Buffalo Grove, IL Phone: 1-800-366-1180 www.conwedfibers.com
EcoFibre Plus Tackifier	Profile Products LLC Buffalo Grove, IL Phone: 1-800-366-1180 www.profile-eco.com
Terra Wood with Tacking Agent 3	Profile Products LLC Buffalo Grove, IL Phone: 1-800-726-6371 www.terra-mulch.com
Bindex Wood WT	American Excelsior Co. Arlington, TX Phone: 1-800-777-7645 www.curlex.com
Second Nature Wood Fiber Mulch Plus	Central Fiber LLC Canton, OH Phone: 1-888-452-2630 www.centralfiber.com

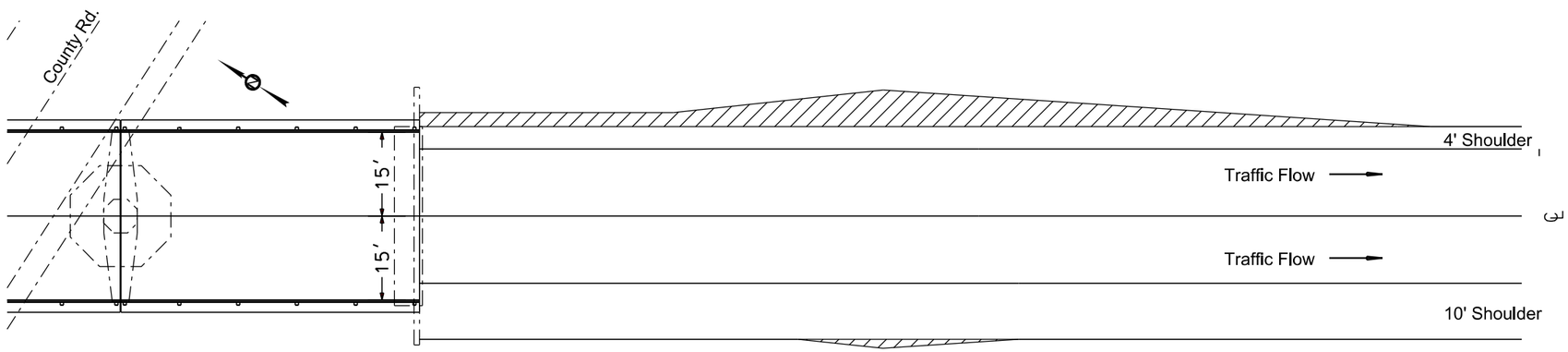
Approximately 1770 SqFt will require permanent seeding. The Engineer may adjust this quantity up or down depending on damage to the area surrounding the project.

All costs associated with permanent seeding, fertilizing, and fiber mulching shall be incidental to the contract lump sum for price for Erosion Control.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	8	44

Plotting Date: 07/17/2013

ADDITIONAL EMBANKMENT FOR GUARDRAIL



CONTRACTOR FURNISHED BORROW

PLOT SCALE - 1.125

PLOTTED FROM - TRRC12608

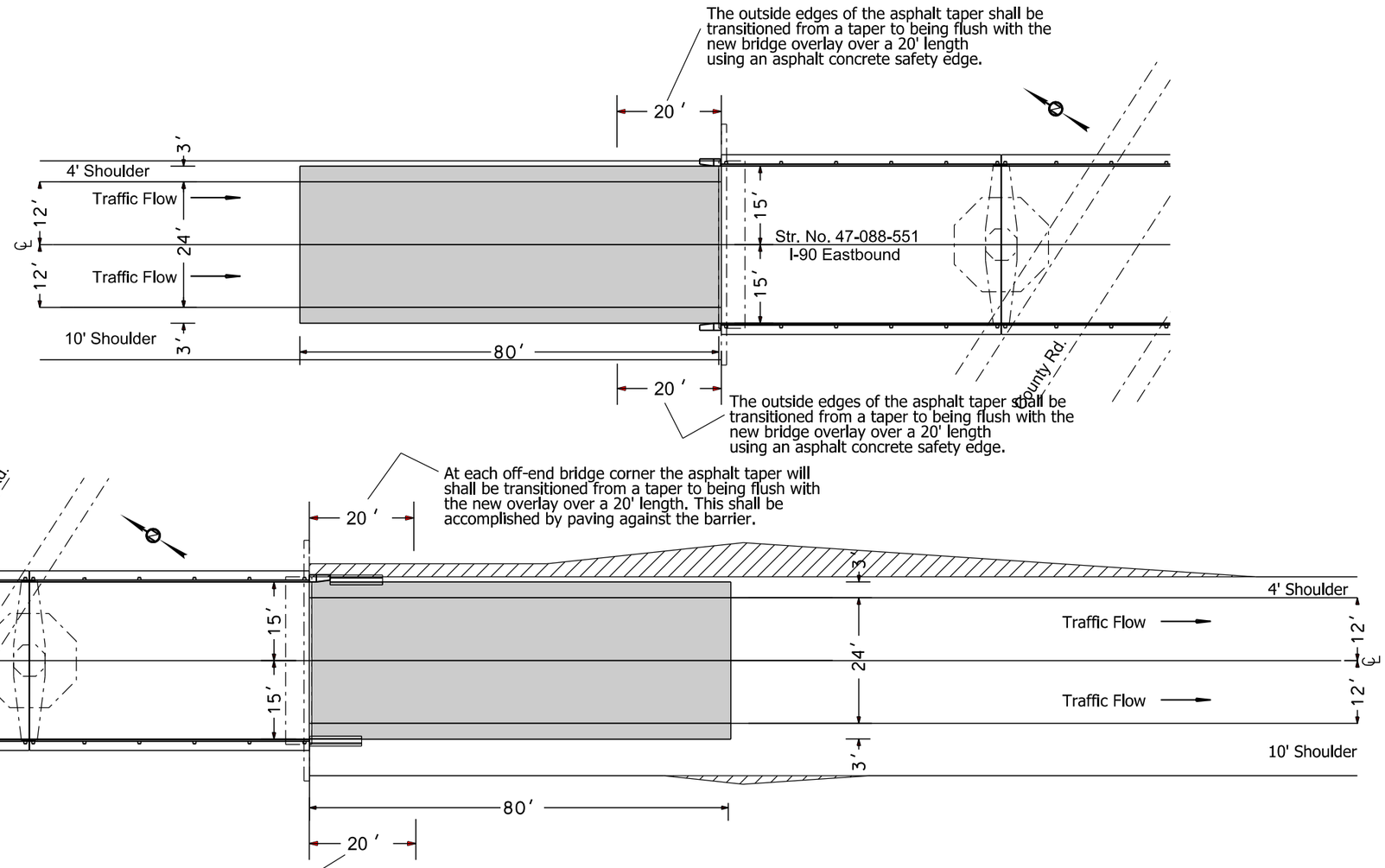
PLOT NAME - 2

FILE - ...\PRJ\MEAD04N0\DESIGN\TAPERS.DGN

ASPHALT SURFACING AREAS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	9	44

Plotting Date: 07/23/2013



ASPHALT CONCRETE COMPOSITE

CONTRACTOR FURNISHED BORROW

PLOT SCALE - 1.25

PLOTTED FROM - TRRC12608

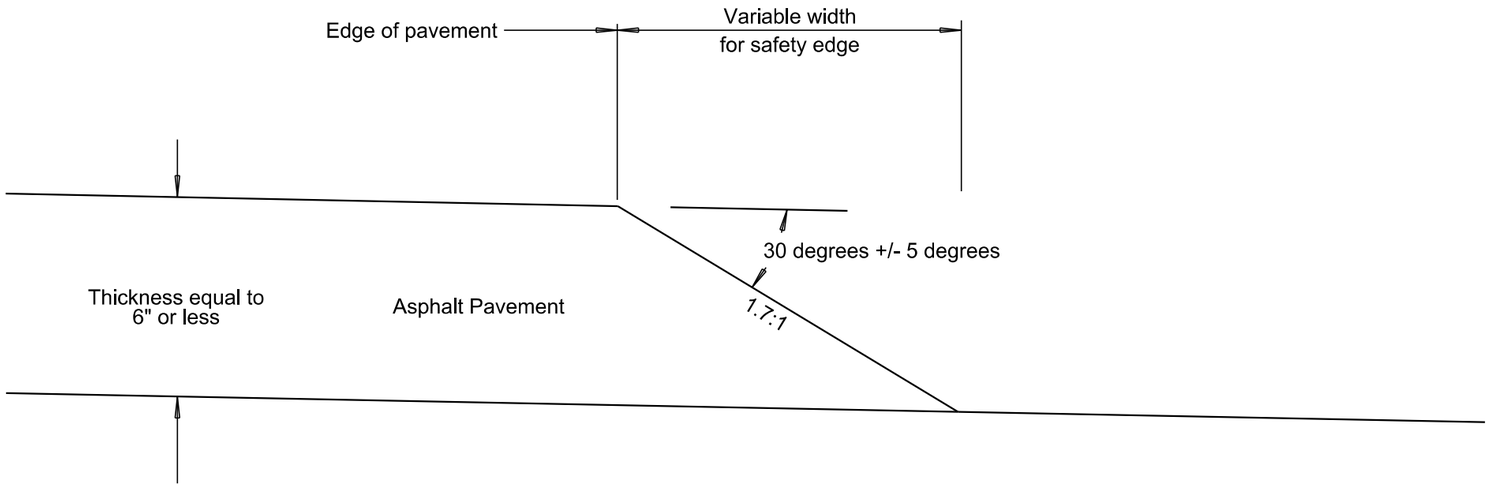
PLOT NAME - 3

FILE - ...\PRJVMEAD04ND\DESIGN\TAPERS.DGN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	10	44

Plotting Date: 07/23/2013

SAFETY EDGE CONFIGURATION FOR ASPHALT PAVEMENTS



Safety Edge Dimension for HMA Pavements (Thickness 6" or Less)

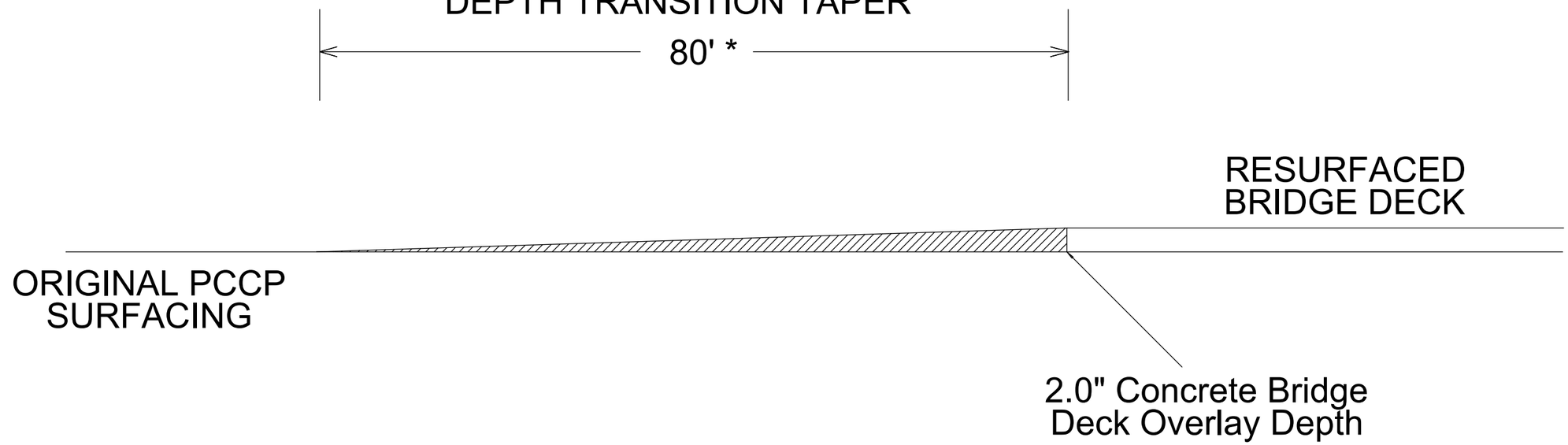
PLOT SCALE - 1:200

ASPHALT CONCRETE TAPER AT BRIDGE ENDS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	11	44

Plotting Date: 07/17/2013

* At the discretion of the Engineer.



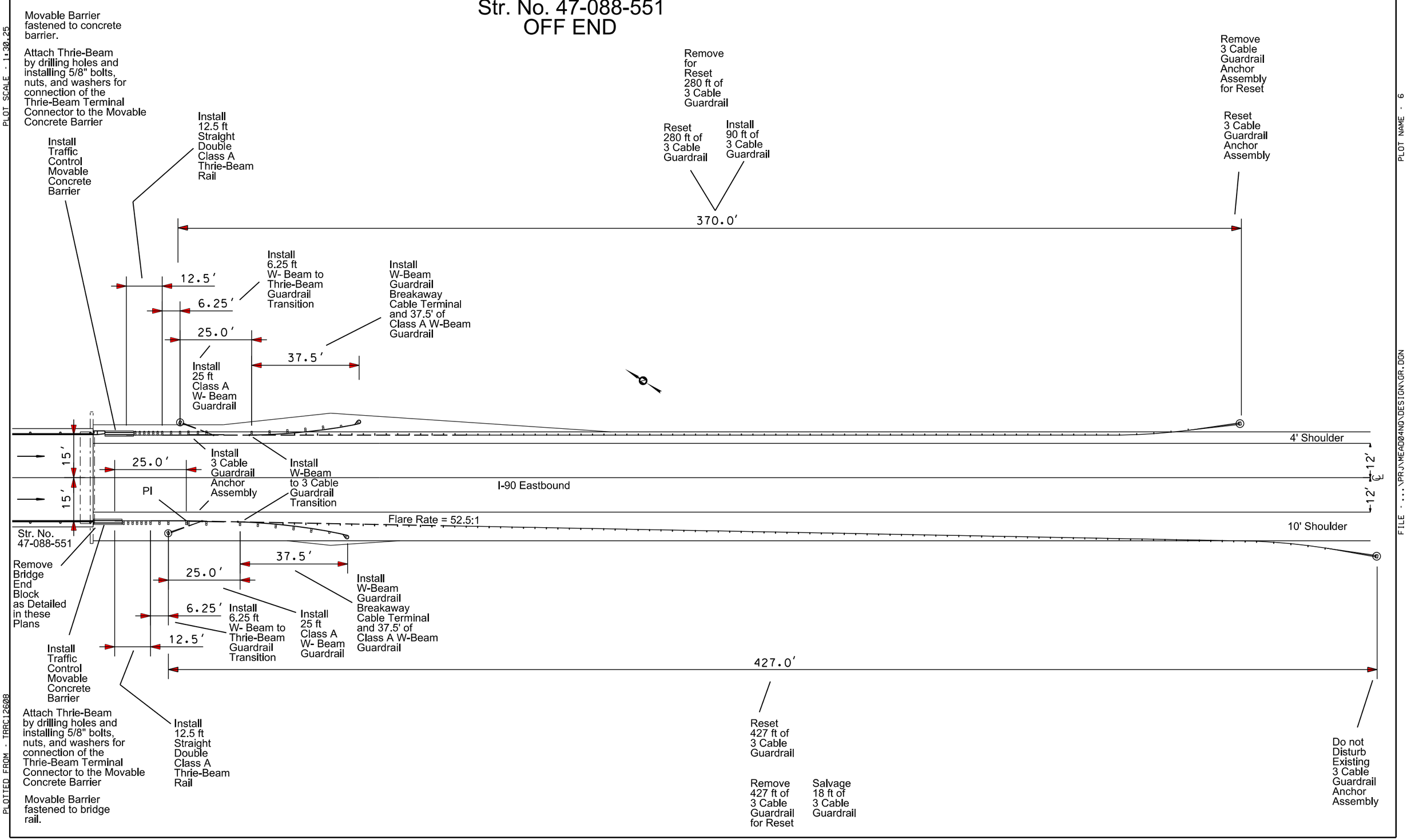
PLOTTED FROM - TRRC12608

PLOT NAME - 5

FILE - ...\MEAD04NO\DESIGN\COLDMILL.DGN

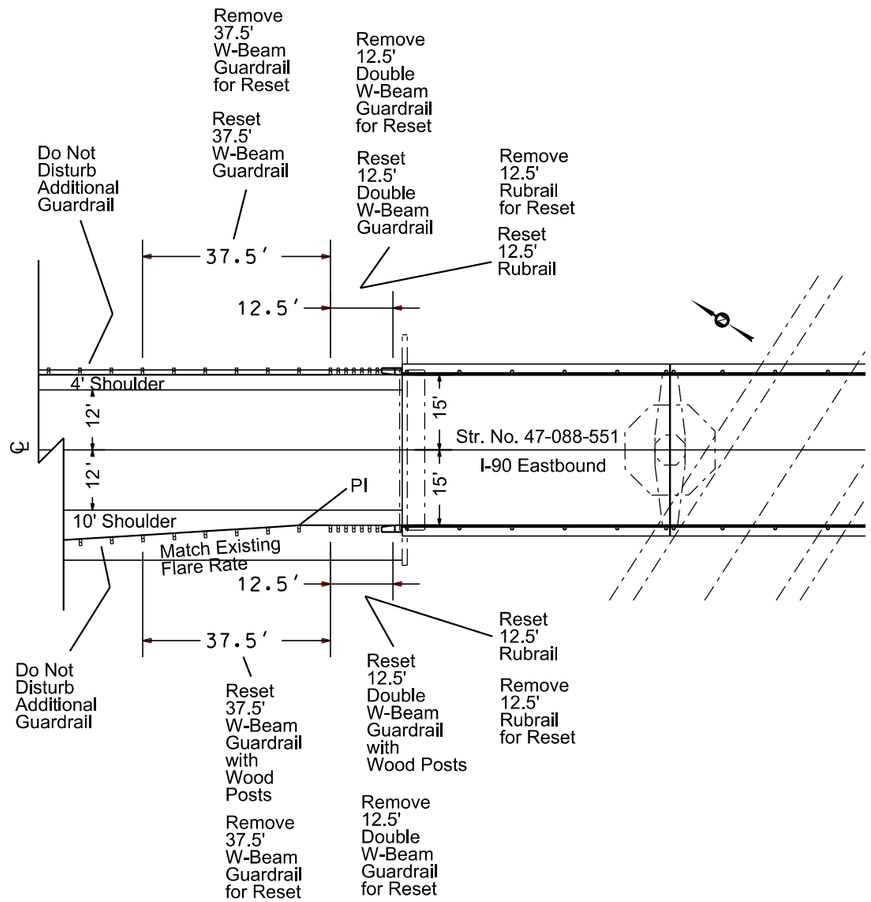
GUARDRAIL LAYOUT

Str. No. 47-088-551
OFF END



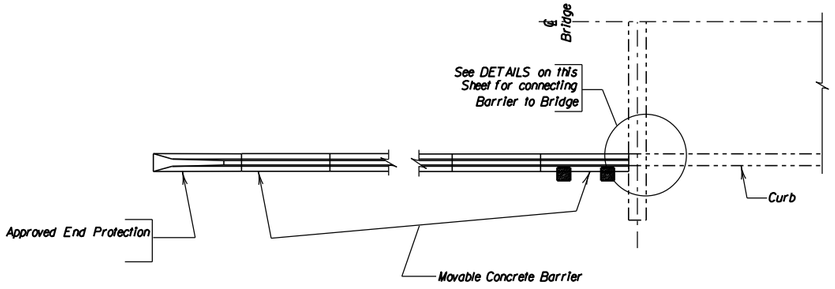
GUARDRAIL LAYOUT

Str. No. 47-088-551
ON END

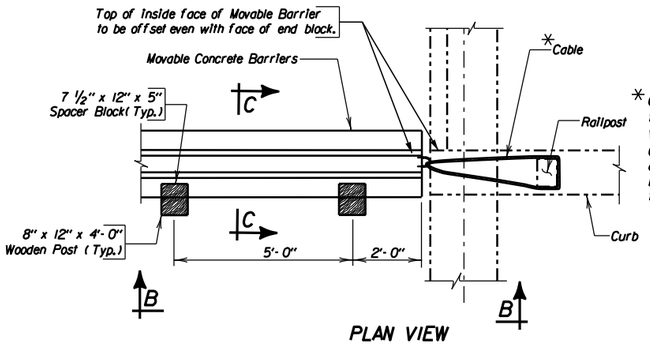


The Contractor will ensure the entire width of the Barriers are installed on a level surface.

ATTACHMENT OF MOVABLE CONCRETE BARRIERS TO BRIDGE ENDS

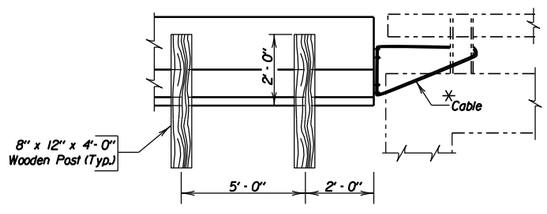


LAYOUT OF MOVABLE CONCRETE BARRIER AT BRIDGE ENDS

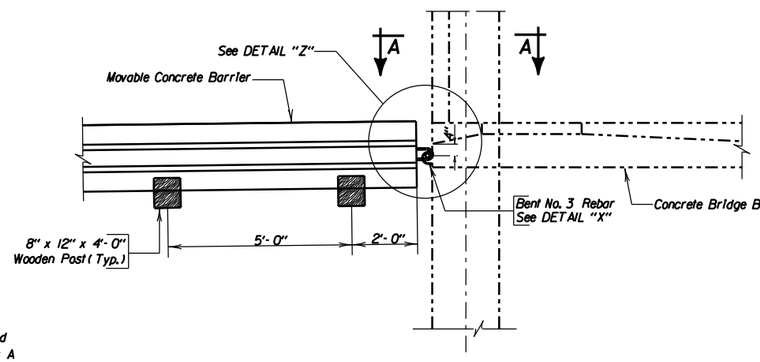


* Cable used to attach Movable Barrier to rail post shall be ¾ inch Zinc Coated Wire Rope for Guardrail, Type I, Class A Coating, conforming to AASHTO M30 or as approved by the Engineer. Cable shall be tightened and secured as approved by the Engineer.

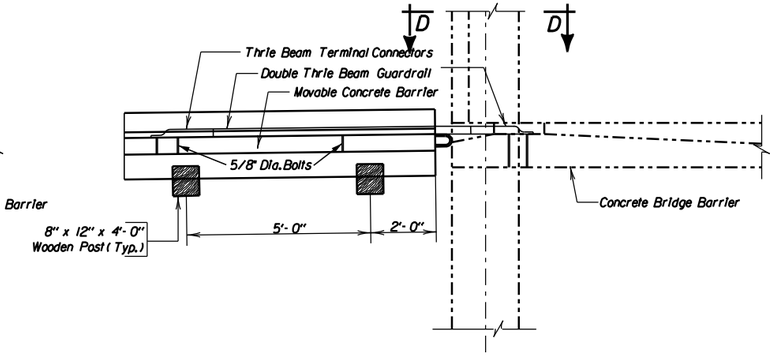
PLAN VIEW
MOVABLE BARRIER FASTENED TO BRIDGE RAIL POST



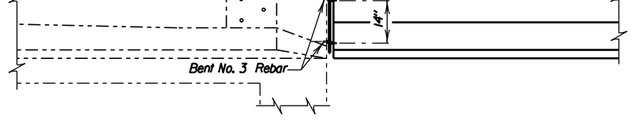
VIEW B - B



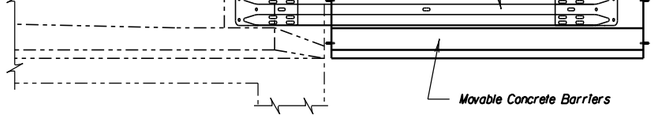
PLAN VIEW
MOVABLE BARRIER FASTENED TO CONCRETE BARRIER



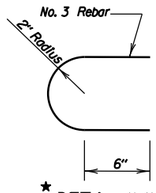
PLAN VIEW
MOVABLE BARRIER FASTENED TO CONCRETE BARRIER



VIEW A - A

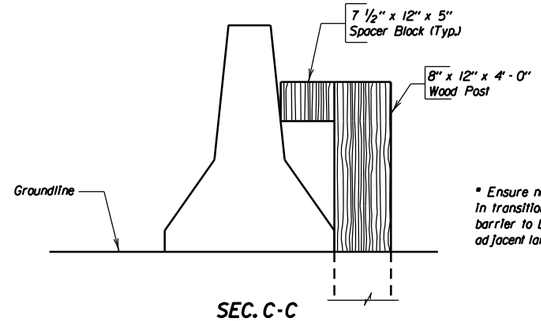


VIEW D - D



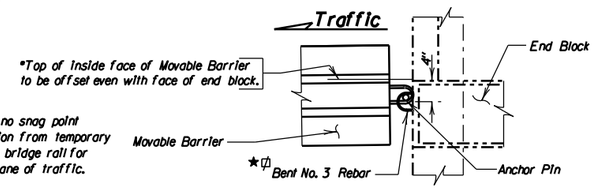
★ Drill in and epoxy No. 3 Rebar. See notes under "Installing Dowels In Concrete". Minimum Embedment of 4".

★ DETAIL "X"



SEC. C-C

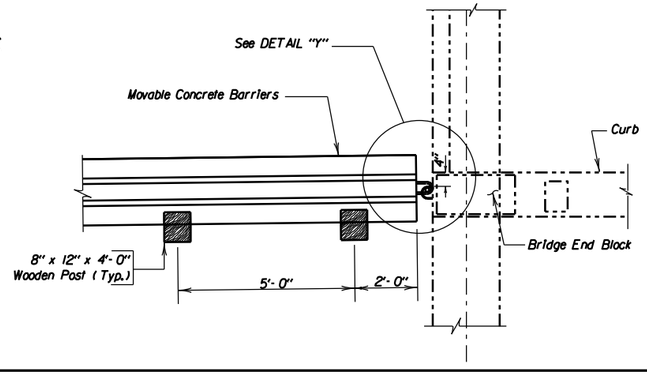
PLAN VIEW
MOVABLE BARRIER FASTENED TO BRIDGE END BLOCK

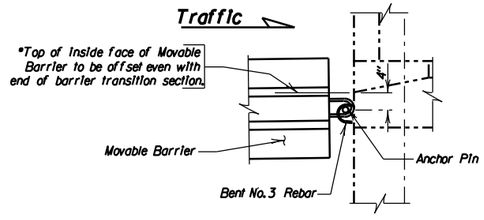


* Ensure no snag point in transition from temporary barrier to bridge rail for adjacent lane of traffic.

⌀ Use same spacing as shown in VIEW A - A.

DETAIL "Y"



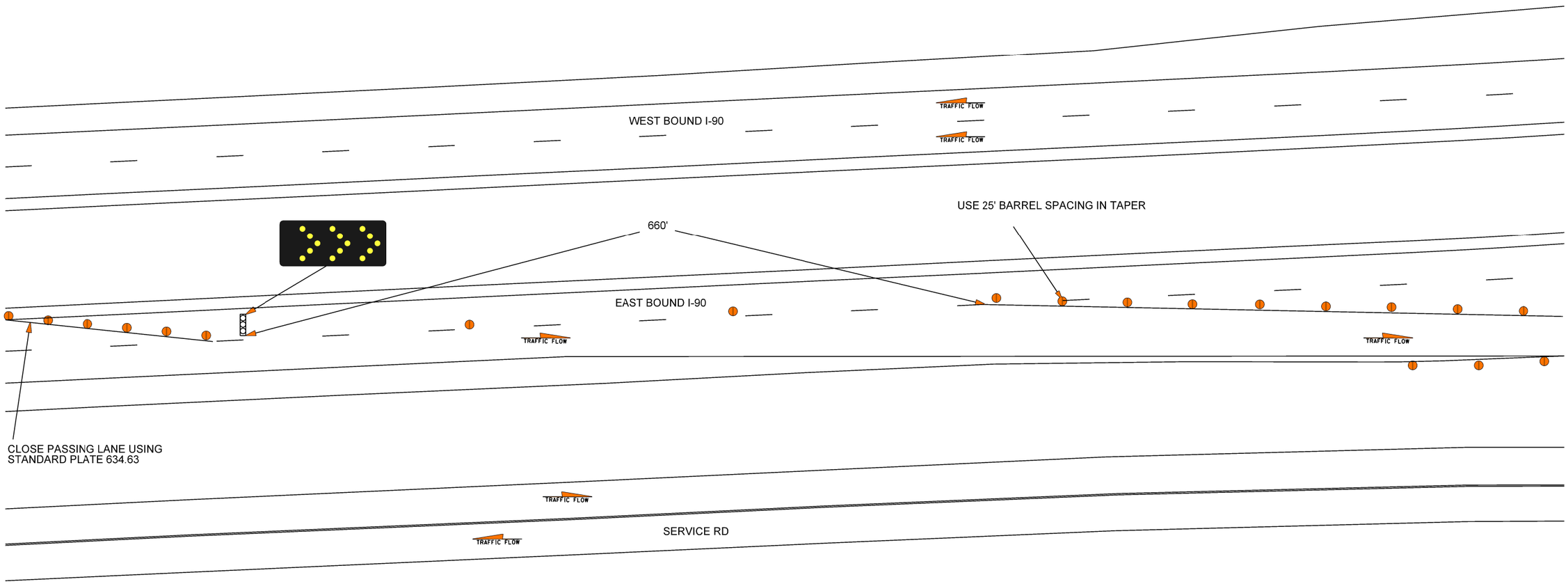


DETAIL "Z"

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	15	44

Plotting Date: 07/09/2013

TRAFFIC CONTROL
EXIT 44



- CHANNELIZING DEVICE (BARRELS OR GRABBERS)
- TUBULAR MARKER
- WORK AREA
- TRANSITIONS AND TAPERS SHALL UTILIZE TAB'S AND BARRELS
- SIGN SPACING, BARREL SPACING AND TAPER LENGTHS SHALL CONFORM TO STANDARD PLATES.
- INTERIM EDGELINES SHALL BE TEMPORARY PAVEMENT MARKING PAINT ON ALL TEMPORARY SURFACING, AND RAISED PAVEMENT MARKERS ON PERMANENT SURFACING.

Plot Scale - 1:40

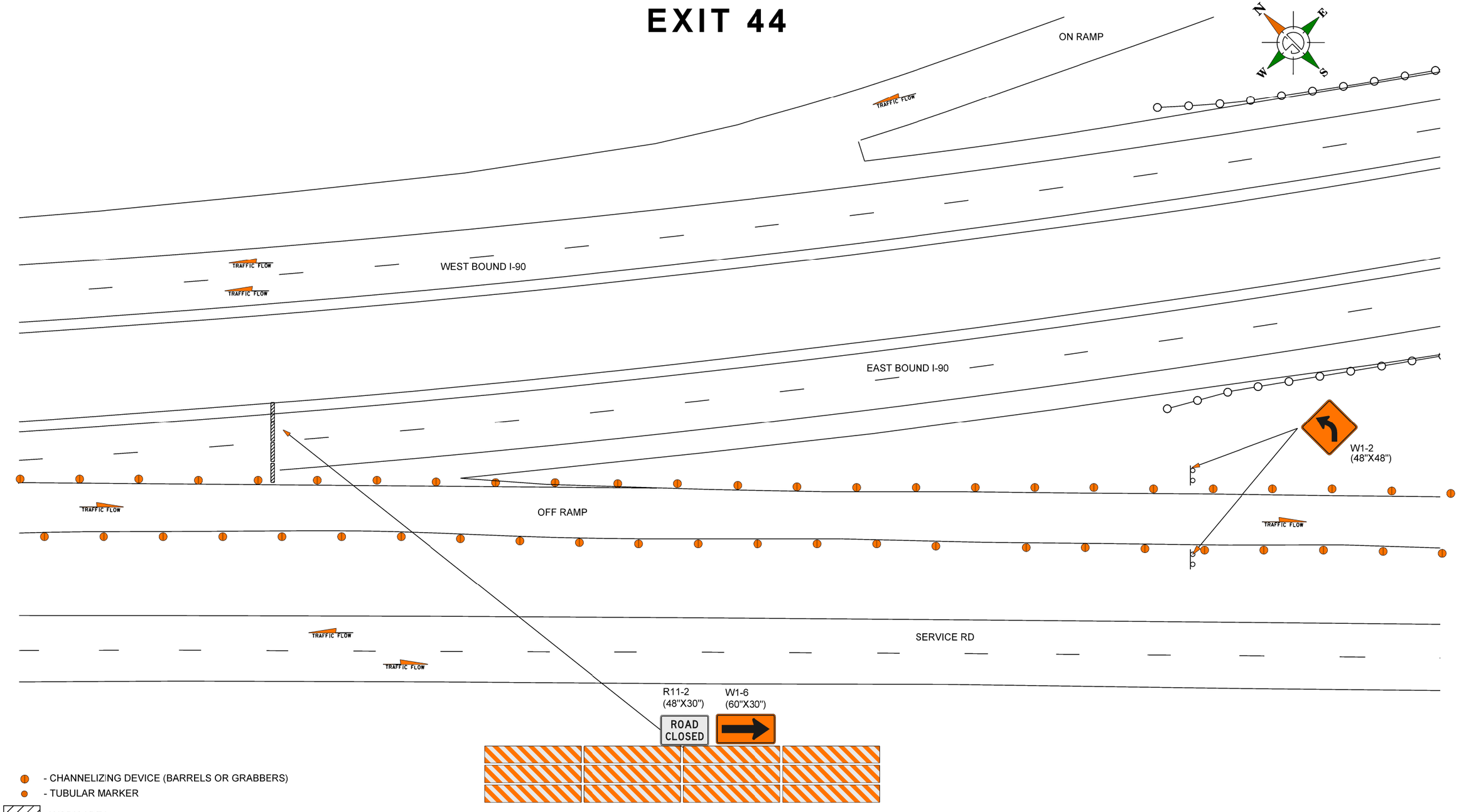
Plotted From - trrc11644

File - ...\Exit 44 Ramp Diversion.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	16	44

Plotting Date: 07/09/2013

TRAFFIC CONTROL
EXIT 44



- CHANNELIZING DEVICE (BARRELS OR GRABBERS)
- TUBULAR MARKER
- WORK AREA
- TRANSITIONS AND TAPERS SHALL UTILIZE TAB'S AND BARRELS
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Plot Scale - 1:40

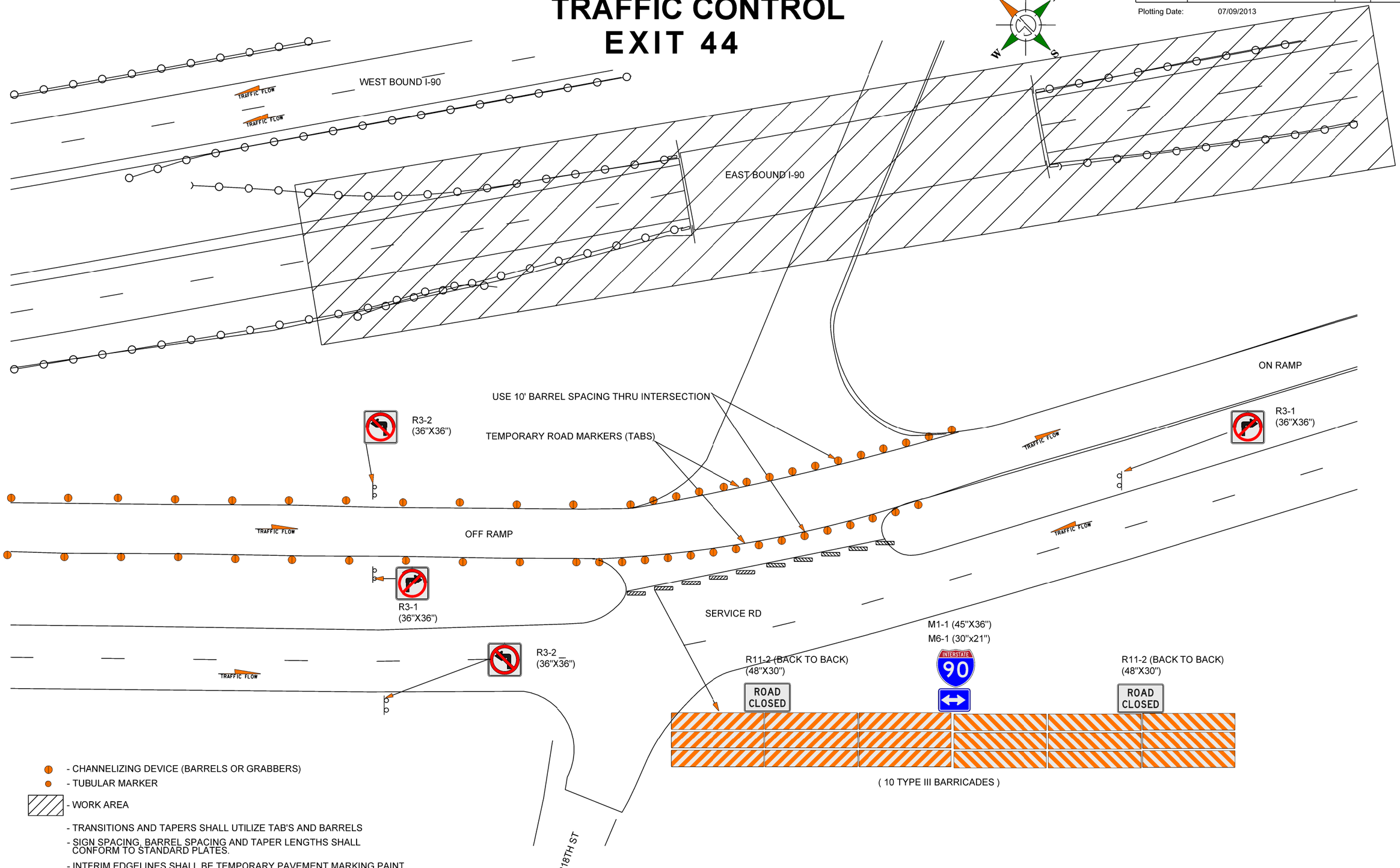
Plotted From - trrc11644

File - ...\Exit 44 Ramp Diversion.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	17	44

Plotting Date: 07/09/2013

TRAFFIC CONTROL
EXIT 44



- CHANNELIZING DEVICE (BARRELS OR GRABBERS)
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Plot Scale - 1:40

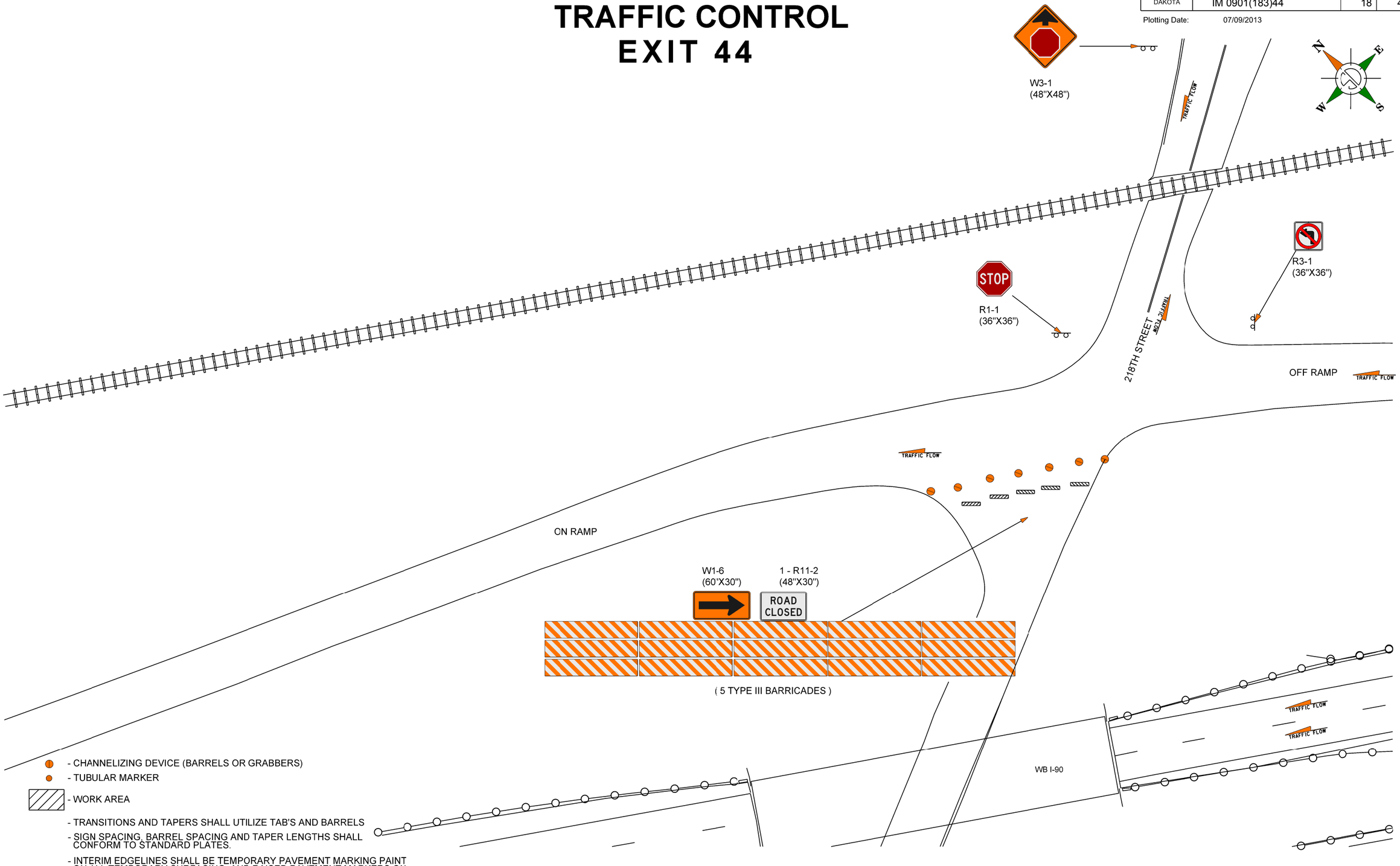
Plotted From - trrc11644

File - ...\Exit 44 Ramp Diversion.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	18	44

Plotting Date: 07/09/2013

TRAFFIC CONTROL
EXIT 44



- CHANNELIZING DEVICE (BARRELS OR GRABBERS)
- TUBULAR MARKER
- WORK AREA
- TRANSITIONS AND TAPERS SHALL UTILIZE TAB'S AND BARRELS
- SIGN SPACING, BARREL SPACING AND TAPER LENGTHS SHALL CONFORM TO STANDARD PLATES.
- INTERIM EDGELINES SHALL BE TEMPORARY PAVEMENT MARKING PAINT ON ALL TEMPORARY SURFACING, AND RAISED PAVEMENT MARKERS ON PERMANENT SURFACING.

Plot Scale - 1:40

Plotted From - trrc11644

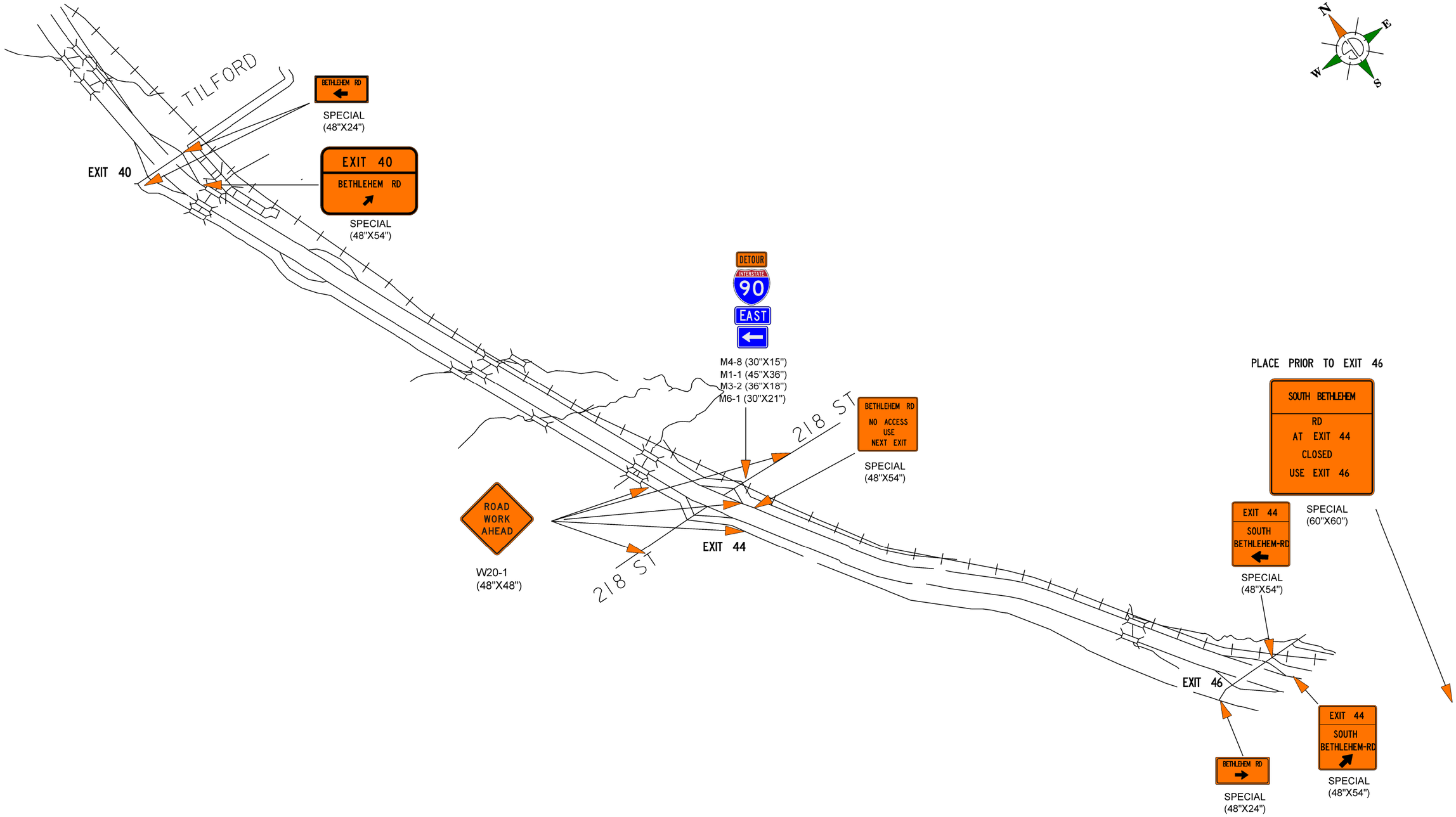
File - ...\Exit 44 Ramp Diversion.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0901(183)44	19	44

Plotting Date: 07/09/2013

TRAFFIC CONTROL

FIXED SIGNING AND DETOUR SIGNING

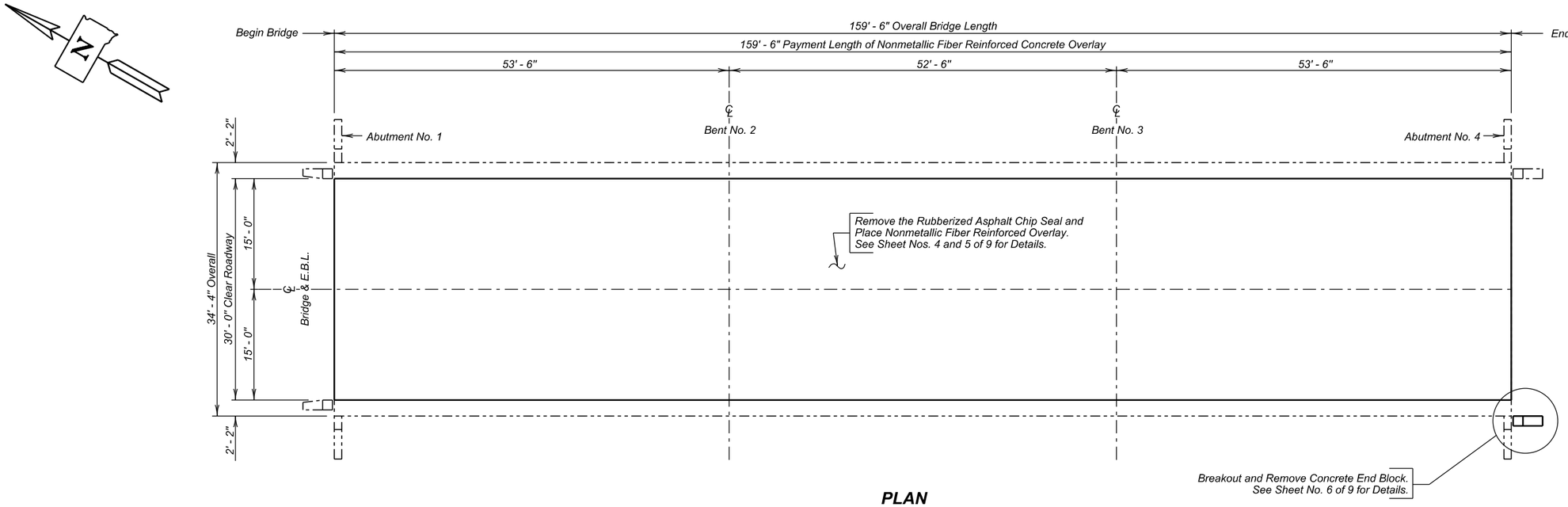


Plot Scale - 1:40

Plotted From - trrc11644

File - ...\Exit 44 Ramp Diversion.dgn

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(183)44	20	44



PLAN

INDEX OF BRIDGE SHEETS

LAYOUT FOR UPGRADING

FOR

159' - 6" COMPOSITE I BEAM BRIDGE

30' - 0" ROADWAY — 0° SKEW
OVER COUNTY ROAD — SEC. 4/9-T3N-R6E
STR. NO. 47-088-551 — IM 0901(183)44
PCN 04NQ

MEADE COUNTY

S. D. DEPT. OF TRANSPORTATION

MAY 2013

1 OF 9

PLANS BY :
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

DESIGNED BY	CK. DES. BY	DRAFTED BY	
NP	TK	JRK	Kevin N. Boeder
MEAD04NQ	04NQLA01		BRIDGE ENGINEER

ESTIMATE OF STRUCTURE QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
110E0070	Remove Rubberized Asphalt Chip Seal	531.8	SqYd
110E1180	Remove Spalled Concrete	239	SqFt
460E0300	Breakout Structural Concrete	0.7	CuYd
460E4000	Nonmetallic Fiber Reinforced Concrete Overlay	38.1	CuYd
491E0110	Abrasive Blasting of Bridge Deck	531.8	SqYd
491E0120	Bridge Deck Grinding	531.8	SqYd
550E0500	Finishing and Curing	531.8	SqYd

SPECIFICATIONS

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and/or Special Provisions as included in the Proposal.

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans and are provided as information only. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.

SCOPE OF BRIDGE WORK & SEQUENCE OF OPERATIONS

All work on this structure shall be accomplished with the traffic control shown in the plans.

1. Remove Rubberized Asphalt Chip Seal.
2. Perform bridge deck grinding and remove all loose and spalled concrete from the bridge deck surface.
3. Prepare bridge deck surface in accordance with the notes for the Nonmetallic Fiber Reinforced Concrete Overlay.
4. Place a Nonmetallic Fiber Reinforced Concrete Overlay
5. Breakout and remove concrete end block as detailed in the plans.

CONCRETE BREAKOUT

1. The existing end block shall be broken out to the limits shown on the plans.
2. All broken out concrete and discarded reinforcing bars shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Construction Specifications.
3. The contract unit price per cubic yard for "Breakout Structural Concrete" shall include breaking out concrete, reinforcing steel, and disposal of all broken out material.

REMOVAL OF EXISTING RUBBERIZED ASPHALT CHIP SEAL

1. There is rubberized asphalt chip seal on the bridge deck. The intent of this construction is to remove the rubberized asphalt chip seal (RACS) to allow for the placement of the Nonmetallic Fiber Reinforced Concrete Overlay
2. Removal of existing RACS shall consist of heating the RACS to a specified temperature and removing the heated RACS from the bridge deck surface by scraping with a front end loader and hand tools as outlined in the following notes.
3. Heating requirements:
   a. The existing RACS shall be heated to a temperature range of 125° F to 140° F (52° C to 60° C) as measured using an infrared pyrometer. The infrared pyrometer shall be furnished by the Department. Removal of the RACS shall not proceed until the temperature of the RACS is within the specified temperature range.
   b. Heating the existing RACS shall be accomplished with mobile heaters capable of heating the RACS to the specified temperature range. The heating equipment shall be placed directly in front and for the full width of the RACS removal equipment. Portable propane heaters are acceptable.
   c. A visual indication that the existing RACS is nearing the specified temperature will be the appearance of small glossy black spots on the RACS surface.
4. Mechanical Removal Requirements:

a. The RACS removal shall be accomplished with the blade of a front end loader or hand tools in areas that are inaccessible by a front end loader blade.

   b. The tools used to remove the RACS shall be sharp such that they will cut into the RACS and penetrate down to the concrete surface. The tools shall be well lubricated with a non-flammable commercially available product that will prevent the RACS material from sticking to the blade.

REMOVAL OF EXISTING RUBBERIZED ASPHALT CHIP SEAL (CONTINUED)

   c. When using a blade on a front end loader, maintain a 60 to 70 degree angle between the tool blade and the concrete deck surface and maintain as much downward force on the blade as is possible without damaging the concrete deck surface as approved by the Engineer.
   d. The intent is to remove all of the aggregate and as much of the asphalt material as possible prior to surface grinding of the area.
   e. All removed RACS material shall become the property of the Contractor for disposal.
5. Remove Rubberized Asphalt Chip Seal will be measured to the nearest 0.1 foot and the area computed to the nearest 0.1 square yard. Remove Rubberized Asphalt Chip Seal will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to remove and dispose of the rubberized asphalt chip seal.

BRIDGE DECK GRINDING

1. Grinding shall be accomplished using diamond blades mounted on a self-propelled machine designed for grinding and texturing pavement. The equipment shall be operated in such a manner that no damage to the underlying deck surface occurs. Grinding equipment that causes ravels, aggregate fractures, or spalls shall not be permitted. Residue or excess water generated by the grinding operations shall be removed with vacuum equipment from the deck surface before the residue has time to set up. Vacuumed residue or excess water shall not be expelled adjacent to the bridge.
2. Bridge Deck Grinding will be measured to the nearest 0.1 foot and the area computed to the nearest 0.1 square yard. Bridge Deck Grinding will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to grind the bridge deck surface to the required profile and to remove and dispose of the grinding residue and water.

ESTIMATE OF STRUCTURE QUANTIES AND NOTES FOR

159' – 6" COMPOSITE I BEAM BRIDGE

Str. No. 47-088-551

MAY 2013

DESIGNED BY:	DRAWN BY:	CHECKED BY:	
NP MEAD04NQ	NP 04NQNOTA	TK	Kevin N Comer BRIDGE ENGINEER

REMOVE SPALLED CONCRETE

1. It is the intent to remove only that deteriorated concrete that is visibly loose or visibly spalled. The loose or spalled material shall be removed by abrasive blast cleaning. Any loose or spalled material that cannot be removed by abrasive blasting alone shall be removed as stated in note number 2 below. Care shall be exercised during the removal operation not to nick, gouge, or in any other way damage the in-place reinforcing steel. Any damage to the in-place reinforcing steel shall be brought to the attention of the Bridge Construction Engineer and shall be repaired by the Contractor as directed by the Engineer at no additional cost to the Department.

2. General removal requirements:

   a. Concrete Removal shall be by jackhammers and chipping hammers or other methods approved by the Engineer.

   b. Jackhammers heavier than 30 pounds will not be permitted.

   c. Chipping hammers heavier than 15 pounds will not be permitted for removing concrete below the top of the top mat of reinforcing steel.

   d. Jackhammers and chipping hammers shall not be operated at an angle in excess of 45° measured from the surface of the concrete.

   e. Extreme care shall be taken when using jackhammers and chipping hammers to assure that existing reinforcing steel is not damaged or debonded from the sound concrete.

   f. Removal shall begin near the center of the loose concrete and shall progress outwardly until the loose concrete is removed and sound concrete is encountered such that the amount of concrete removal is minimized.

3. Remove Spalled Concrete will be measured to the nearest 0.1 foot and the area computed to the nearest 0.1 square yard. Remove Spalled Concrete will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to remove the specified concrete, concrete sawing, and disposing of removed material.

ABRASIVE BLASTING OF BRIDGE DECK

1. After grinding and removal of loose/spalled concrete, the entire bridge deck surface shall be thoroughly cleaned by abrasive blast cleaning to the satisfaction of the Engineer.

2. Upon completion of the abrasive blasting, the entire bridge deck shall be blown clean with dry compressed air to remove all dust and debris.

ABRASIVE BLASTING OF BRIDGE DECK (CONTINUED)

3. Cleaning by abrasive blasting and compressed air shall be done no more than 24 hours prior to the placement of the Nonmetallic Fiber Reinforced Concrete Overlay. In the event that the Nonmetallic Fiber Reinforced Concrete Overlay is not placed within 24 hours of abrasive blast cleaning or in the event of rain or other inclement weather contaminating the surface, the surface shall be re-cleaned by abrasive blast cleaning and dry compressed air.

4. No vehicular traffic shall be allowed on any portion of the deck which has been cleaned and prepared for application of the Nonmetallic Fiber Reinforced Concrete Overlay.

5. Abrasive Blasting of Bridge Deck will be measured to the nearest 0.1 foot and the area computed to the nearest 0.1 square yard. Abrasive Blasting of Bridge Deck will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to clean the bridge deck.

NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY

1. The overlay placed on the existing bridge deck shall consist of a Nonmetallic Fiber Reinforced Concrete.

2. The Nonmetallic Fiber Reinforced Concrete shall be Class A45 and conform to Section 460 of the Construction Specification except as modified by these notes.

3. A minimum thickness of 2” of Nonmetallic Fiber Reinforced Concrete shall be maintained on the bridge deck.

4. It will be necessary for the Contractor to shape the surface of the Nonmetallic Fiber Reinforced Concrete Overlay within one foot of the curb as detailed in the plans to insure that water drains to the floor drains or off the ends of the bridge.

5. No traffic will be allowed to operate on the scarified portion of the bridge deck. If it appears that the entire Nonmetallic Fiber Reinforced Concrete Overlay cannot be completed prior to winter, Remove and Replace Deteriorated Concrete shall not be done until work resumes in the spring. In the event that scarification has been started and due to unforeseen circumstances it becomes impossible to complete the placement of the Nonmetallic Fiber Reinforced Concrete Overlay on the entire surface of the structure prior to winter, the Office of Bridge Design shall be notified. Recommendations for handling winter traffic will then be made. These recommendations may include, but are not limited to, filling extra depth removal areas with Class A45 Concrete, placing an asphalt overlay on the uncompleted area so that the entire roadway width may be opened to traffic, removal of the asphalt overlay when work is resumed and scarifying an additional 1/4” of depth on the bridge deck. The cost of this work, including asphalt overlay, scarification, Class A45 Concrete, extra Nonmetallic Fiber Reinforced Concrete, and all other items incidental to this work, shall be at the expense of the Contractor.

NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY (CONTINUED)

6. A bridge deck finishing machine shall be used.

7. The Nonmetallic Fiber Reinforced Concrete at the time of placement shall contain 6.5 percent plus or minus 1.0 percent entrained air and slump of the concrete shall be maintained between 2.75 and 5.25 inches.

8. The Nonmetallic Fiber Reinforcement shall be a macro fiber approximately 1.5 inch or longer (W.R. Grace – STRUX 90/40 or approved equal) at an addition rate of 8 lb/cubic yard. The fiber shall be designed specifically for use in concrete and shall be supplied by a manufacturer with a documented history of providing fibers for use in concrete.

9 The minimum coarse aggregate content shall be 48 percent of the total aggregate in the mix by weight. The coarse aggregate shall conform to Size Number 3 gradation requirement of section 820 of the Construction Specifications.

10. Laboratory tests to determine the mix design proportions shall be performed according to Section 460.3.A. of the Construction Specifications and submitted to the Concrete Engineer for approval a minimum of 3 weeks prior to the test placement. This submittal shall include the mix and strength information from at least 3 trial batches.

11. A test placement of the Nonmetallic Fiber Reinforced Concrete will be required to determine acceptable mixing sequencing and finishing techniques before any Nonmetallic Fiber Reinforced Concrete is placed on the bridge deck. The test placement can be any location on or off of the project as approved by the Engineer. The test placement must be the same size as the anticipated batch size for the actual placement or as approved by the Engineer. The test pour shall be incidental to the contract price per cubic yard.

12. Mixing Concrete by Section 460.3.F of the Construction Specifications will not be allowed. Mixing Concrete by Section 460.3.E will be allowed as long as the mixing method ensures a uniform dispersement of the nonmetallic fibers in the concrete mix. The Contractor shall submit a mixing method to the Engineer for approval.

13. Nonmetallic Fiber Reinforced Concrete Overlay will be measured to the nearest cubic yard of concrete placed.

14. Nonmetallic Fiber Reinforced Concrete will be paid for at the contract unit price per cubic yard. Payment will be full compensation for labor, equipment, materials, and all incidental work required.

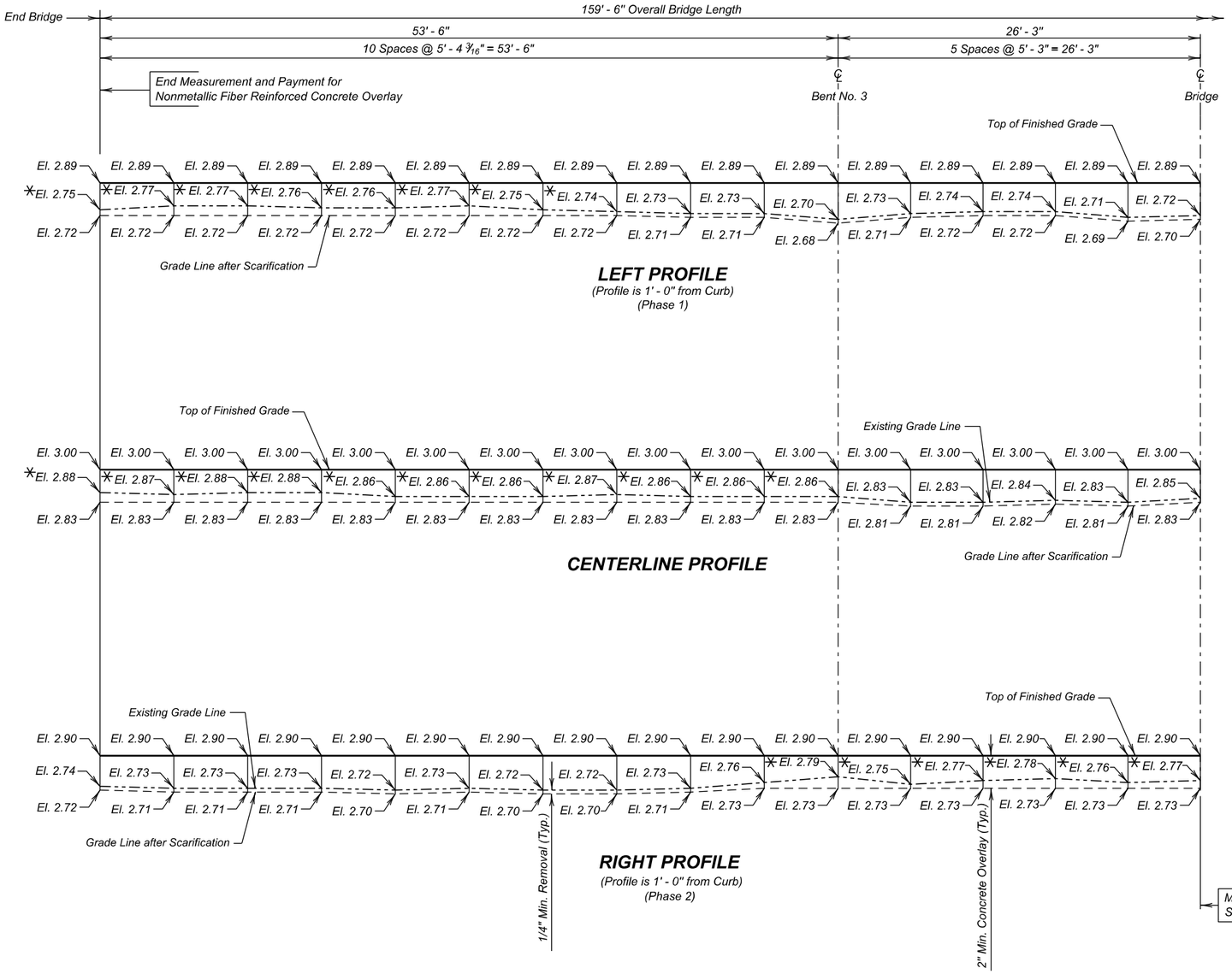
NOTES (CONTINUED)
FOR
159’ – 6” COMPOSITE I BEAM BRIDGE

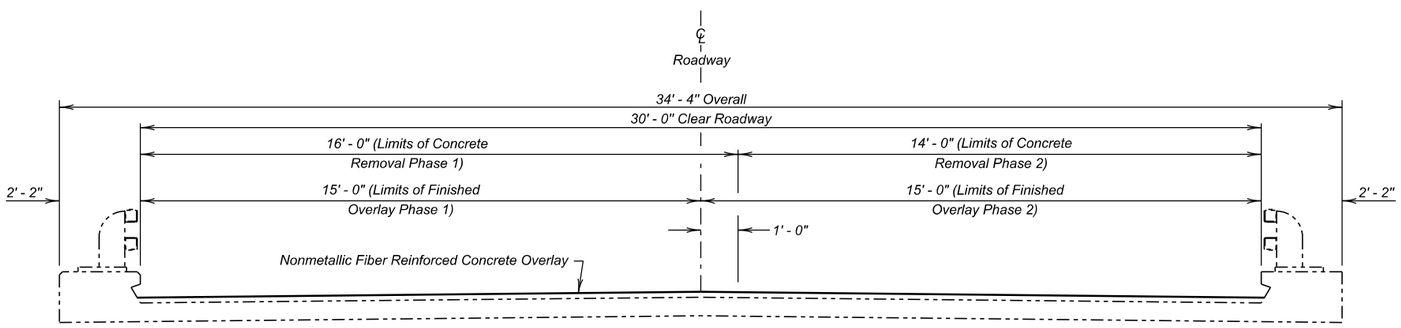
Str. No. 47-088-551

MAY 2013

DESIGNED BY:	DRAWN BY:	CHECKED BY:	
NP	NP	TK	Kevin N Borden
MEAD04NQ	04NQNOTA		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(183)44	23	44





TYPICAL SECTION

Benchmark Description:

Galvanized Steel Pipe
107.9 Ft West of the Northwest Corner of Bridge
Elevation 3516.06

0' .25' .5' 1.00'

VERTICAL SCALE

NOTE :
Add 3530.00 to all elevations shown on profiles.
✳ *Scarify in excess of ¼" in these areas.*

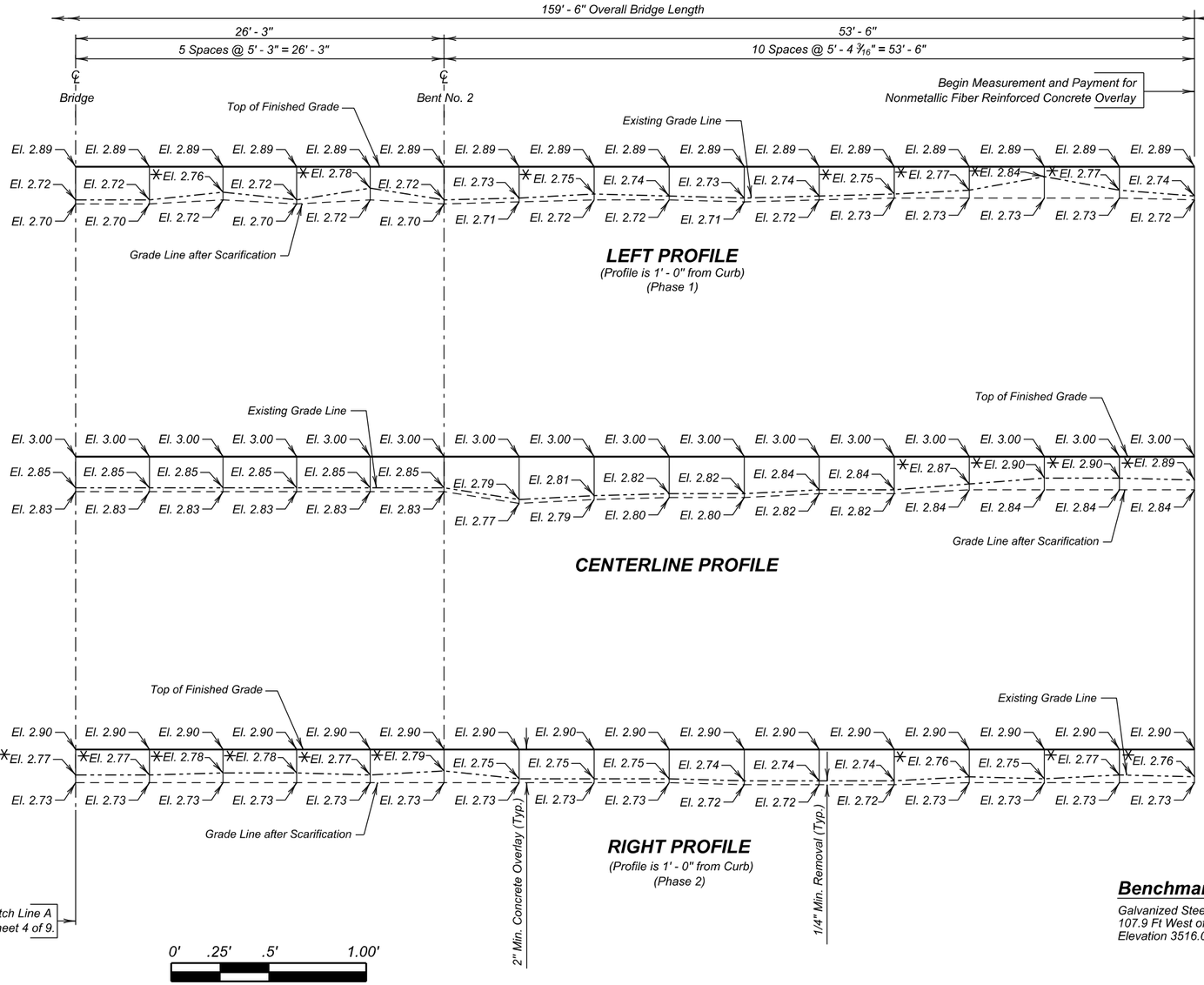
DECK PROFILE FOR NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY
FOR
159' - 6" COMPOSITE I BEAM BRIDGE

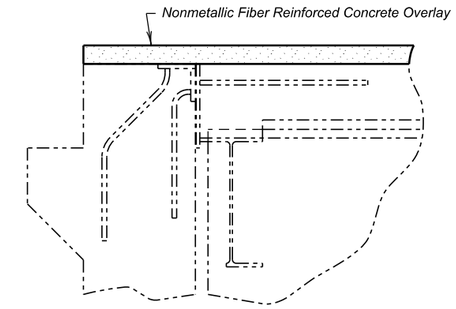
30' - 0" ROADWAY — 0° SKEW
OVER COUNTY ROAD — SEC. 4/9-T3N-R6E
STR. NO. 47-088-551 — IM 0901(183)44

MEADE COUNTY
S. D. DEPT. OF TRANSPORTATION
MAY 2013

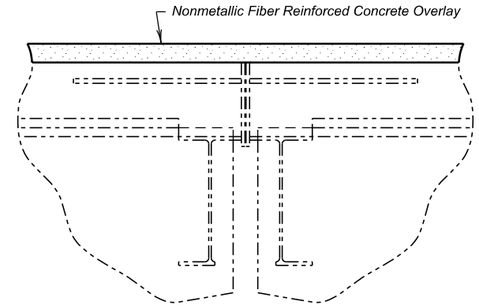
DESIGNED BY	CK. DES. BY	DRAFTED BY	
NP	TK	JRK	Kevin N. Goeden BRIDGE ENGINEER
MEAD04NQ	04NQLA04		

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(183)44	24	44





TYPICAL JOINT DETAIL AT ABUTMENTS



TYPICAL JOINT DETAIL AT BENTS

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY	
		Phase I	Phase 2
Remove Rubberized Asphalt Chip Seal	Sq. Yd.	283.6	248.2
Remove Spalled Concrete	Sq. Ft.	119.5	119.5
Nonmetallic Fiber Reinforced Concrete Overlay	Cu. Yd.	19.1	19.0
Abrasive Blasting of Bridge Deck	Sq. Yd.	265.9	265.9
Bridge Deck Grinding	Sq. Yd.	265.9	265.9
Finishing and Curing	Sq. Yd.	265.9	265.9

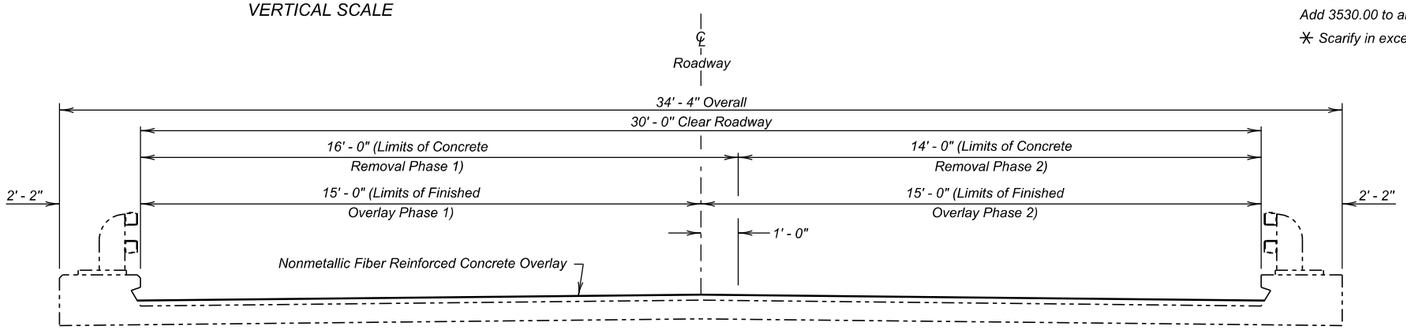
Benchmark Description:

Galvanized Steel Pipe
107.9 Ft West of the Northwest Corner of Bridge
Elevation 3516.06

NOTE :

Add 3530.00 to all elevations shown on profiles.

⚹ Scarify in excess of 1/4" in these areas.



TYPICAL SECTION

DECK PROFILE FOR NONMETALLIC FIBER REINFORCED CONCRETE OVERLAY (CONTINUED)
FOR
159' - 6" COMPOSITE I BEAM BRIDGE

30' - 0" ROADWAY
OVER COUNTY ROAD
STR. NO. 47-088-551

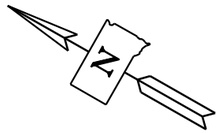
0° SKEW
SEC. 4/9-T3N-R6E
IM 0901(183)44

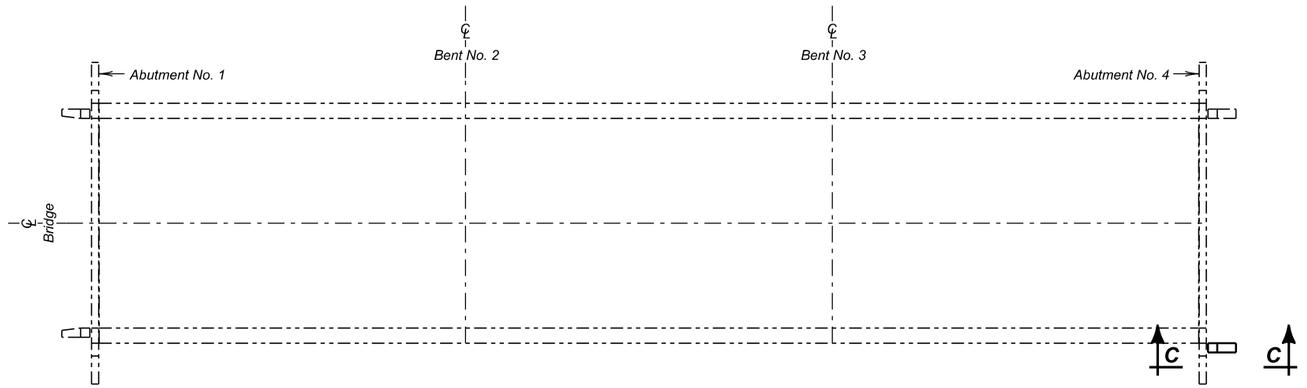
MEADE COUNTY
S. D. DEPT. OF TRANSPORTATION
MAY 2013

5 OF 9

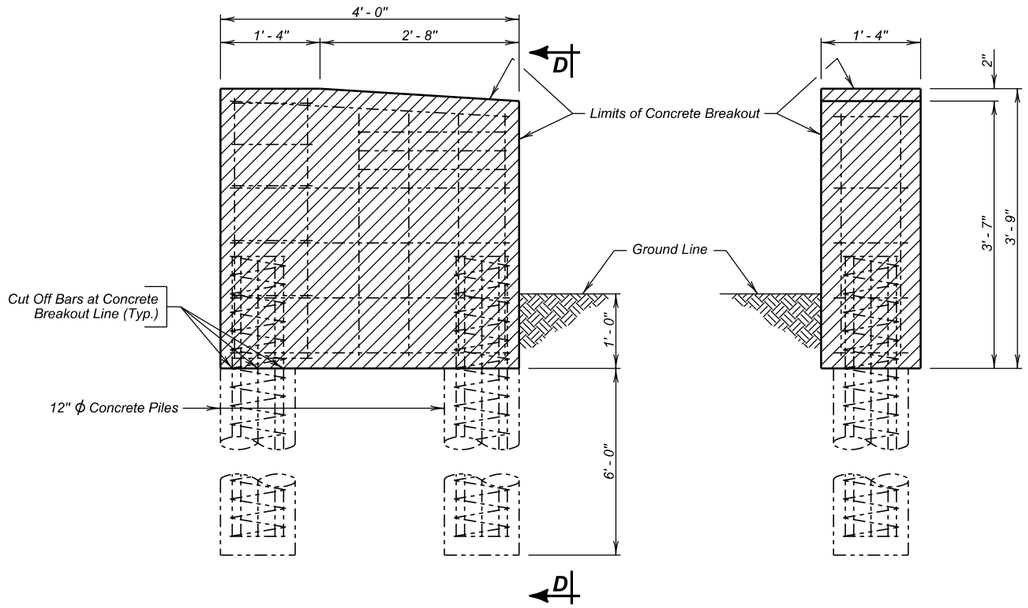
DESIGNED BY	CK. DES. BY	DRAFTED BY	
NP	TK	JRK	Kevin N. Goeden
MEAD04NQ	04NQLA05		BRIDGE ENGINEER

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	PROJECT	25	44





LAYOUT



VIEW C - C ***VIEW D - D***

ESTIMATED QUANTITIES		
ITEM	***UNIT***	***QUANTITY***
Breakout Structural Concrete	*Cu Yd*	*0.7*

END BLOCK REMOVAL

FOR

159' - 6" COMPOSITE I BEAM BRIDGE

30' - 0" ROADWAY — 0° SKEW

OVER COUNTY ROAD — SEC. 4/9-T3N-R6E

STR. NO. 47-088-551 — IM 0901(183)44

MEADE COUNTY

S. D. DEPT. OF TRANSPORTATION

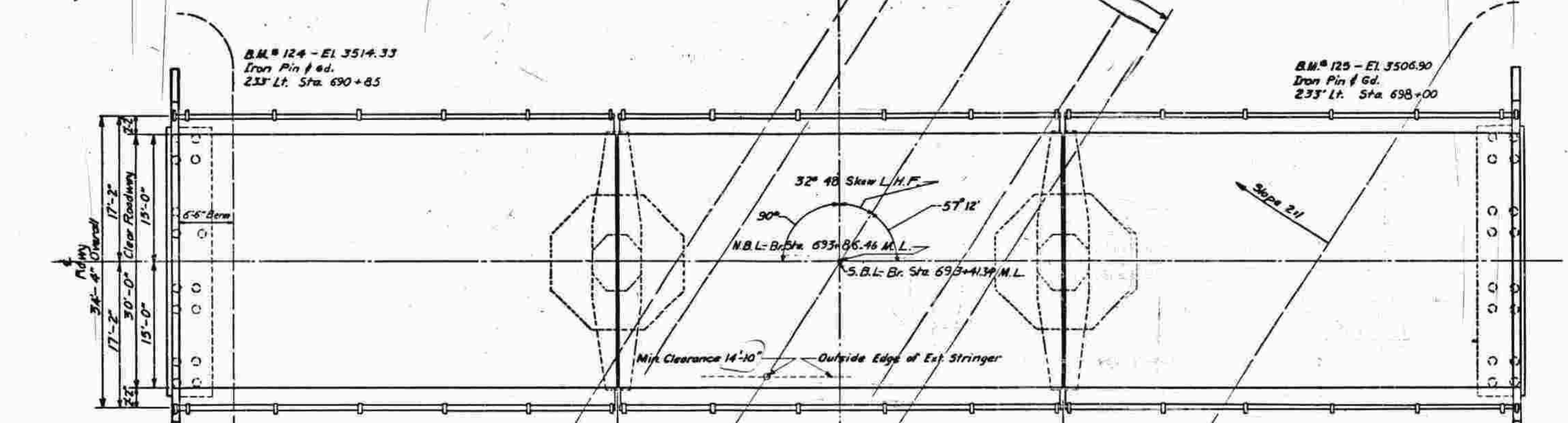
MAY 2013

6 OF 9

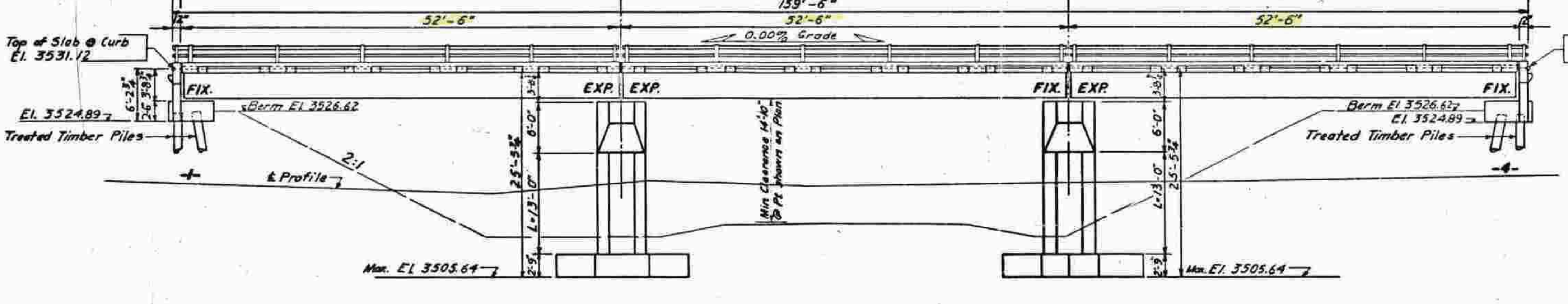
DESIGNED BY	CK. DES. BY	DRAFTED BY	
NP	TK	NP	Kevin N. Coeden
MEAD04NQ	04NQLA04		BRIDGE ENGINEER

-X231-

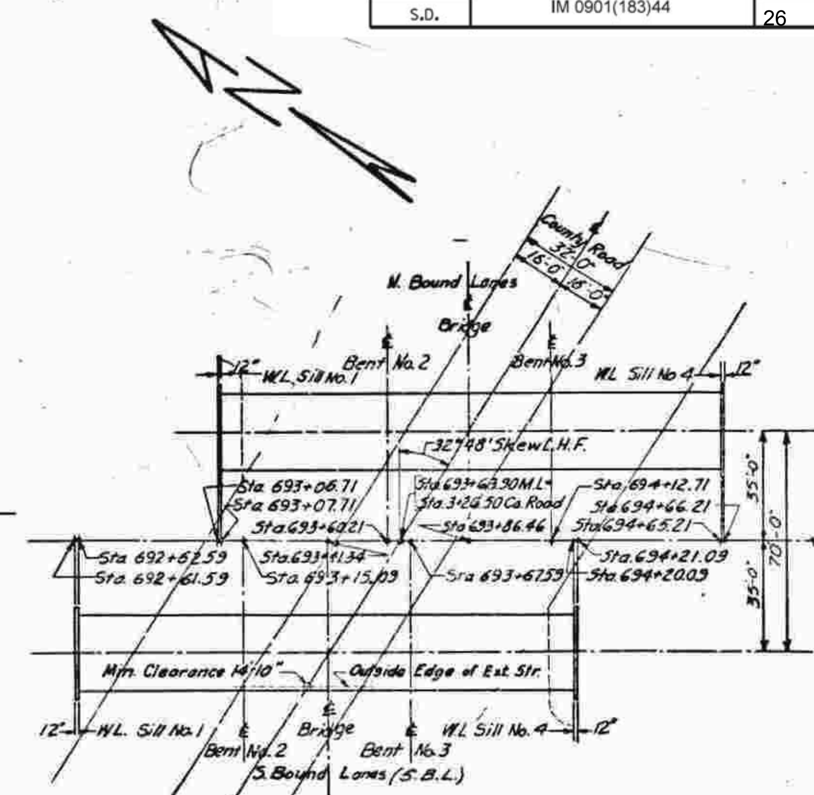
INDEX OF BRIDGE SHEETS:-



TYPICAL PLAN



TYPICAL ELEVATION



LAYOUT SKETCH

GENERAL NOTES.-

1. Use current South Dakota Standard Specifications for Roads and Bridges.
2. ~~In Section 51.3(m) of South Dakota Standard Specifications for Roads and Bridges, change the bearing value formula for gravity hammers to $P = \frac{8WH}{S+0.35} \times \frac{W}{W+M}$, where M equals the weight of the pile plus driving head, and all other values are the same as in the replaced formula.~~
3. For spread footing omit piles and reduce footing depth to 2'-9" leaving bottom footing re-steel 2'-3" from top. Strata shall develop a minimum bearing value of 4.5 tons per sq. ft. If bearing value is less than 4.5 tons per sq. ft. communicate with the office.

ESTIMATED QUANTITIES - 2 STR'S

ITEM	Cl. "A" Conc. Cu. Yds.	Steel - Lbs. Reinf.	Steel - Lbs. Struct.	Aluminum Railing Lin. Ft.	Treated Timber Piles - # Lin. Ft.	Excavation - Cu. Yds. Struct.	Excavation - Cu. Yds. ▲ Unclass.	● Sonotube 36" Ø - Lin. Ft.
Superstructure	227.4	54,300	227,340	638				
Sill No. 1 & No. 4	92.8	8,200	1,780		64 @ 20' = 1280	70		
Bent No. 2 & No. 3	234.9	56,250			[illegible]	220		72
					[illegible]			
Totals	555.1	117,750	229,120	638	# 1280	290	▲	● 72

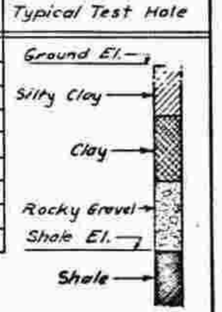
One Treated Timber Test Pile shall be driven at Sill No. 1 & No. 4 before remaining Timber Piles are ordered.
▲ See Grading Plans for Unclassified Excavation.
● Cost of Sonotube shall be included in the unit price bid for Class "A" Concrete.

TEST HOLE DATA

Station	Dist. from ℄ Survey	Ground Elevation	Clay Top El.	Rocky Gravel Top El.	Rocky Gravel Depth	Shale Top El.
692+61	35' Rt.	3518.0±	3517.0±	3512.0±	▲ 4.0'	
693+07	35' Lt.	16.4±	15.4±	13.4±	▲ 6.0'	
693+15	35' Rt.	17.3±	16.8±	13.3±	▲ 1.5'	
693+60	35' Lt.	15.8±	14.8±	12.3±	▲ 8.5'	
693+67	35' Rt.	17.4±	16.4±	09.4±	▲ 4.0'	
694+12	35' Lt.	14.1±	13.1±	09.1±	▲ 1.0'	
694+19	35' Rt.	18.6±	17.6±	06.1±	1.5'	3504.6±
694+64	35' Lt.	15.6±	14.6±	03.1±	4.5'	3498.6±

▲ Boulders & Gravel, could not drill any deeper.

Typical Test Hole



ORIGINAL CONSTRUCTION PLANS

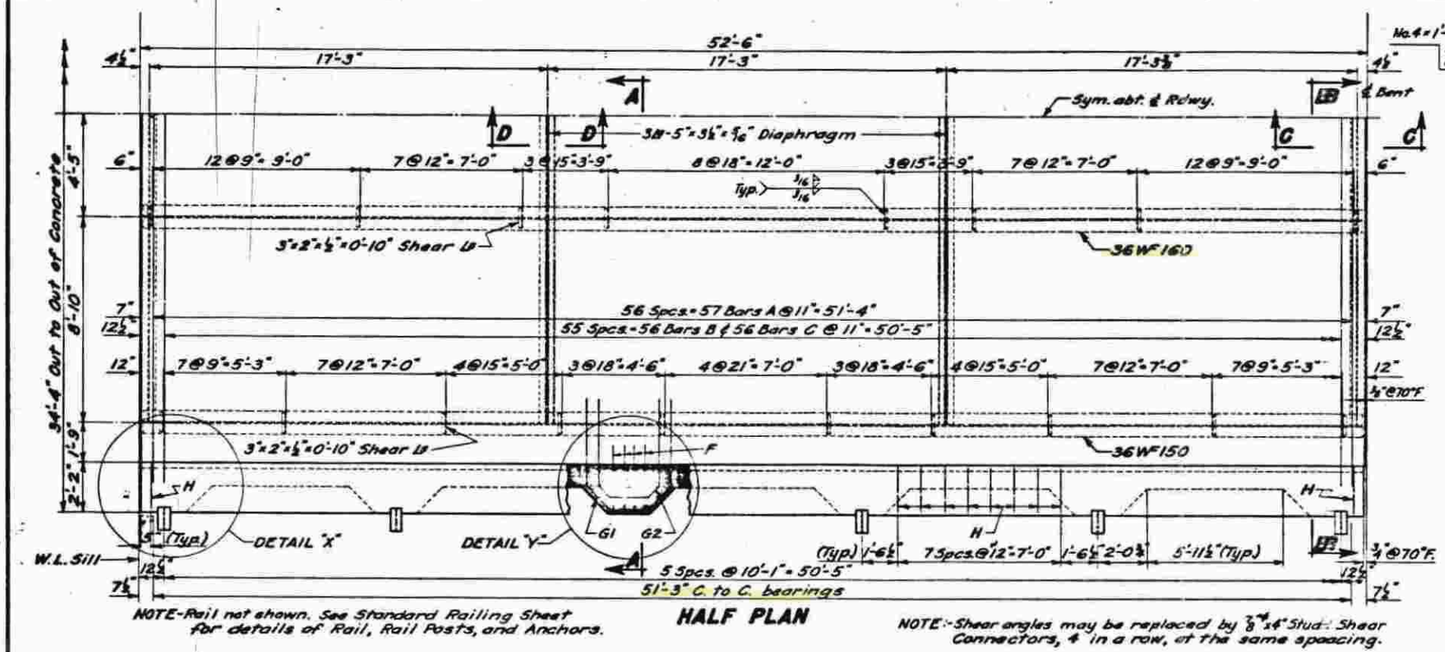
GENERAL DRAWING AND QUANTITIES
FOR
TWO 159'-6" COMP. I-BEAM VIADUCTS
30'-0" ROADWAY
OVER COUNTY ROAD SEC. 4/9-T3N-R6E
STA. 693+06.71 TO 694+66.21 N.B.L.-BR. IN-188(6)
STA. 692+61.59 TO 694+21.09 S.B.L.-BR.
STR. NO. 47-088-551 **MEADE COUNTY**
SOUTH DAKOTA H20-S16-44(8 AI
DEPARTMENT OF HIGHWAYS
APRIL 1957

7 OF 9

-X231-

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	MR	R.K.	[signature] BRIDGE ENGINEER

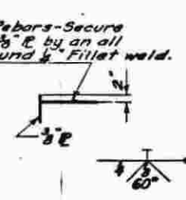
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(183)44	27	44

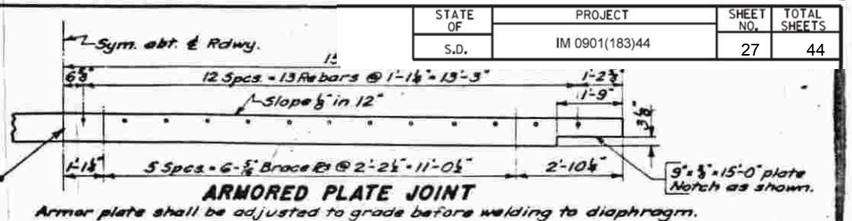


NOTE-Rail not shown. See Standard Railing Sheet for details of Rail, Rail Posts, and Anchors.

HALF PLAN

NOTE:-Shear angles may be replaced by ⅞"x6" Stud Shear Connectors, 4 in a row, at the same spacing.





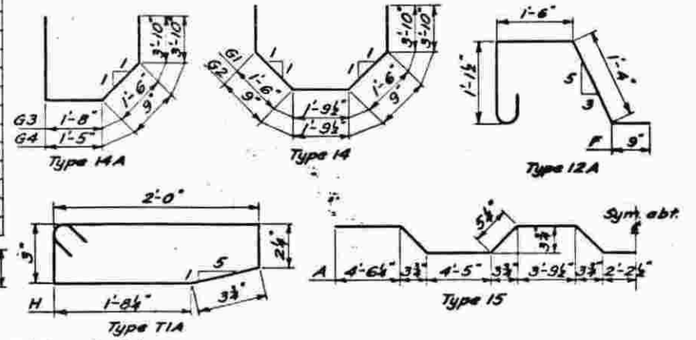
ARMORED PLATE JOINT

Armor plate shall be adjusted to grade before welding to diaphragm.

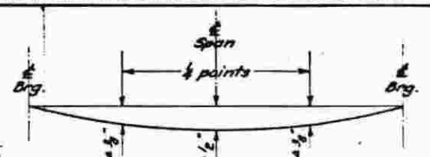
REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type
A	57	5	32'-6"	15
B	56	5	31'-9"	Str.
C	56	5	33'-9"	2
D	64	5	27'-3"	Str.
F	44	4	5'-3"	12A
G1	16	5	12'-6"	14
G2	16	5	11'-0"	14
G3	8	5	11'-9"	14A
G4	8	5	10'-3"	14A
H	84	3	5'-3"	T1A
J	32	4	27'-0"	Str.

Bending Details



NOTE:- All dimensions are out to out of bars.



DEAD LOAD DEFLECTION DIAGRAM

Δ Deflection due to concrete alone.

GENERAL NOTES—

Cost of welding shall be included in the unit price bid for Structural Steel.

Lead plates and lead washers shall be paid for under the item of Structural Steel.

All exposed steel surfaces shall be painted one shop coat of red lead paint and two field coats of aluminum or other approved paint.

Beams do not require mill cambering.

Cost of canvas and red lead under bearing plates shall be included in the unit price bid for Cl. "A" Conc.

All exposed concrete edges shall be chamfered 1 unless otherwise noted.

All Reinforcing Steel shall conform to A.S.T.M. A305 (current) and A15 (current)-Intermediate Grade.

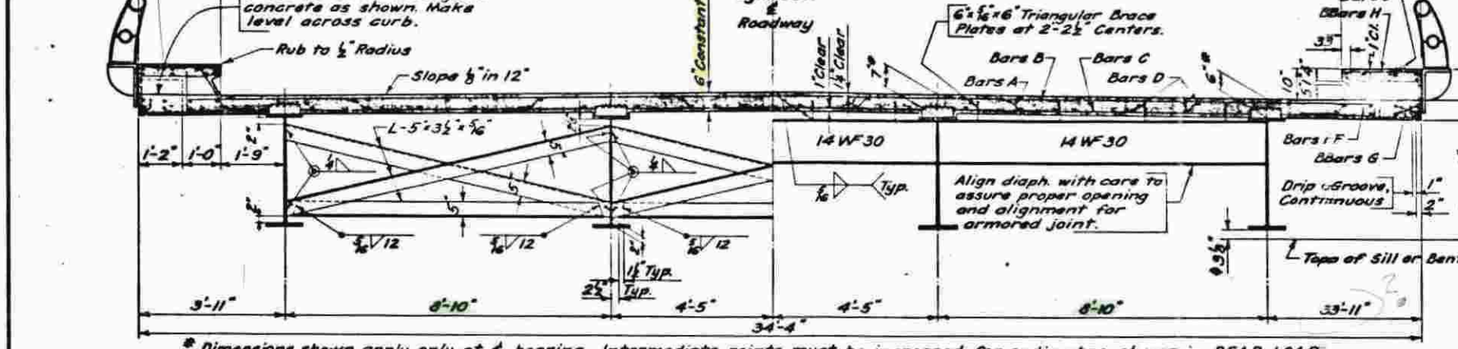
*Design Loading :- H20-S16-44 (T-Current) A.A.S.H.O. and Alternate Loading designated in P.P.M. 20-4, Sec. 4C.

Unit Stresses :- Re Steel f_s = 20,000 p.s.i. (intermed. Gd.)

Concrete f_c = 1600 p.s.i.

ESTIMATED QUANTITIES

		1-Abut. Span	1-Intermed. Span
Concrete-Cl. "A"	Cu. Yds.	37.8	37.8
Steel-Reinforcing	Lbs.	3050	3050
Steel-Structural	Lbs.	31880	31880
Railing	Lin. Ft.	107	105



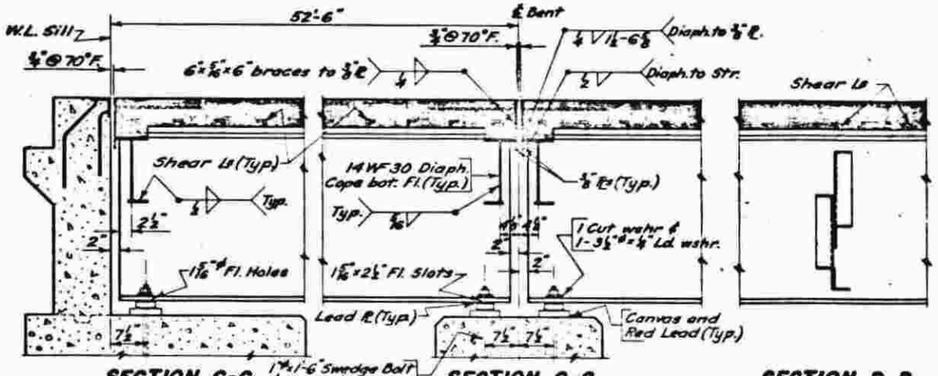
* Dimensions shown apply only at ℄ bearing. Intermediate points must be increased for ordinates shown in DEAD LOAD DEFLECTION DIAGRAM plus or minus any irregularity or deflection in beam when erected.

SECTION A-A

SECTION B-B

† See Sheet of "Special Details" for these dimensions if bridge is on other than level grade.

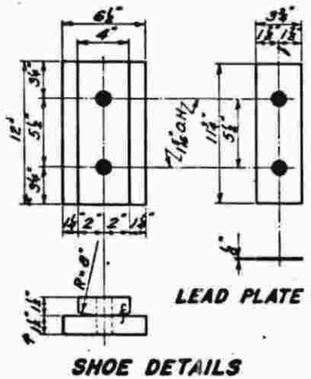
♦ Vary this dimension in accordance with variation of dimensions marked †.



SECTION C-C

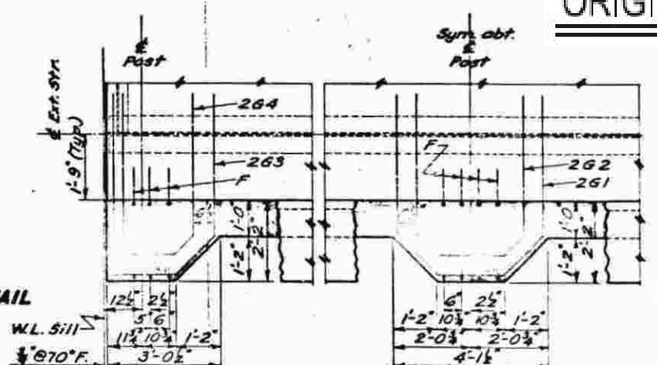
SECTION C-C

SECTION D-D



LEAD PLATE DETAIL

SHOE DETAILS



DETAIL "X"

DETAIL "Y"

ORIGINAL CONSTRUCTION PLANS

DETAILS FOR

STANDARD I-BEAM VIADUCT

COMPOSITE SECTION

30'-0" ROADWAY **52'-6" SPAN**

STR. NO. 47-088-551 SOUTH DAKOTA

DEPARTMENT OF HIGHWAYS

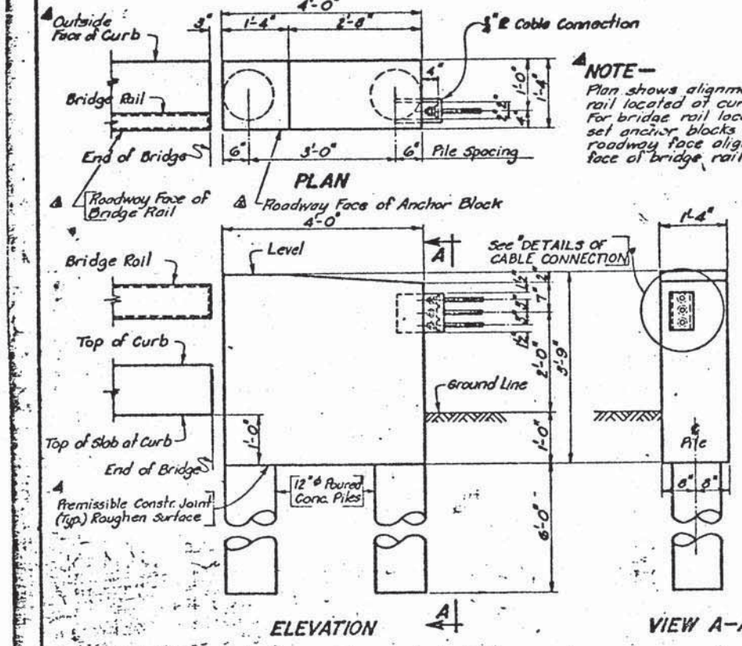
APRIL 1957

8 OF 9

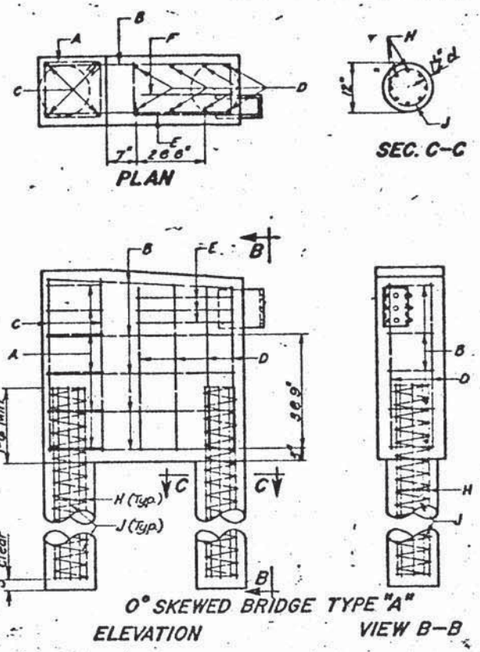
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	H.A.		BRIDGE ENGINEER

SIB-52.5-30-00-IN

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM 0901(183)44	28	44



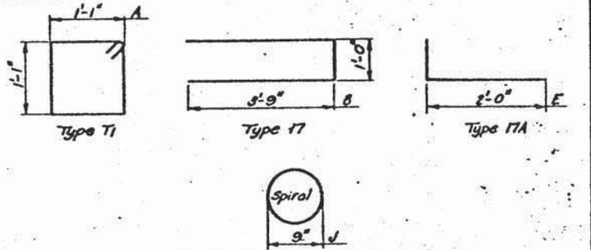
NOTE—
Plan shows alignment based on rail located at curb line of bridge. For bridge rail located otherwise, set anchor blocks so that its roadway face aligns with roadway face of bridge rail.



ϕ REINFORCING SCHEDULE

	Mk	No.	Size	Length	Type
0° Skewed Bridge Type "A"	A	6	4	5'-3"	T1
	B	5	5	6'-6"	17
	C	4	4	3'-6"	Str.
	D	8	4	3'-3"	Str.
	E	3	7	3'-0"	17A
	F	3	7	1'-8"	Str.
	H	16	5	7'-3"	Str.
	J	2	3	74'-6"	Spiral
Skewed Bridge Type "B"	A	6	4	5'-3"	T1
	B1	5	5	*	17
	C	5	4	3'-6"	Str.
	D	8	4	3'-3"	Str.
	E	3	7	3'-0"	17A
	F	3	7	1'-9"	Str.
	H	16	5	7'-3"	Str.
	J	2	3	74'-6"	Spiral
Skewed Bridge Type "C"	A	6	4	5'-3"	T1
	B1	5	5	*	17
	C	5	4	3'-6"	Str.
	D	8	4	3'-3"	Str.
	E	3	7	3'-0"	17A
	F	3	7	1'-9"	Str.
	H	16	5	7'-3"	Str.
	J	2	3	74'-6"	Spiral

Bending Details



Spirals - 3" pitch - 1½ extra turns at each end. Splice as required using a lap of 1½ turns or weld as approved by the BRIDGE SECTION.

* See TABLE A for length of B1 bars.
NOTE: All dimensions are out to out of bars.

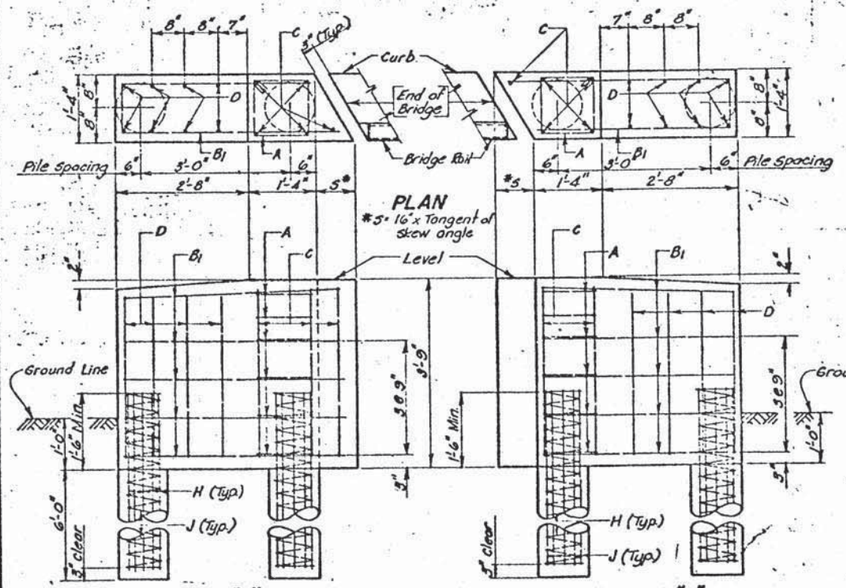
TABLE A

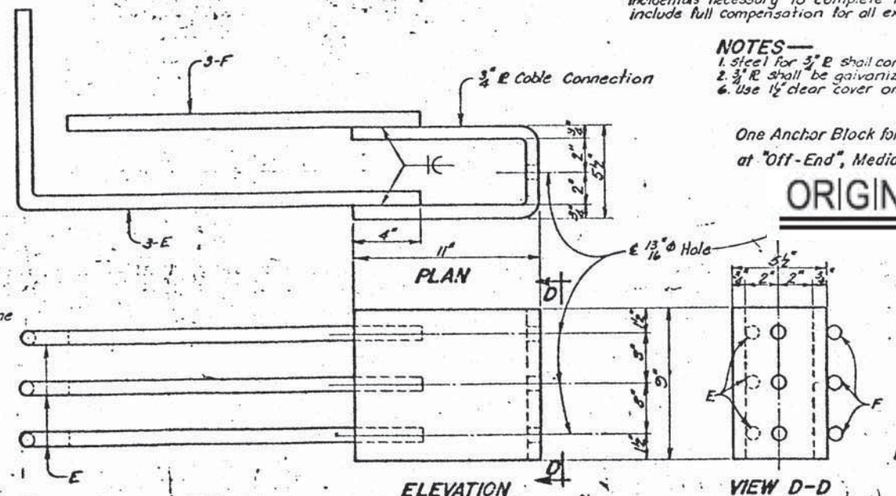
Skew	Length
10°	8'-6"
20°	8'-9"
30°	9'-0"
45°	9'-6"
60°	10'-3"

ϕ ESTIMATED QUANTITIES

ITEM	UNIT	SKEW ANGLE 0°	10°	20°	30°	45°	60°
Class M 6 Concrete	Cu. Yds.	11	11	11	11	12	12
Reinforcing Steel	Lbs.	300	300	300	300	305	305
Structure Excavation	Cu. Yds.	1.5	1.5	1.5	1.5	1.5	1.5
Structural Steel	Lbs.	50	50	50	50	50	50

ϕ Quantities shown are for 1 Anchor Block Type "A", "B" or "C" and are for informational purposes only. Payment for this item shall be the contract unit price each, complete in place, and shall be full compensation for furnishing all labor, material and incidentals necessary to complete the work. Payment for this item shall also include full compensation for all excavation and backfill which may be required.





NOTES—
1. Steel for ¾" ℄ shall conform to A.S.T.M. requirements for A36 steel.
2. ¾" ℄ shall be galvanized in accordance to AASHTO Specifications M111.
6. Use 1½" clear cover on all bars, except as shown.

One Anchor Block for Three Cable Guide Rail to be installed at "Off-End", Median Side of each bridge.

ORIGINAL CONSTRUCTION PLANS

2-159'-6" COMP. I-BEAM VIADUCTS

STR. NO. 47-088-550/551 190-1(50)44
MEADE COUNTY

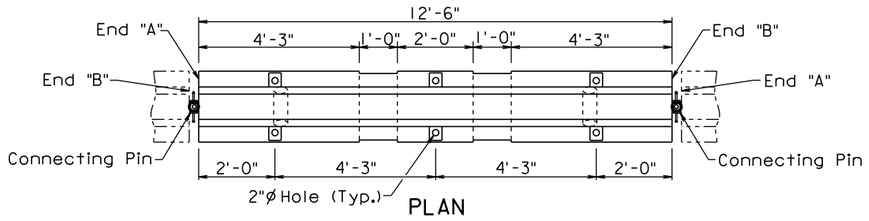
ANCHOR BLOCKS FOR THREE CABLE GUIDE RAIL AT BRIDGE ENDS
SOUTH DAKOTA
DEPARTMENT OF HIGHWAYS
JULY 1968
PREPARED BY BRIDGE SECTION

9 OF 9

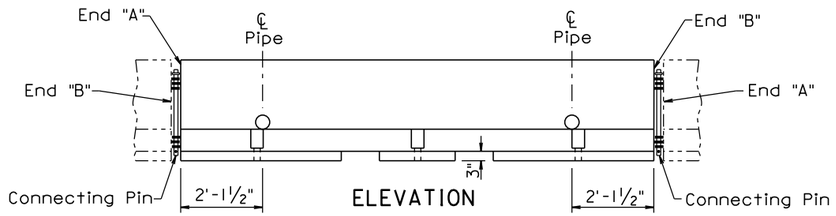
Rev. 8-3-70 D.O.
Rev. 6-2-69 M.L.L.

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED
	M.L.L.	R.K.	BRIDGE ENGINEER

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0901(183)44	29	44



PLAN



ELEVATION

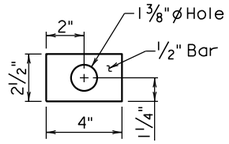
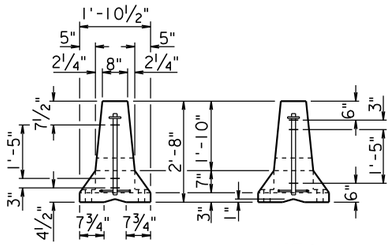
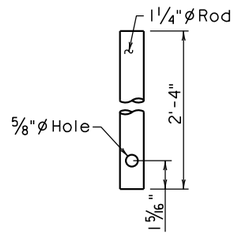


PLATE A

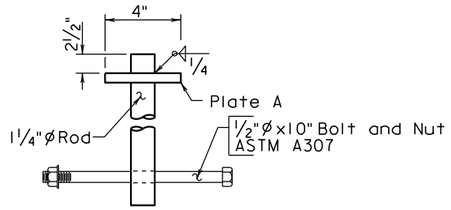


VIEW END A

VIEW END B



CONNECTING PIN DETAIL



ASSEMBLED CONNECTING PIN

June 26, 2009

Published Date: 3rd Qtr. 2013	SDDOT	TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS (F SHAPE INTERIOR SECTION)	PLATE NUMBER 628.01
			Sheet 1 of 2

GENERAL NOTES:

The detailed drawings are for illustrative purpose and depicts the current version of the F shape concrete barrier. If new movable concrete barriers are requested on a project, they shall be constructed according to the F shape movable concrete barrier details on standard plate 628.10.

Each movable concrete barrier section weighs 5030 ± pounds.

Each movable concrete barrier section is detailed to provide end "A" to end "B" connection by insertion of a pin through steel loops.

The Jersey shape or any version of the F shape traffic control movable concrete barriers may be used on a project, however, only the same type or version shall be used for each run of barriers.

Movable concrete barrier sections shall be placed to provide uniform bearing of the sections with the paved surface as approved by the Engineer.

Movable concrete barrier sections shall never be moved or lifted using the end loops.

Movable concrete barrier sections that have been damaged shall not be used. Barrier sections are considered damaged if the loops are end welded onto existing damaged loops, loops are fractured, or there is exposed rebar from fractured concrete.

All cost for transporting the barriers from the specified location to the project site, installing, and returning the barriers to the specified location shall be incidental to the contract unit price per each for "Traffic Control Movable Concrete Barrier".

If the concrete barriers need to be moved and reset on the project, requiring the barriers to be transported by truck, all cost for removing, transporting, and resetting the barriers shall be incidental to the contract unit price per each for "Remove and Reset Traffic Control Movable Concrete Barrier". All cost for small shifts in alignment of the barriers, not requiring the barriers to be transported by truck, shall be incidental to various contract items.

June 26, 2009

Published Date: 3rd Qtr. 2013	SDDOT	TRAFFIC CONTROL MOVABLE CONCRETE BARRIERS (F SHAPE INTERIOR SECTION)	PLATE NUMBER 628.01
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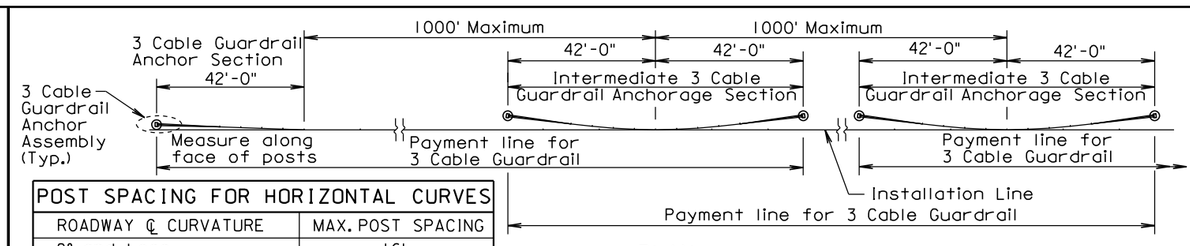
Published Date: 2nd Qtr. 2013

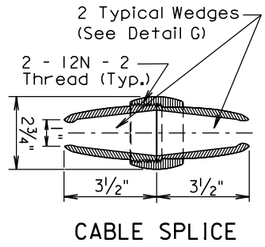
SDDOT

3 CABLE GUARDRAIL



PLAN

POST SPACING FOR HORIZONTAL CURVES	
ROADWAY ℄ CURVATURE	MAX. POST SPACING
8° and Less	16'
Greater than 8° to 13°	12'
Greater than 13°	NOT ALLOWED



CABLE SPLICE

GENERAL NOTES:

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

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

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

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

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

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

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

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

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

PLATE NUMBER 629.01

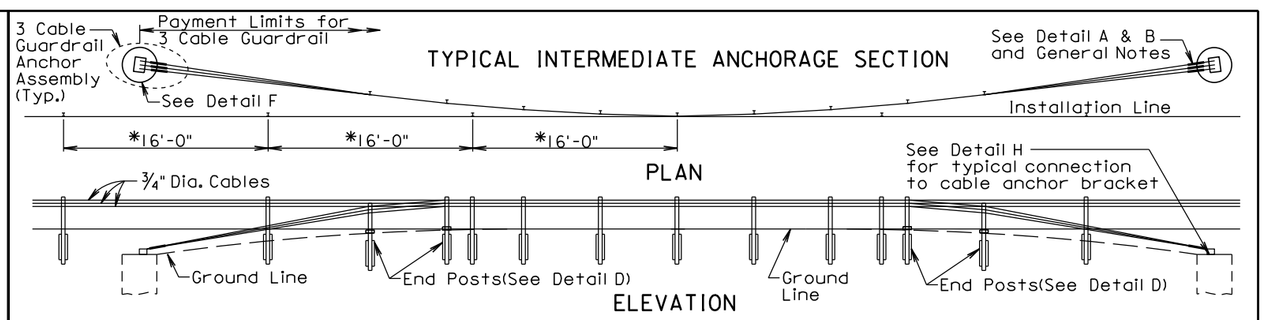
December 23, 2010

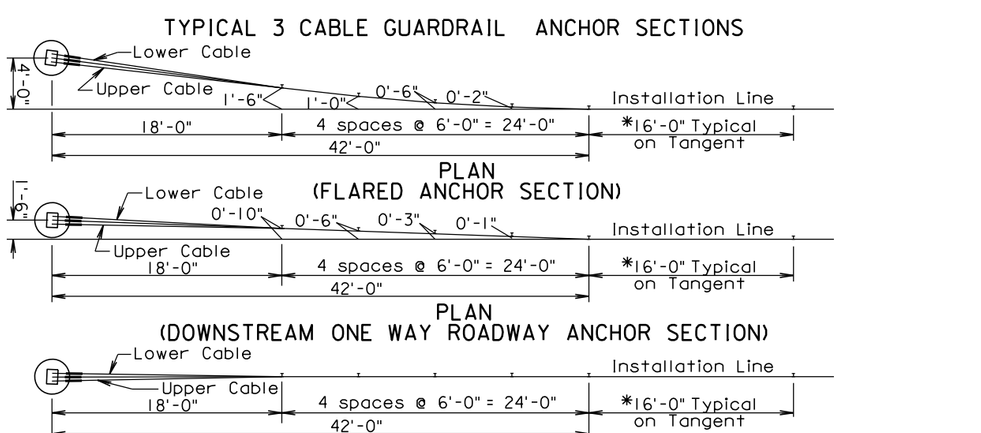
Sheet 1 of 6

Published Date: 2nd Qtr. 2013

SDDOT

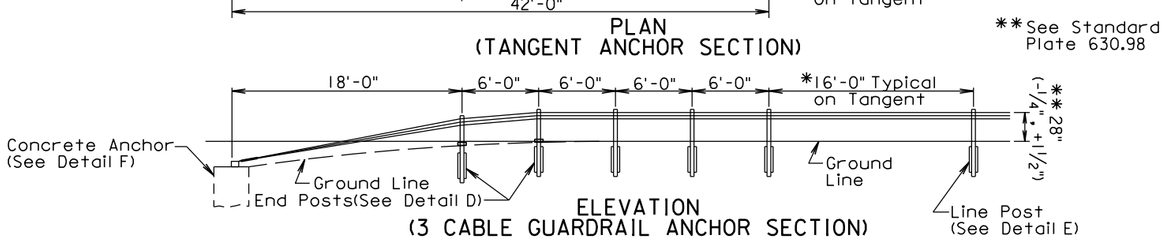
3 CABLE GUARDRAIL





* See Table on Sheet 1 for post spacing on horizontal curves.

** See Standard Plate 630.98



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December 23, 2010

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STATE OF SOUTH DAKOTA

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SHEET NO. 30

TOTAL SHEETS 44

Published Date: 2nd Qtr. 2013

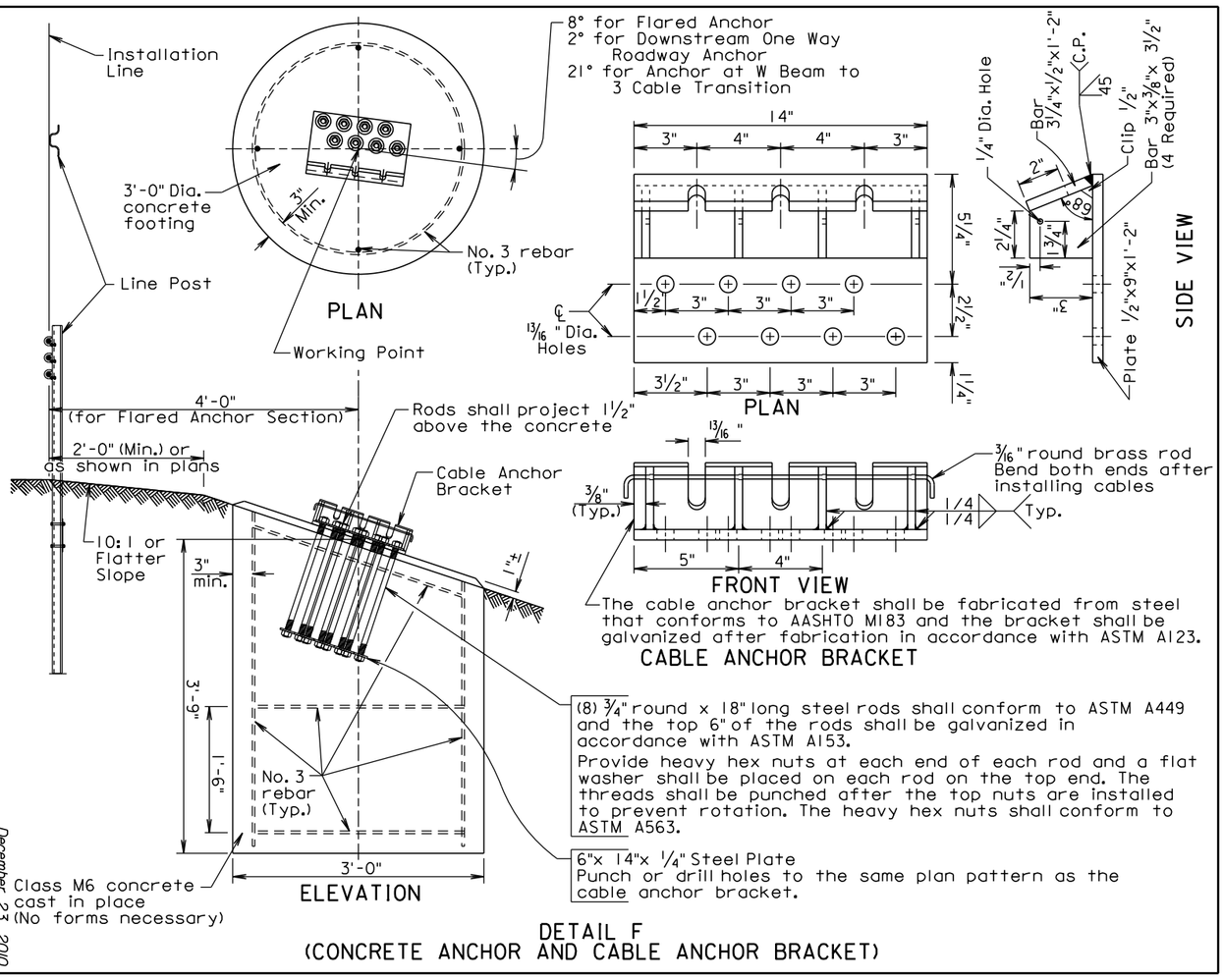
SDDOT

3 CABLE GUARDRAIL

PLATE NUMBER 629.01

Sheet 3 of 6

December 23, 2010



DETAIL F
(CONCRETE ANCHOR AND CABLE ANCHOR BRACKET)

Published Date: 2nd Qtr. 2013

SDDOT

3 CABLE GUARDRAIL

PLATE NUMBER 629.01

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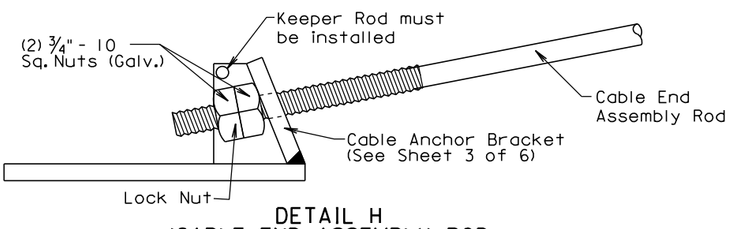
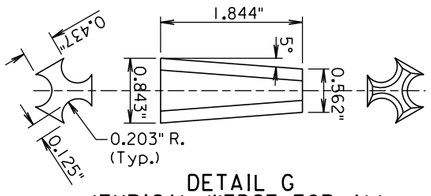
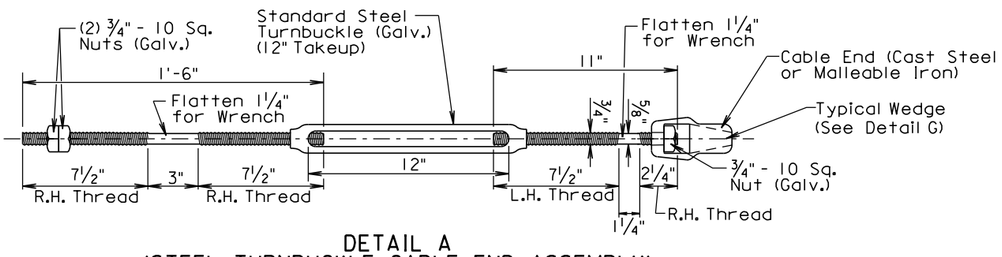
December 23, 2010



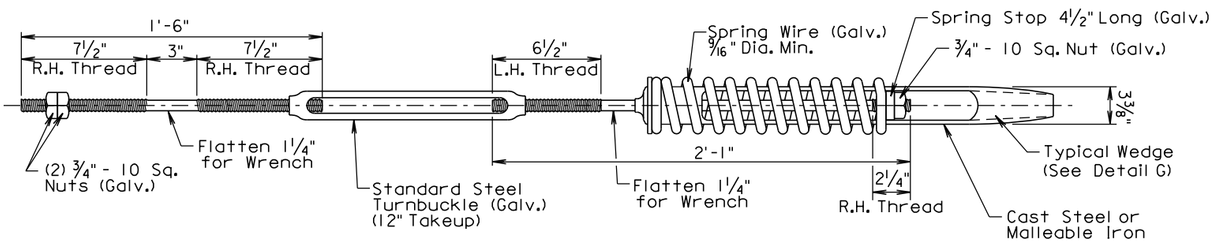
DETAIL H
(CABLE END ASSEMBLY ROD
CONNECTION TO CABLE ANCHOR BRACKET)



DETAIL G
(TYPICAL WEDGE FOR ALL
SPLICES AND CABLE
FITTINGS)



DETAIL A
(STEEL TURNBUCKLE CABLE END ASSEMBLY)
Minimum Tensile Strength = 25,000 Lbs.



DETAIL B
(SPRING CABLE END ASSEMBLY WITH TURNBUCKLE)
(COMPENSATING DEVICE)

STATE OF SOUTH DAKOTA

PROJECT IM 0901(183)44

SHEET NO. 31

TOTAL SHEETS 44

Published Date: 2nd Qtr. 2013

SDDOT

3 CABLE GUARDRAIL

PLATE NUMBER 629.01

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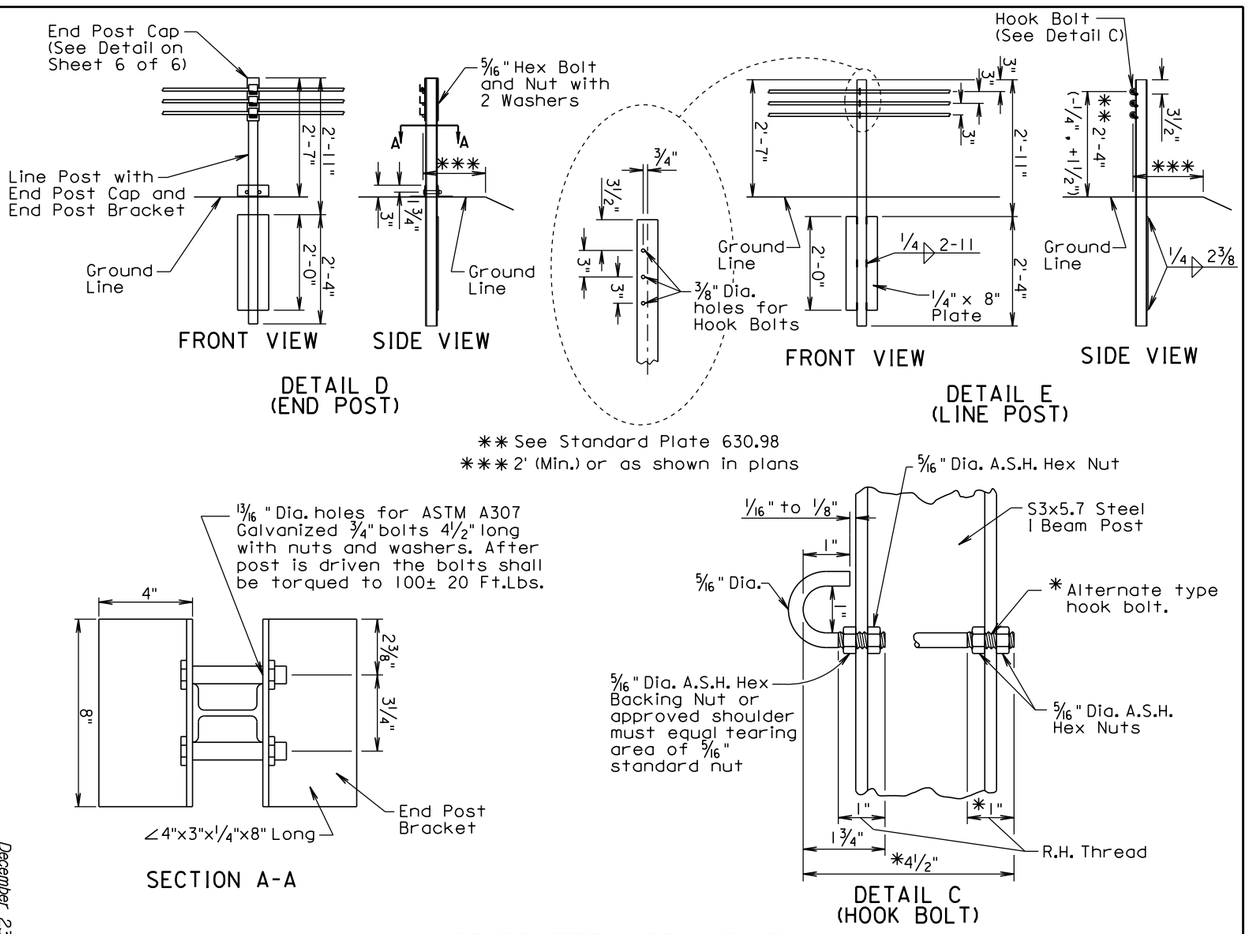
December 23, 2010



Published Date: 2nd Qtr. 2013

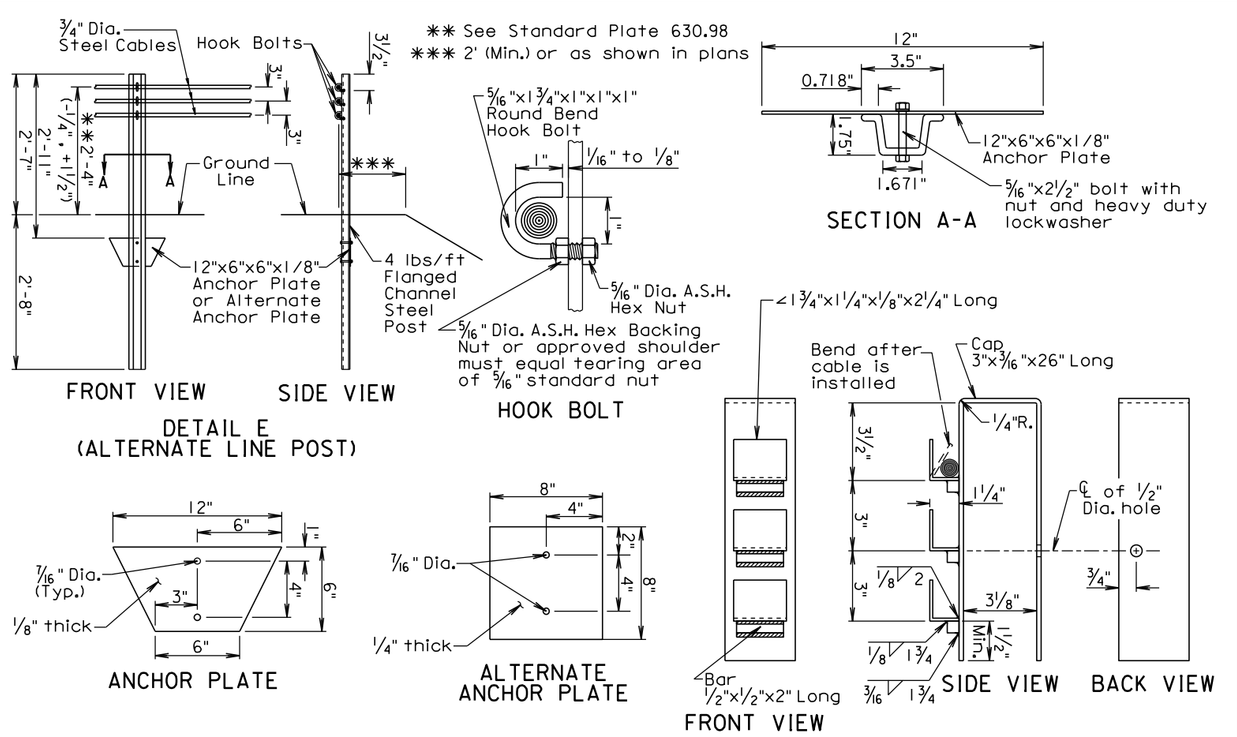
SDDOT

3 CABLE GUARDRAIL

PLATE NUMBER 629.01

Sheet 6 of 6

December 23, 2010



GENERAL NOTES:

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

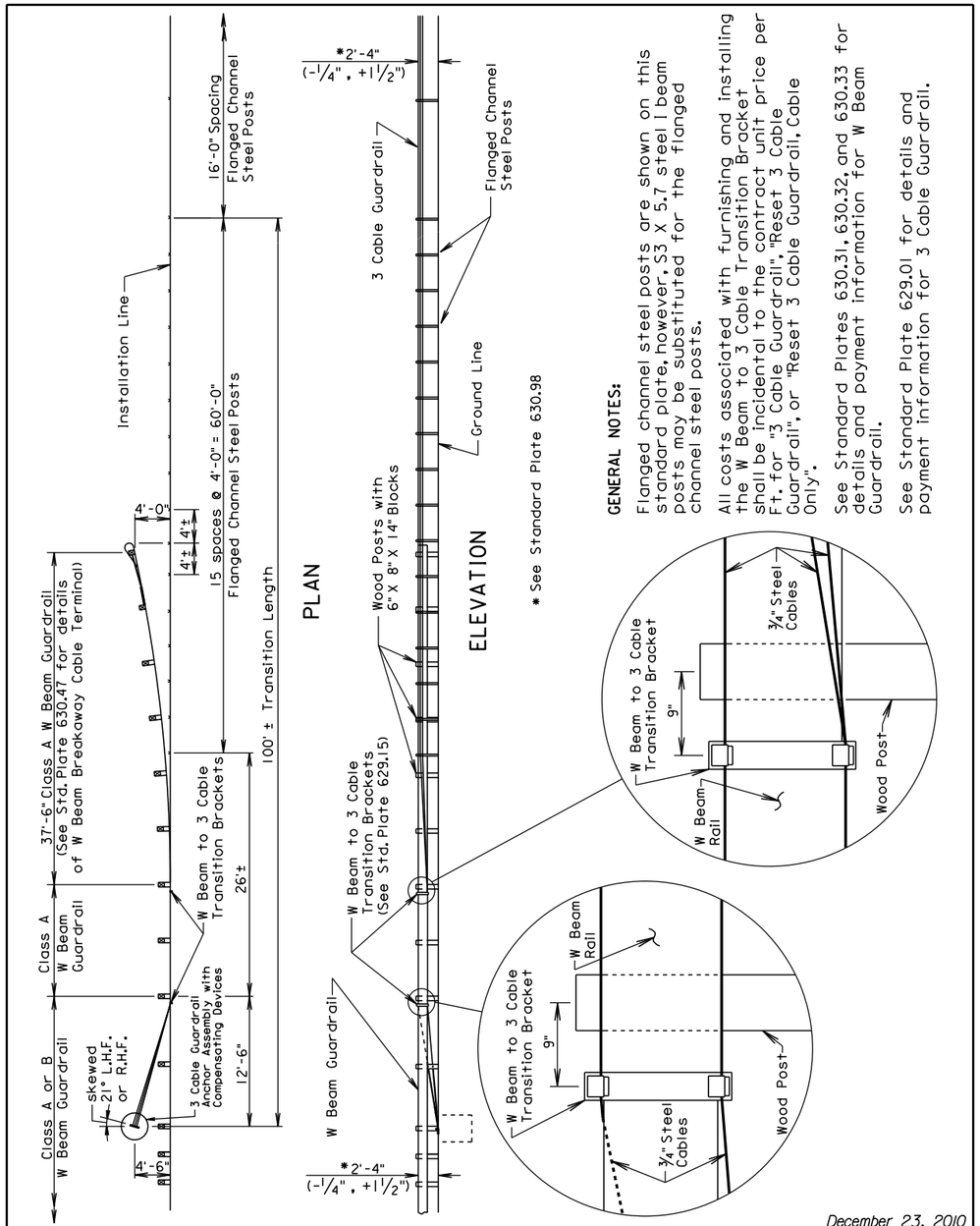
STATE OF SOUTH DAKOTA

PROJECT IM 0901(183)44

SHEET NO. 32

TOTAL SHEETS 44

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0901(183)44	33	44



GENERAL NOTES:

Flanged channel steel posts are shown on this standard plate, however, S3 X 5.7 steel I beam posts may be substituted for the flanged channel steel posts.

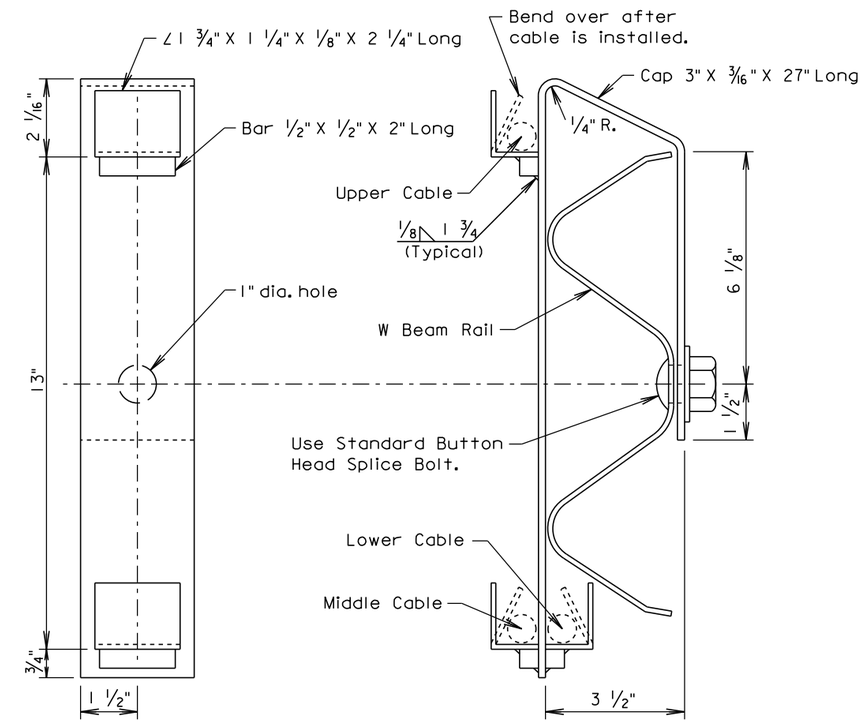
All costs associated with furnishing and installing the W Beam to 3 Cable Transition Bracket shall be incidental to the contract unit price per Ft. for "3 Cable Guardrail", "Reset 3 Cable Guardrail", or "Reset 3 Cable Guardrail, Cable Only".

See Standard Plates 630.31, 630.32, and 630.33 for details and payment information for W Beam Guardrail.

See Standard Plate 629.01 for details and payment information for 3 Cable Guardrail.

December 23, 2010

Published Date: 2nd Qtr. 2013	SDDOT	W BEAM TO 3 CABLE TRANSITION	PLATE NUMBER 629.05
			Sheet 1 of 1



ELEVATION
(TRANSITION BRACKET)

END VIEW
(W BEAM RAIL AND TRANSITION BRACKET)

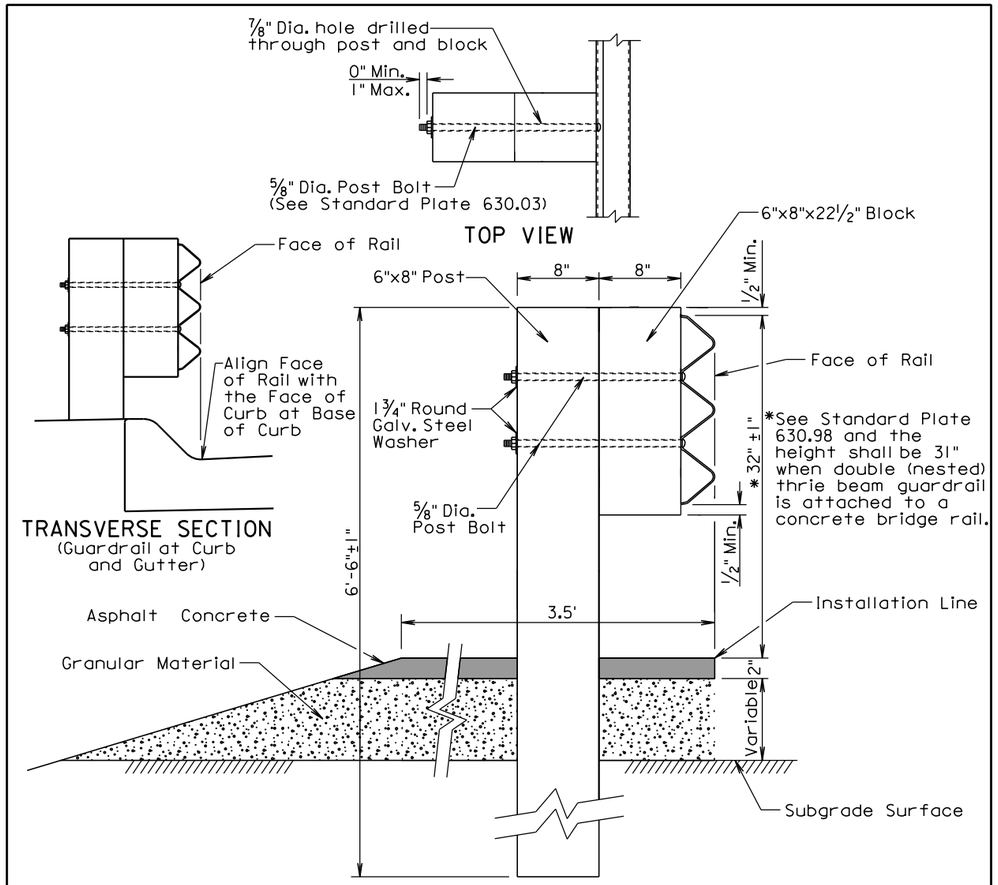
GENERAL NOTES:

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

March 31, 2000

Published Date: 2nd Qtr. 2013	SDDOT	W BEAM TO 3 CABLE TRANSITION BRACKET	PLATE NUMBER 629.15
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0901(183)44	34	44



TRANSVERSE SECTION

GENERAL NOTES:

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

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

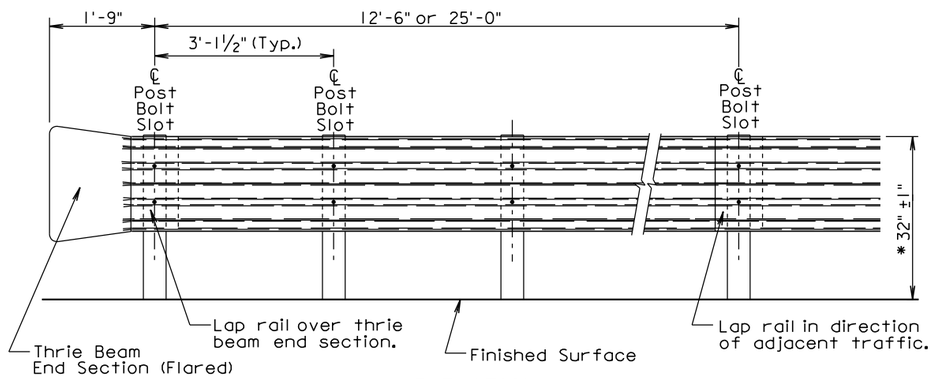
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "Thrie Beam Guardrail" bid item.

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

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

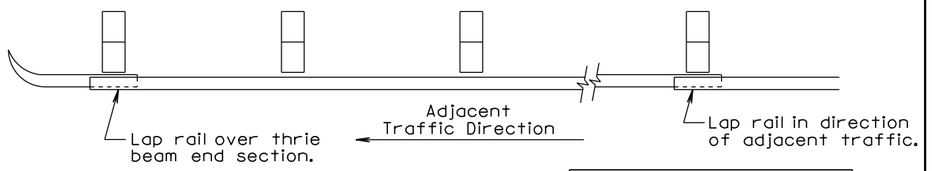
December 23, 2010

Published Date: 2nd Qtr. 2013	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'-1 1/2"	1'-9"

For Informational Purposes Only

GENERAL NOTES:

All thrie beam rail shall be Type 1.

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

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

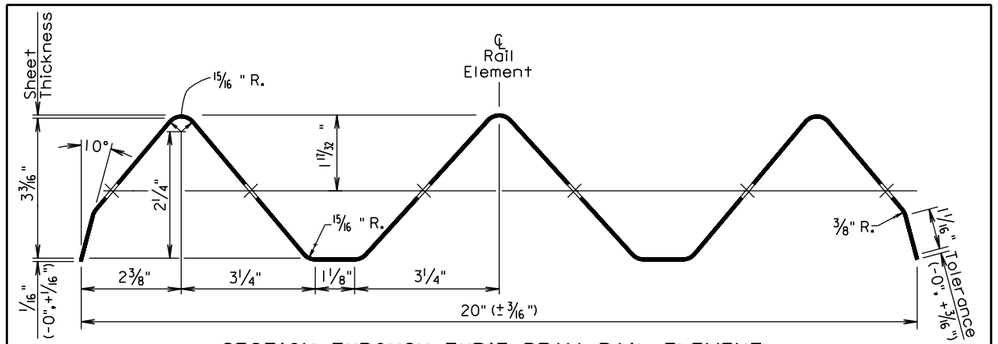
Thrie Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for Thrie Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

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

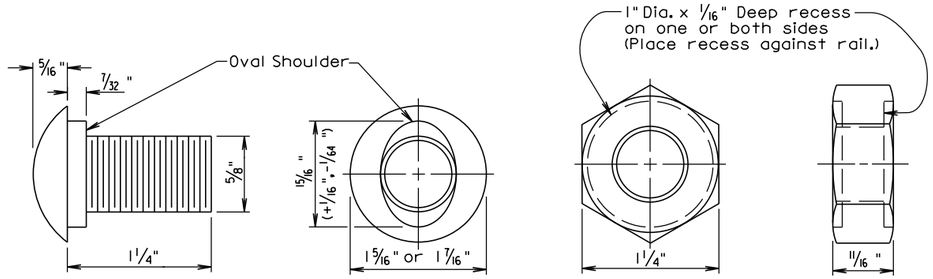
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "Thrie Beam Guardrail" bid item.

December 23, 2010

Published Date: 2nd Qtr. 2013	SDDOT	THRIE BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.02
			Sheet 1 of 1

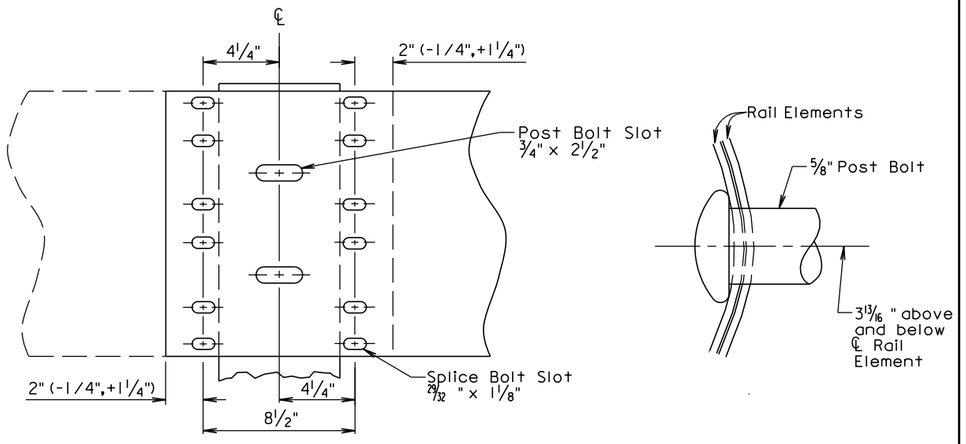


SECTION THROUGH THRIE BEAM RAIL ELEMENT



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

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

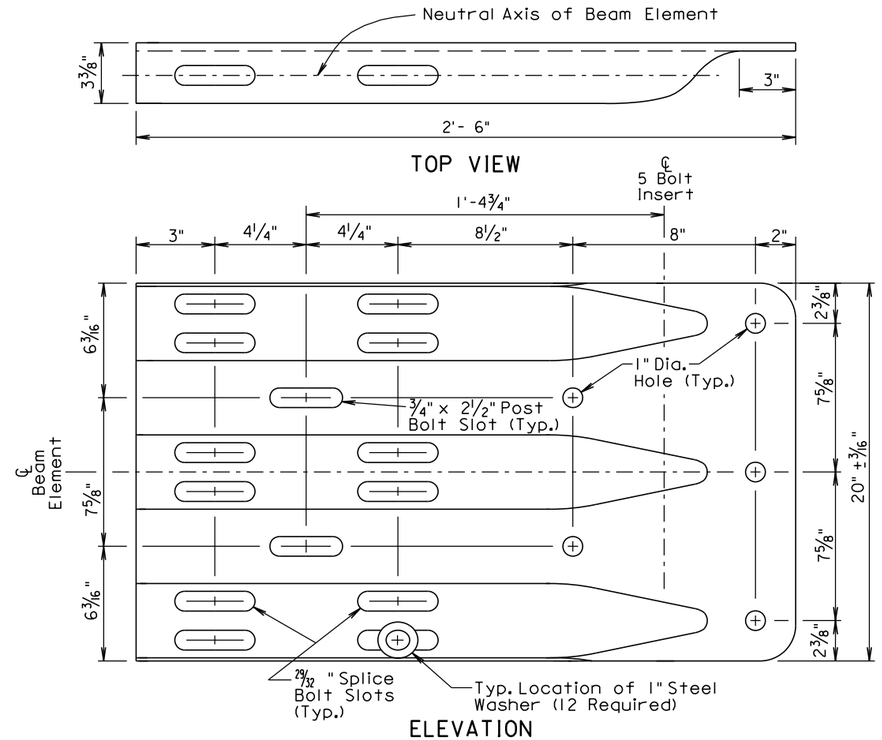


Lap in direction of traffic.

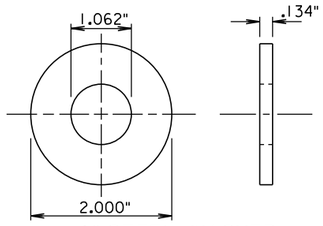
RAIL SPLICE

March 31, 2000

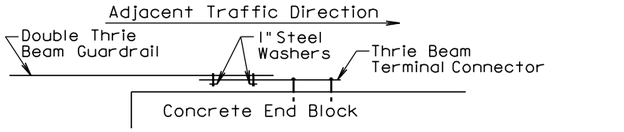
Published Date: 2nd Qtr. 2013	SDDOT	THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.03
			Sheet 1 of 1

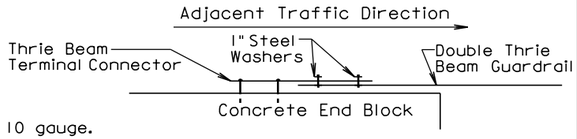


ELEVATION
THRIE BEAM TERMINAL CONNECTOR



1" STEEL WASHER





GENERAL NOTES:

Thrie Beam Terminal Connectors shall be 10 gauge.

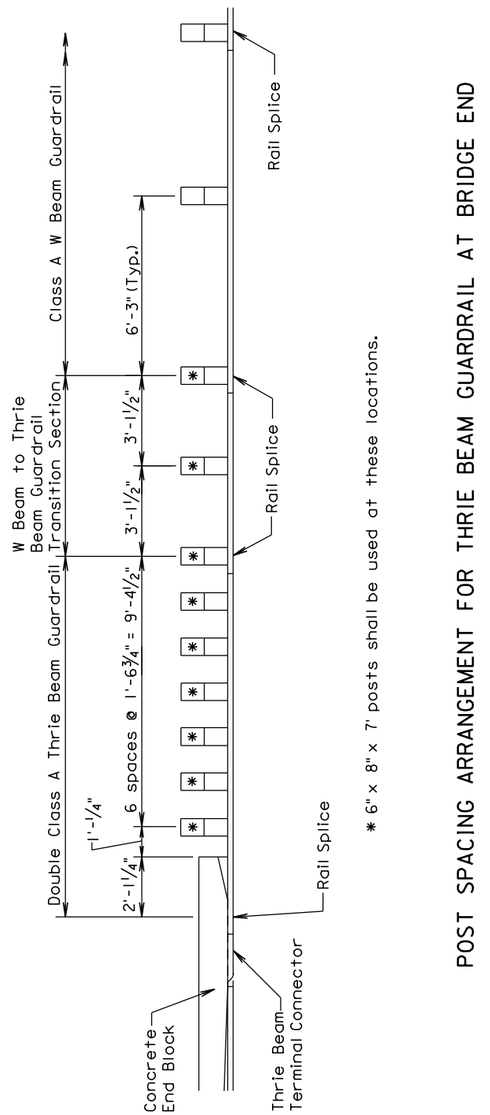
When the thrie beam terminal connector is used to connect the rail to the bridge, 1" steel washers shall be used at the lap splice and the washers shall be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of the 1" steel washers.

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: 2nd Qtr. 2013	SDDOT	THRIE BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER	PLATE NUMBER 630.05
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0901(183)44	36	44

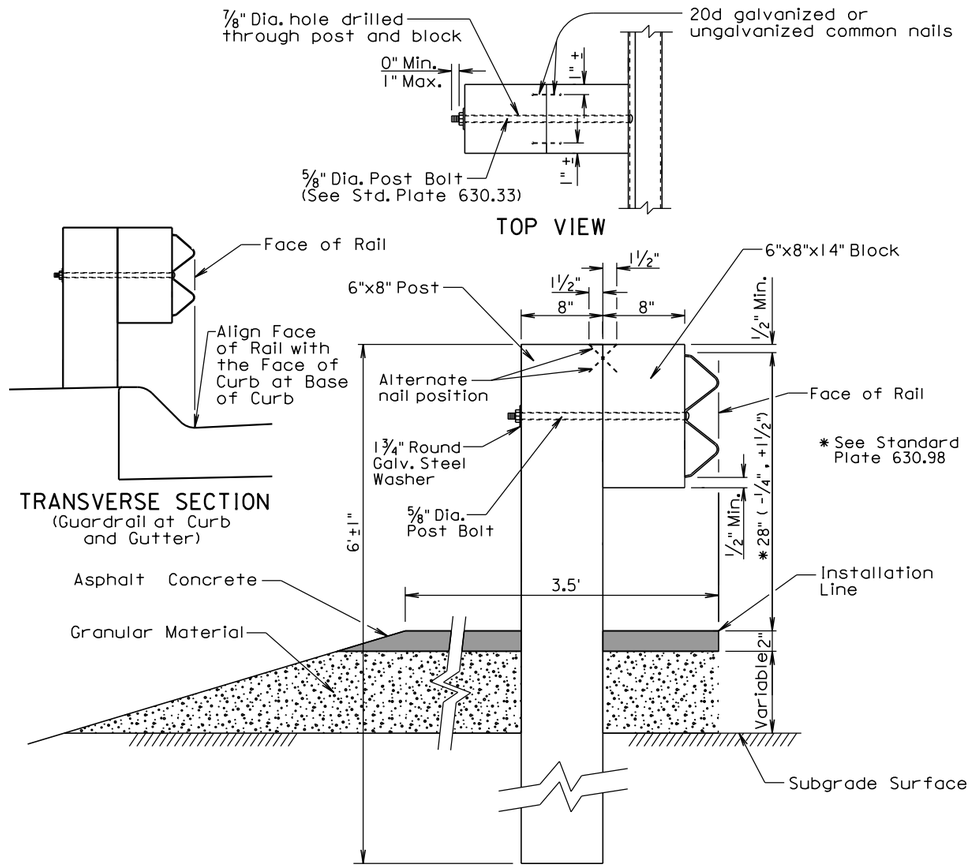


* 6" x 8" x 7' posts shall be used at these locations.

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

Published Date: 2nd Qtr. 2013	SDDOT	POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END	PLATE NUMBER 630.15
			Sheet 1 of 1



TRANSVERSE SECTION

GENERAL NOTES:

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

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

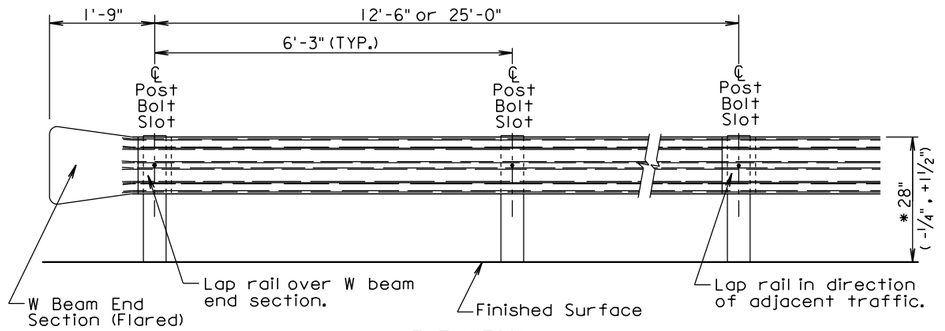
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

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

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

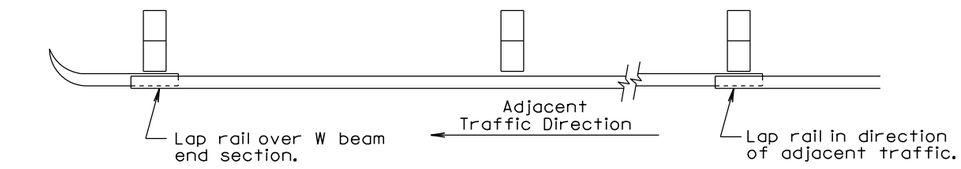
December 23, 2010

Published Date: 2nd Qtr. 2013	SDDOT	W BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.31
			Sheet 1 of 1



ELEVATION

*See Standard Plate 630.98



PLAN

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

For Informational Purposes Only

GENERAL NOTES:

All W beam rail shall be Type 1.

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

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

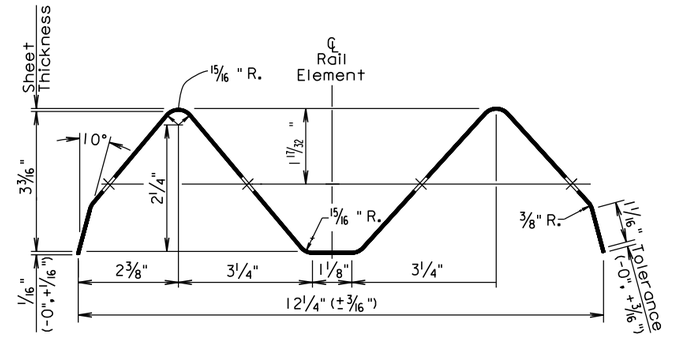
W Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for W Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

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

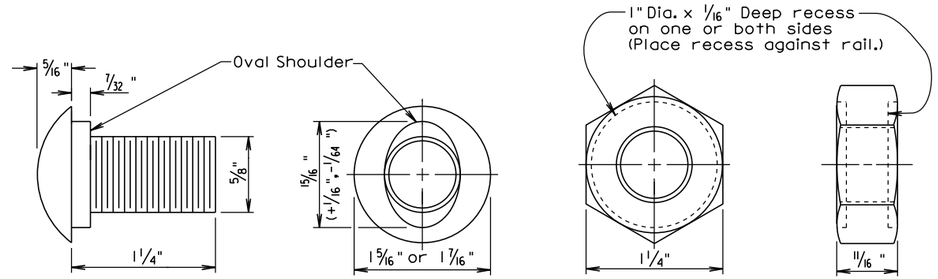
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

December 23, 2010

Published Date: 2nd Qtr. 2013	SDDOT	W BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.32
			Sheet 1 of 1

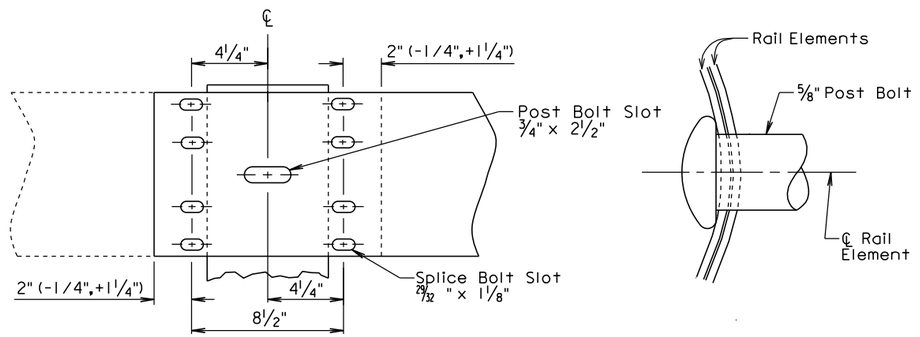


SECTION THROUGH W BEAM RAIL ELEMENT



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

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



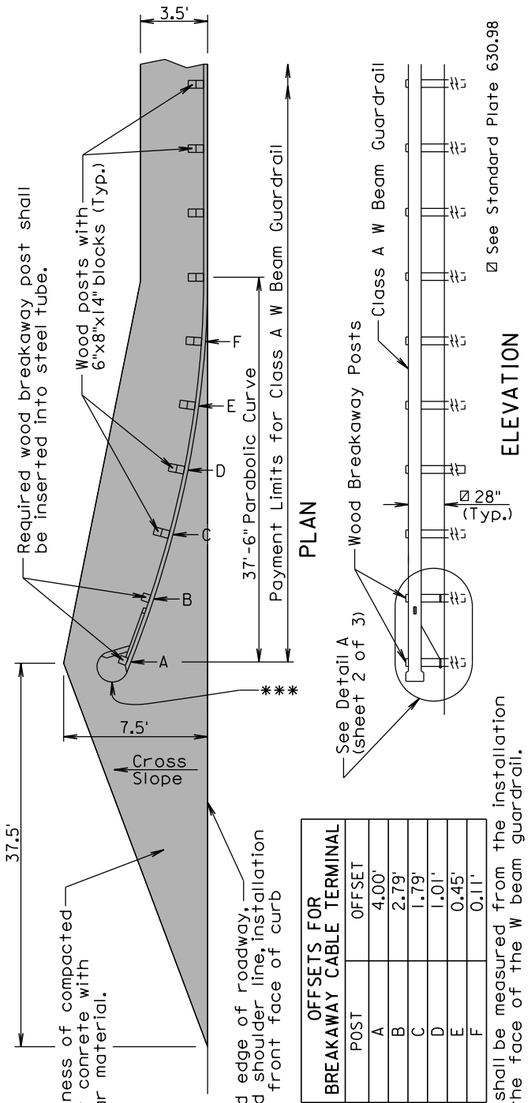
Lap in direction of traffic.

RAIL SPLICE

December 23, 2004

Published Date: 2nd Qtr. 2013	SDDOT	W BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.33
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0901(183)44	38	44



OFFSETS FOR BREAKAWAY CABLE TERMINAL	
POST	OFFSET
A	4.00'
B	2.79'
C	1.79'
D	1.01'
E	0.45'
F	0.11'

Offsets shall be measured from the installation line to the face of the W beam guardrail.

GENERAL NOTES:

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

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

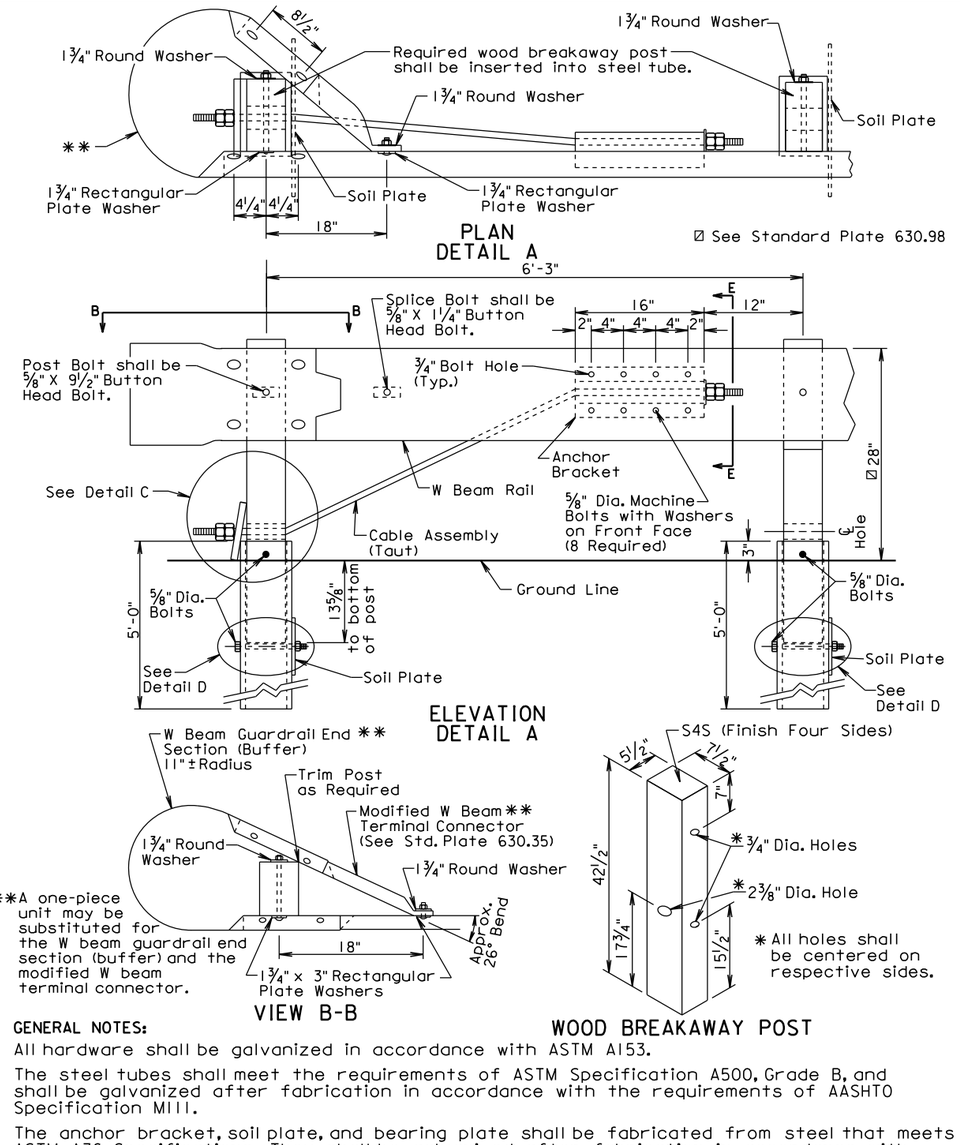
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the SD Standard Specifications for "Base Course". The granular material shall be placed the same thickness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

***An adhesive object marker shall be placed on the end section buffer after placement of the end section buffer. The adhesive object marker dimensions may be 16" x 16" or other variation due to the shape of the end section buffer. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

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

June 26, 2010

Published Date: 2nd Qtr. 2013	SDDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.47 Sheet 1 of 3



GENERAL NOTES:

All hardware shall be galvanized in accordance with ASTM A153.

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

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

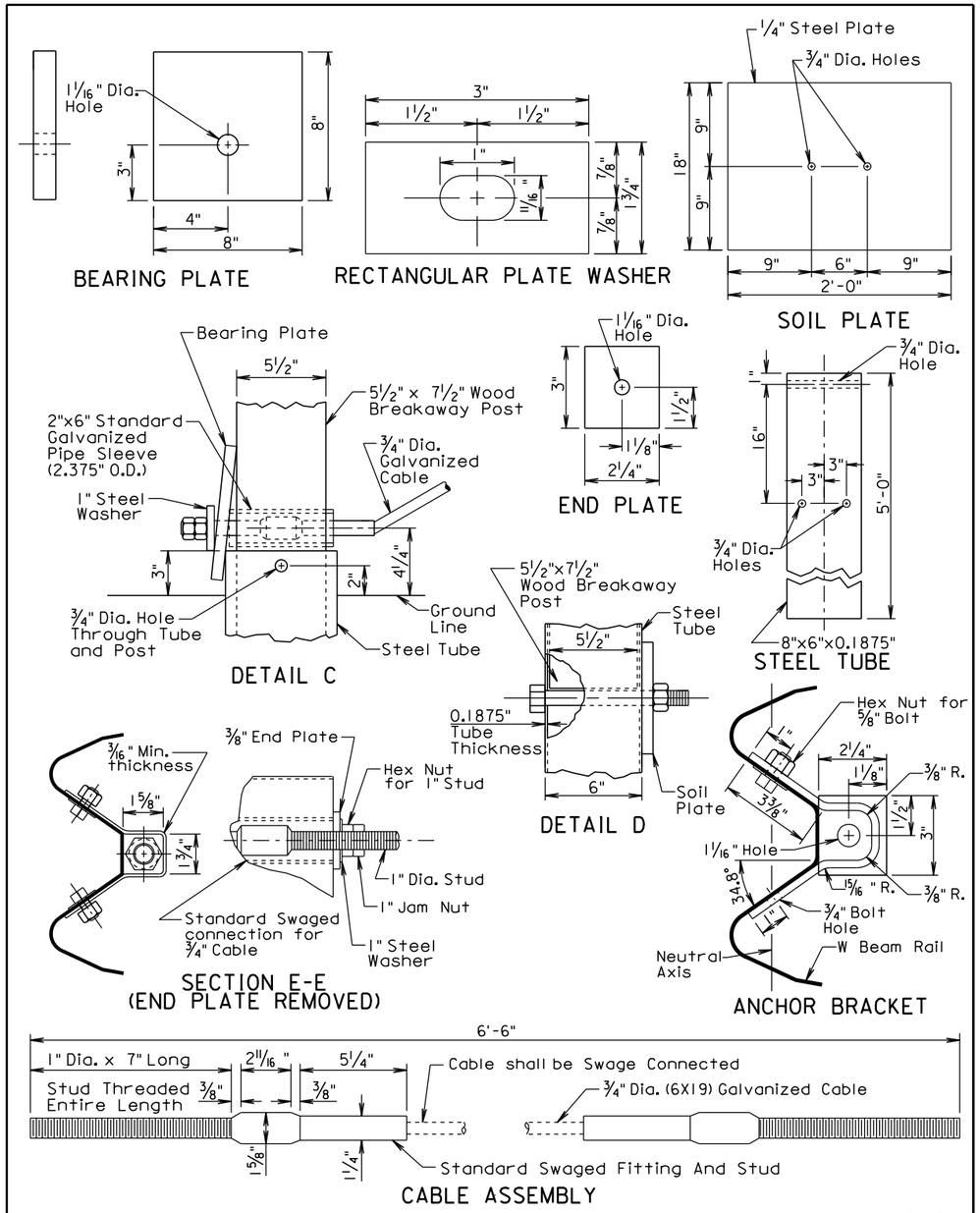
The W Beam End Section (Buffer) shall be 12 gage galvanized steel.

The cable shall be ¾", Type II, with Class A coating in conformance with AASHTO M30.

June 26, 2010

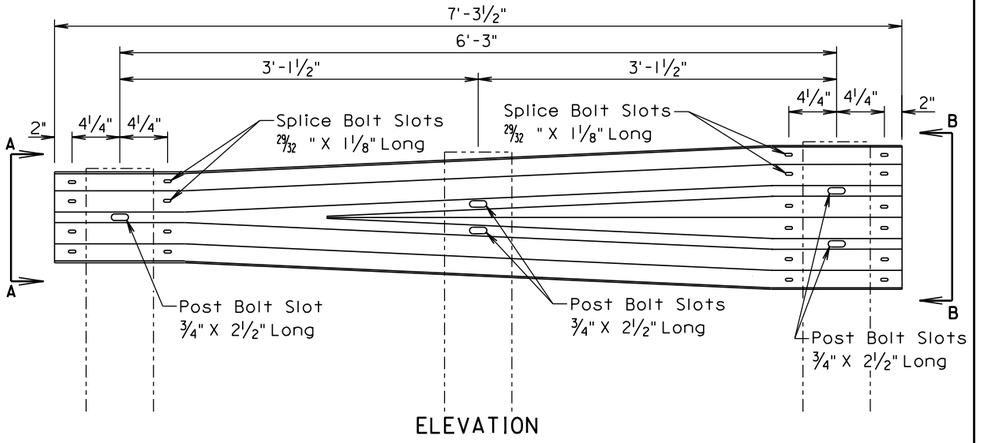
Published Date: 2nd Qtr. 2013	SDDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.47 Sheet 2 of 3

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	IM 0901(183)44	39	44

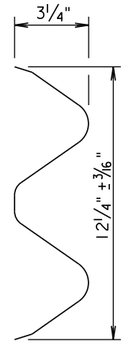


June 26, 2010

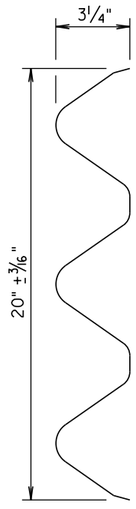
Published Date: 2nd Qtr. 2013	SDDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.47
			Sheet 3 of 3



ELEVATION



VIEW A-A



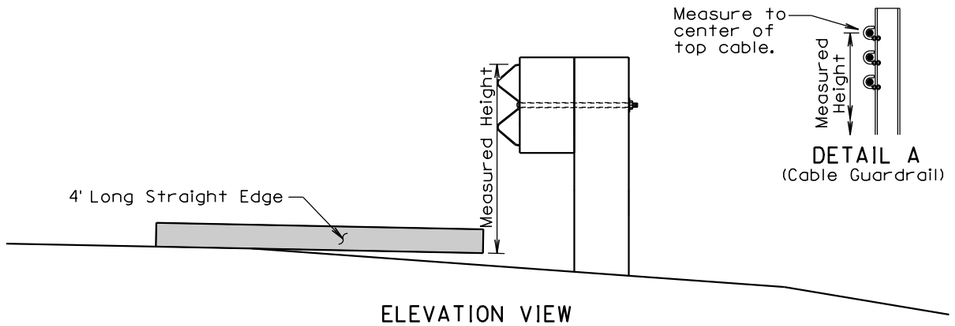
VIEW B-B

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".

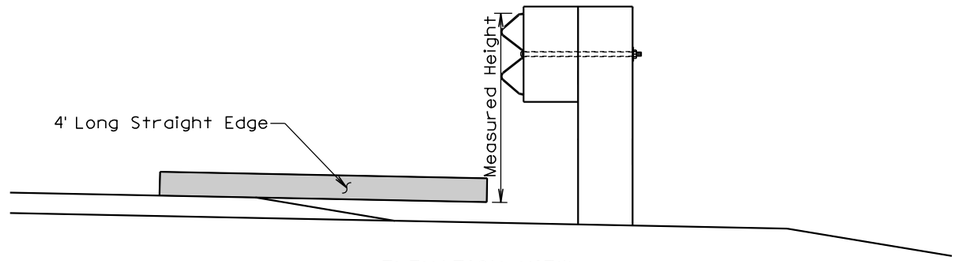
March 31, 2000

Published Date: 2nd Qtr. 2013	SDDOT	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.82 Sheet 1 of 1

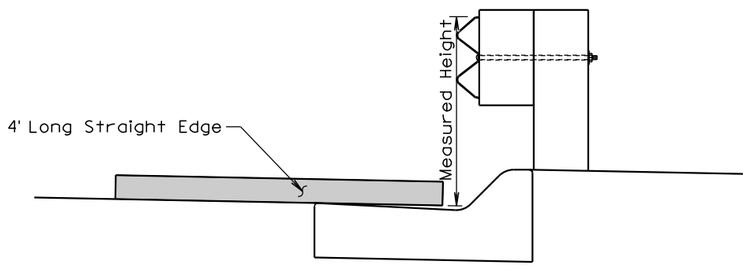


DETAIL A
(Cable Guardrail)

ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)



ELEVATION VIEW
(Guardrail Adjacent to Differential Surfacing Elevations)



ELEVATION VIEW
(Guardrail at Curb and Gutter)

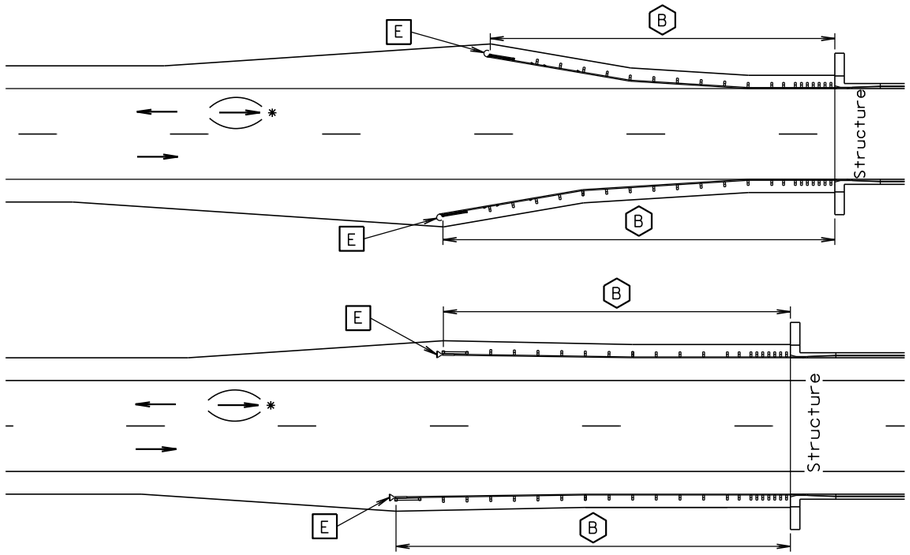
GENERAL NOTES:

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: 2nd Qtr. 2013	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

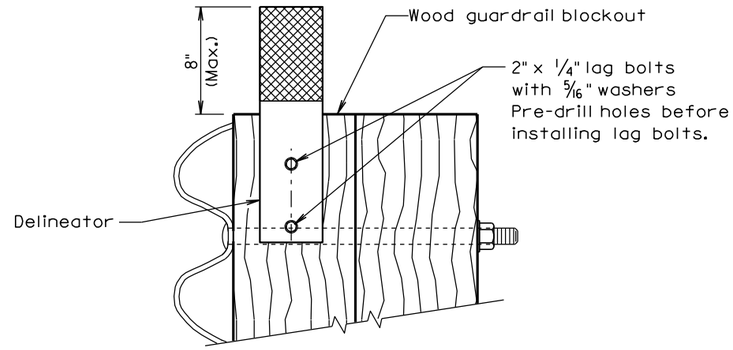
(C) 3 Cable Guardrail Delineation

(M) Type 2 Object Marker

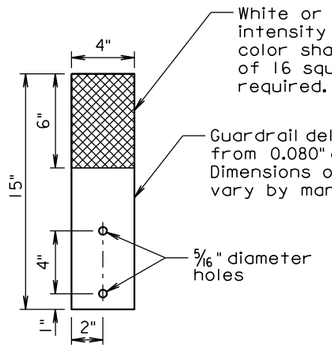
* For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 26, 2011

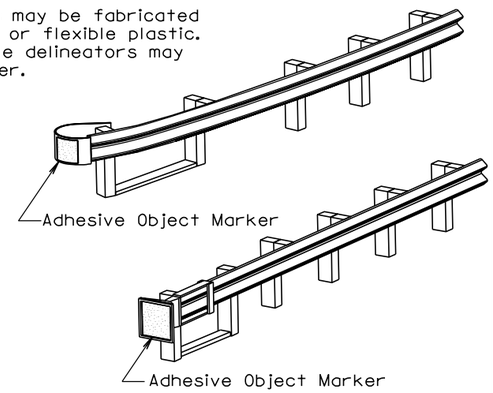
Published Date: 3rd Qtr. 2013	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 1 of 4



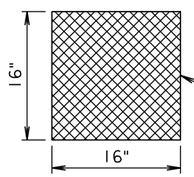
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



[E] GUARDRAIL TERMINAL END OBJECT MARKER

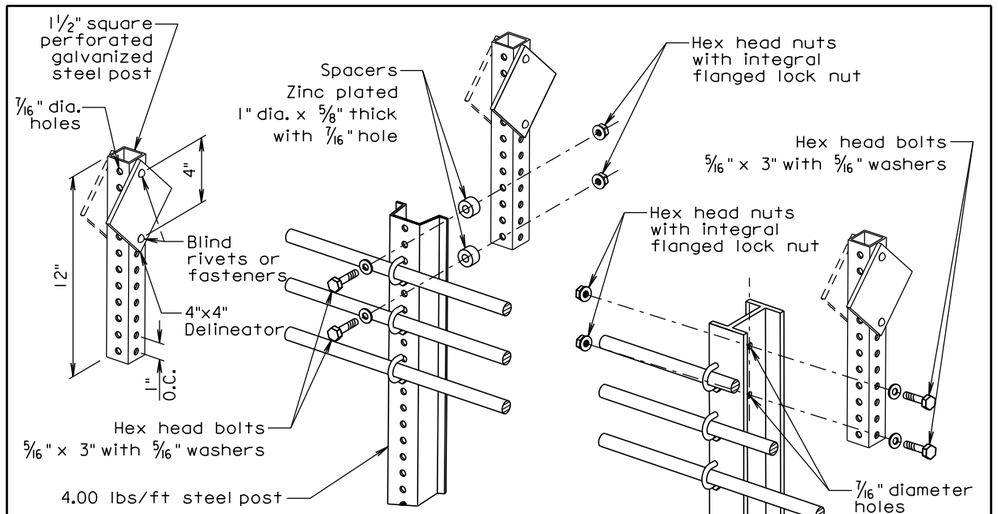


ADHESIVE OBJECT MARKER

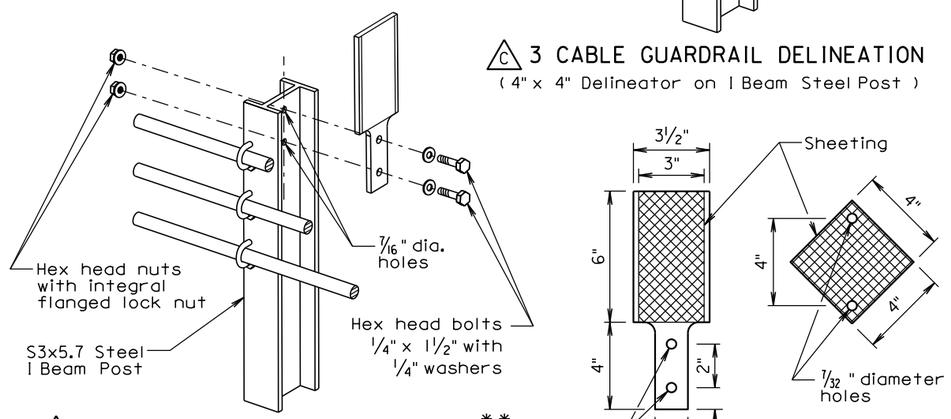
Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting shall be fluorescent yellow super or very high intensity.

June 26, 2011

Published Date: 3rd Qtr. 2013	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 2 of 4



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



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

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

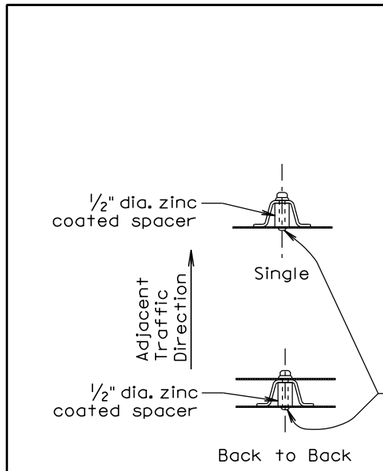
DELINEATORS***
(For 3 Cable Guardrail)

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

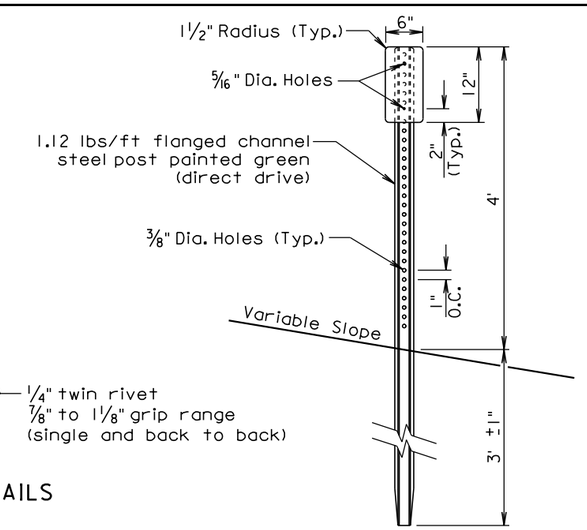
*** Dimensions of flexible delineators may vary by manufacturer. A minimum of 16 square inches of sheeting area is required. The sheeting shall be white or yellow super or very high intensity fluorescent sheeting. The sheeting color shall match the edgeline color.

June 26, 2011

Published Date: 3rd Qtr. 2013	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 3 of 4



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.

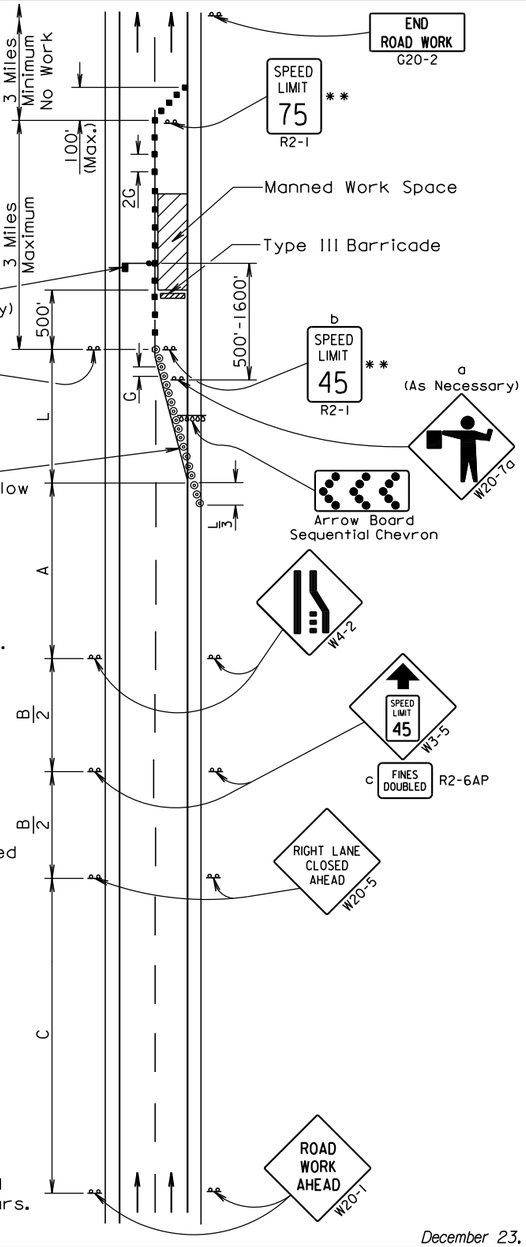
A type 2 object marker shall be placed adjacent to the 3 cable guardrail anchor at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") shall have a fluorescent yellow very high or super high intensity reflective sheeting. All costs for furnishing and installing the 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. 2013	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 4 of 4

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)	Taper Length (Feet) (L)	Spacing of Advanced Warning Signs (Feet) (ABC)
0 - 30	25	180	200
35 - 40	25	320	350
45 - 50	50 *	600	500
55	50 *	660	750
60 - 65	50 *	780	1000
70 - 75	50 *	900	1000 1500 2640

* Spacing to be every 40' for 42" cones.



4" white temporary pavement marking tape for right lane closures and 4" yellow temporary pavement marking tape for left lane closures or temporary road markers at 5' spacing shall be installed when the lane is closed overnight or longer.

Signs a, b, and c shall be removed or covered when workers are not present.

ROAD WORK AHEAD sign is only required in advance of the first lane closure.

The FLAGGER sign shall be used whenever there is a Flagger present.

Left mounted advance signs on undivided highways are not required.

** Speed appropriate for location.

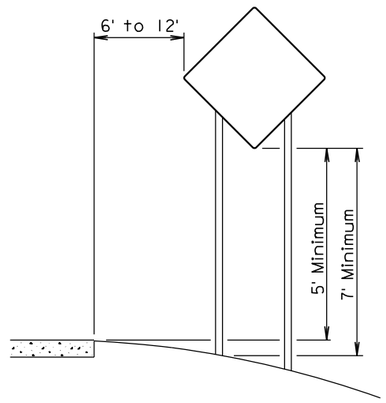
◎ Reflectorized Drum

■ Channelizing Device shall be 42" cones or drums

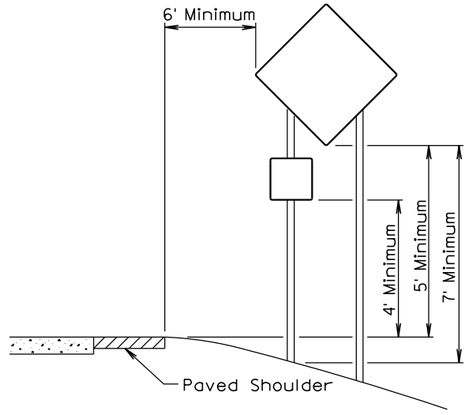
42" cones may be used in place of the drums shown in the taper if setup will not be used during any night time hours.

December 23, 2012

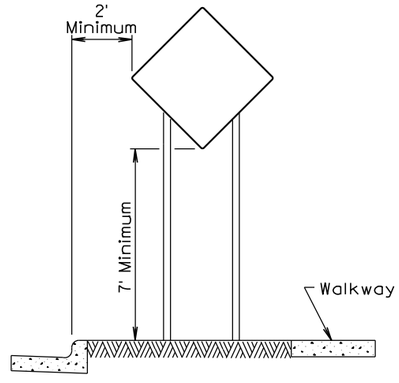
Published Date: 2nd Qtr. 2013	SDDOT	MANNED WORK SPACE SIGNING FOR DIVIDED AND UNDIVIDED HIGHWAYS	PLATE NUMBER 634.63
			Sheet 1 of 1



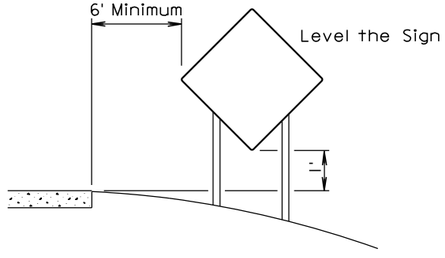
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



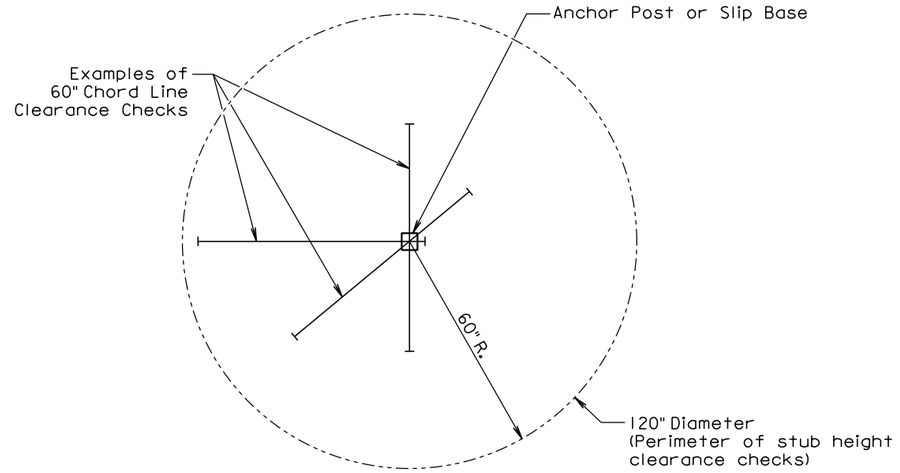
URBAN DISTRICT



RURAL DISTRICT 3 DAY MAXIMUM

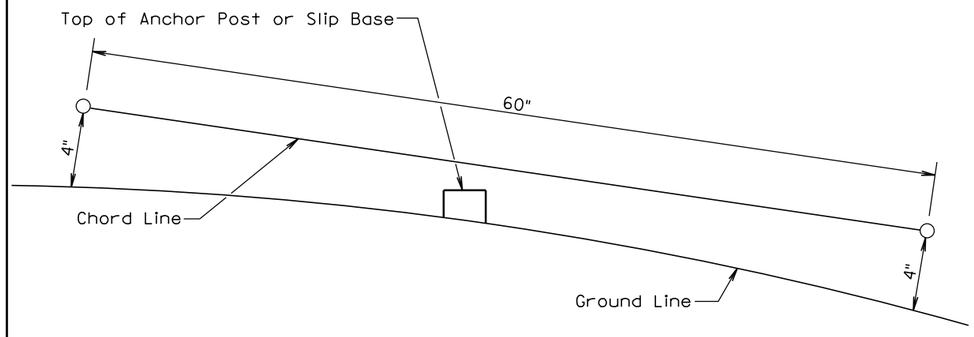
February 14, 2011

Published Date: 2nd Qtr. 2013	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: 2nd Qtr. 2013	**SDDOT**	***BREAKAWAY SUPPORT STUB CLEARANCE***	***PLATE NUMBER*** *634.99*
			Sheet 1 of 1