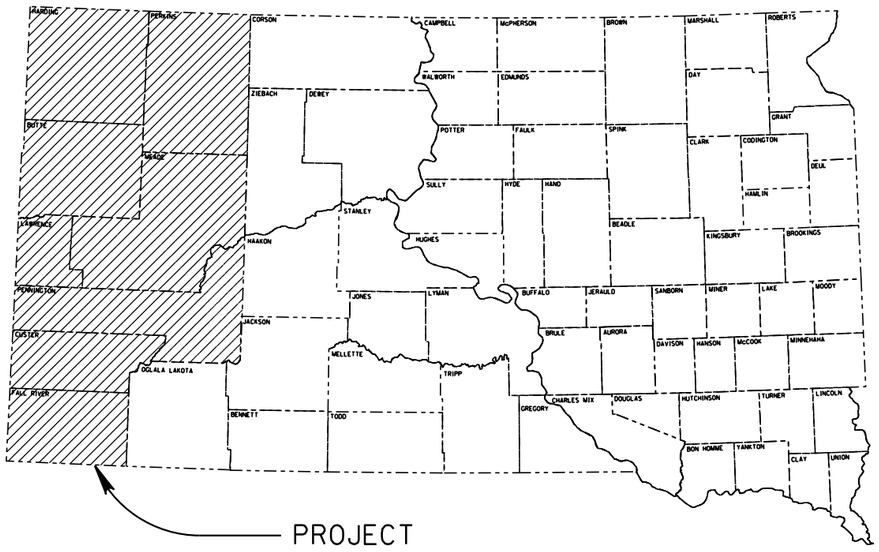


STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECTS 000I–469, 000N–469, & 000P–469 RAPID CITY REGION GUARDRAIL MAINTENANCE

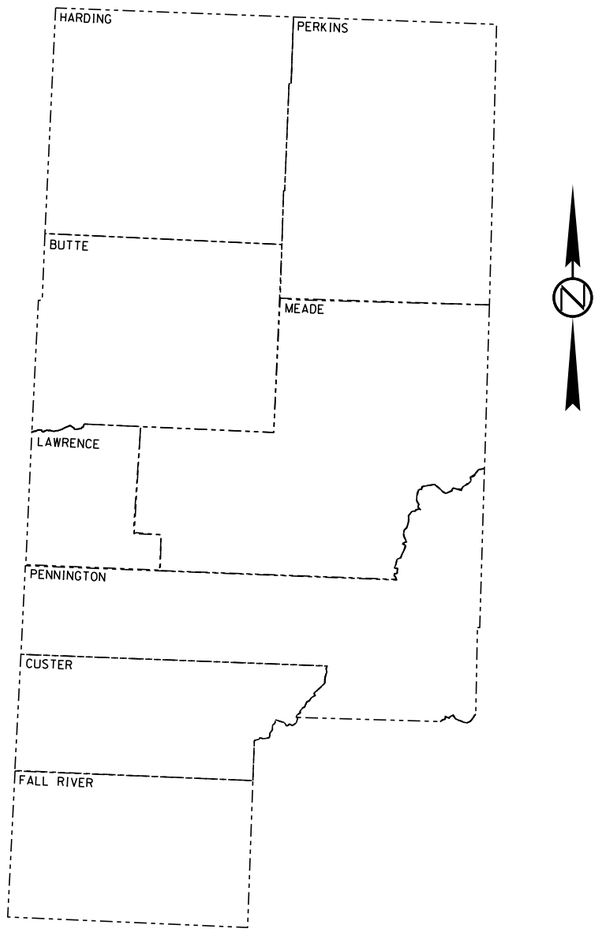
GUARDRAIL REPAIR AT VARIOUS LOCATIONS
ON A DEMAND BASIS

PCNs i5dd, i5de, & i5df

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-469, 000N-469 & 000P-469	1	22

Plotting Date: 06/19/2018

INDEX OF SHEETS



Plot Scale - 1:200

Plotted From - trrc11951

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-469, 000N-469 & 000P-469	2	22

ESTIMATE OF QUANTITIES, 000I-469, PCN i5dd, (Interstate)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0198	Mobilization 2	2	Each
110E0730	Remove Beam Guardrail	100.0	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	1	Each
110E0745	Remove 3 Cable Guardrail Slip Base Anchor Assembly	1	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	1	Each
110E0800	Remove W Beam Guardrail End Terminal	1	Each
629E0100	3 Cable Guardrail	100	Ft
629E0110	NCHRP 350 Test Level 3 High Tension Cable Guardrail	100	Ft
629E0290	NCHRP 350 Test Level 3 High Tension Cable Guardrail Anchor Assembly	1	Each
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	1	Each
629E0400	3 Cable Guardrail Anchor Assembly	2	Each
629E0453	Retension High Tension 3 Cable Guardrail	3,000	Ft
629E0454	Retension High Tension 4 Cable Guardrail	3,000	Ft
629E1000	Repair 3 Cable Guardrail	100	Ft
629E1010	Repair 3 Cable Guardrail Slip Base Anchor Assembly	1	Each
629E1100	3 Cable Guardrail End Post	3	Each
629E1102	3 Cable Guardrail Intermediate Post	10	Each
629E1104	3 Cable Guardrail Post, Winter	15	Each
629E1106	Drive Down 3 Cable Guardrail Post	10	Each
629E1112	Cable Splice	1	Each
629E1114	3 Cable Guardrail J Hook Bolt	100	Each
629E1116	Steel Turnbuckle Cable End Assembly	1	Each
629E1118	Spring Cable End Assembly with Turnbuckle	2	Each
629E1120	W Beam to 3 Cable Transition Bracket	1	Each
629E1122	3 Cable Guardrail End Post Cap	5	Each
629E1143	High Tension 3 Cable Guardrail Post	3	Each
629E1144	High Tension 4 Cable Guardrail Post	3	Each
629E1158	High Tension 3 Cable Guardrail Post and Sleeve	3	Each
629E1159	High Tension 4 Cable Guardrail Post and Sleeve	3	Each
629E1163	High Tension 3 Cable Guardrail Sleeve	3	Each
629E1164	High Tension 4 Cable Guardrail Sleeve	3	Each
629E1170	High Tension Cable Guardrail Terminal Post	1	Each
629E1174	Hardware for High Tension Cable Attachment to Terminal Post	1	Each
629E1175	Hardware for High Tension Cable Attachment to Post	1	Each
629E1180	High Tension Cable Guardrail Post Strap	1	Each
629E1181	High Tension Cable Guardrail Cable Spacer	1	Each
630E0200	Straight Class A Thrie Beam Rail	25.0	Ft
630E1200	Straight Class A W Beam Rail	75.0	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	1	Each
630E2015	W Beam Guardrail Flared End Terminal	1	Each
630E2020	W Beam Guardrail Tangent End Terminal	1	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	1	Each
630E2110	Beam Guardrail Post and Block	10	Each
630E2120	Beam Guardrail Post and Block, Winter	5	Each
634E0010	Flagging	200.0	Hour
634E0125	Traffic Control for Guardrail Repair	2	Site
634E0420	Type C Advance Warning Arrow Panel	1	Each

ESTIMATE OF QUANTITIES, 000N-469, PCN i5de, (Non-Priority)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0197	Mobilization 1	2	Each
009E0198	Mobilization 2	2	Each
009E0199	Mobilization 3	2	Each
110E0730	Remove Beam Guardrail	100.0	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	1	Each
110E0745	Remove 3 Cable Guardrail Slip Base Anchor Assembly	1	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	1	Each
110E0800	Remove W Beam Guardrail End Terminal	1	Each
629E0100	3 Cable Guardrail	100	Ft
629E0110	NCHRP 350 Test Level 3 High Tension Cable Guardrail	100	Ft
629E0290	NCHRP 350 Test Level 3 High Tension Cable Guardrail Anchor Assembly	1	Each
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	1	Each
629E0400	3 Cable Guardrail Anchor Assembly	2	Each
629E0453	Retension High Tension 3 Cable Guardrail	3,000	Ft
629E0454	Retension High Tension 4 Cable Guardrail	3,000	Ft
629E1000	Repair 3 Cable Guardrail	100	Ft
629E1010	Repair 3 Cable Guardrail Slip Base Anchor Assembly	1	Each
629E1100	3 Cable Guardrail End Post	3	Each
629E1102	3 Cable Guardrail Intermediate Post	10	Each
629E1104	3 Cable Guardrail Post, Winter	15	Each
629E1106	Drive Down 3 Cable Guardrail Post	10	Each
629E1112	Cable Splice	1	Each
629E1114	3 Cable Guardrail J Hook Bolt	100	Each
629E1116	Steel Turnbuckle Cable End Assembly	1	Each
629E1118	Spring Cable End Assembly with Turnbuckle	2	Each
629E1120	W Beam to 3 Cable Transition Bracket	1	Each
629E1122	3 Cable Guardrail End Post Cap	5	Each
629E1143	High Tension 3 Cable Guardrail Post	3	Each
629E1144	High Tension 4 Cable Guardrail Post	3	Each
629E1158	High Tension 3 Cable Guardrail Post and Sleeve	3	Each
629E1159	High Tension 4 Cable Guardrail Post and Sleeve	3	Each
629E1163	High Tension 3 Cable Guardrail Sleeve	3	Each
629E1164	High Tension 4 Cable Guardrail Sleeve	3	Each
629E1170	High Tension Cable Guardrail Terminal Post	1	Each
629E1174	Hardware for High Tension Cable Attachment to Terminal Post	1	Each
629E1175	Hardware for High Tension Cable Attachment to Post	1	Each
629E1180	High Tension Cable Guardrail Post Strap	1	Each
629E1181	High Tension Cable Guardrail Cable Spacer	1	Each
630E0200	Straight Class A Thrie Beam Rail	25.0	Ft
630E1200	Straight Class A W Beam Rail	75.0	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	1	Each
630E2015	W Beam Guardrail Flared End Terminal	1	Each
630E2020	W Beam Guardrail Tangent End Terminal	1	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	1	Each
630E2110	Beam Guardrail Post and Block	10	Each
630E2120	Beam Guardrail Post and Block, Winter	5	Each
634E0010	Flagging	200.0	Hour
634E0125	Traffic Control for Guardrail Repair	2	Site
634E0420	Type C Advance Warning Arrow Panel	1	Each

ESTIMATE OF QUANTITIES, 000P-469, PCN i5df, (Priority)

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0197	Mobilization 1	2	Each
009E0198	Mobilization 2	2	Each
009E0199	Mobilization 3	2	Each
110E0730	Remove Beam Guardrail	100.0	Ft
110E0740	Remove 3 Cable Guardrail Anchor Assembly	1	Each
110E0745	Remove 3 Cable Guardrail Slip Base Anchor Assembly	1	Each
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	1	Each
110E0800	Remove W Beam Guardrail End Terminal	1	Each
629E0100	3 Cable Guardrail	100	Ft
629E0110	NCHRP 350 Test Level 3 High Tension Cable Guardrail	100	Ft
629E0290	NCHRP 350 Test Level 3 High Tension Cable Guardrail Anchor Assembly	1	Each
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	1	Each
629E0400	3 Cable Guardrail Anchor Assembly	2	Each
629E0453	Retension High Tension 3 Cable Guardrail	3,000	Ft
629E0454	Retension High Tension 4 Cable Guardrail	3,000	Ft
629E1000	Repair 3 Cable Guardrail	100	Ft
629E1010	Repair 3 Cable Guardrail Slip Base Anchor Assembly	1	Each
629E1100	3 Cable Guardrail End Post	3	Each
629E1102	3 Cable Guardrail Intermediate Post	10	Each
629E1104	3 Cable Guardrail Post, Winter	15	Each
629E1106	Drive Down 3 Cable Guardrail Post	10	Each
629E1112	Cable Splice	1	Each
629E1114	3 Cable Guardrail J Hook Bolt	100	Each
629E1116	Steel Turnbuckle Cable End Assembly	1	Each
629E1118	Spring Cable End Assembly with Turnbuckle	2	Each
629E1120	W Beam to 3 Cable Transition Bracket	1	Each
629E1122	3 Cable Guardrail End Post Cap	5	Each
629E1143	High Tension 3 Cable Guardrail Post	3	Each
629E1144	High Tension 4 Cable Guardrail Post	3	Each
629E1158	High Tension 3 Cable Guardrail Post and Sleeve	3	Each
629E1159	High Tension 4 Cable Guardrail Post and Sleeve	3	Each
629E1163	High Tension 3 Cable Guardrail Sleeve	3	Each
629E1164	High Tension 4 Cable Guardrail Sleeve	3	Each
629E1170	High Tension Cable Guardrail Terminal Post	1	Each
629E1174	Hardware for High Tension Cable Attachment to Terminal Post	1	Each
629E1175	Hardware for High Tension Cable Attachment to Post	1	Each
629E1180	High Tension Cable Guardrail Post Strap	1	Each
629E1181	High Tension Cable Guardrail Cable Spacer	1	Each
630E0200	Straight Class A Thrie Beam Rail	25.0	Ft
630E1200	Straight Class A W Beam Rail	75.0	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	1	Each
630E2015	W Beam Guardrail Flared End Terminal	1	Each
630E2020	W Beam Guardrail Tangent End Terminal	1	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	1	Each
630E2110	Beam Guardrail Post and Block	10	Each
630E2120	Beam Guardrail Post and Block, Winter	5	Each
634E0010	Flagging	200.0	Hour
634E0125	Traffic Control for Guardrail Repair	2	Site
634E0420	Type C Advance Warning Arrow Panel	1	Each

SPECIFICATIONS

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

CONTRACT TIME PROVISIONS

At such time as repairs are required, the Contractor will be notified. The Contractor will have 7 calendar days to complete the repairs.

WORK DESCRIPTION

Repair of guardrail at various locations in the Rapid City Region on a demand basis.

UTILITIES

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

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

MOBILIZATION

If more than one location within an area is to be repaired, the Contractor will be compensated for only one mobilization per area.

Mobilization 1 is the cost of mobilization per each time the Contractor is called in by the Belle Fourche Area Engineer, or his designated representative, to perform guardrail repair within the Belle Fourche Area.

Mobilization 2 is the cost of mobilization per each time the Contractor is called in by the Rapid City Area Engineer, or his designated representative, to perform guardrail repair within the Rapid City Area.

Mobilization 3 is the cost of mobilization per each time the Contractor is called in by the Custer Area Engineer, or his designated representative, to perform guardrail repair within the Custer Area

Mobilization will be paid once each time the Contractor is called to repair guardrail, regardless of the number of sites requiring repair within the project limits.

Guardrail repairs will be limited to all Interstate and State highways within the boundaries of the Rapid City Region. Maintenance maps for priority and non-priority routes are available at the Rapid City Region office.

TRAFFIC CONTROL

The bid item “Traffic Control for Guardrail Repair” shall include all necessary traffic control devices as required by these plans and shall be measured and paid and the contract unit price per “site”. The Contractor shall be compensated each time they are required to mobilize to a “site” for guardrail repair. If the Contractor relocates the traffic control devices to a different location during the same mobilization, additional compensation will not be made and it shall be considered the same “site”.

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

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

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

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

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

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

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

Traffic shall be returned to the normal driving lanes during non-working hours.

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

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.

RESTORATION OF DISTURBED AREAS

Areas disturbed as a result of the work necessary to repair guardrail shall be reshaped and/or restored to the satisfaction of the Engineer. The disturbed areas shall be tilled to a minimum depth of three inches and seeded with the following seed mix rate:

Type F Permanent Seed Mixture shall consist of the following:

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

All costs for reshaping, leveling, tilling, and seeding disturbed areas shall be incidental to the various bid items on the project.

GUARDRAIL

Retension High Tension3 Cable Guardrail shall include all costs to adjust the tension in a length of 3 Cable Guardrail. Measurement for payment will be per foot for all runs of 3 Cable Guardrail and shall include all 3 cables and both anchor ends that make up a run of 3 Cable Guardrail. Retension 3 Cable Guardrail may include cutting and shortening of cables at the anchors to allow for the proper tensioning. Payment will be center of anchor to center of anchor.

Retension High Tension 4 Cable Guardrail shall include all costs to adjust the tension in a length of High Tension 4 Cable Guardrail to manufacturers specifications. Measurement for payment shall be from center of anchor to center of anchor and shall include all 4 cables that make up a run of High Tension 4 Cable Guardrail. Retension High Tension 4 Cable Guardrail shall include cutting and shortening of
cables at the anchors to allow for the proper tensioning.

Repair 3 Cable Guardrail Slip Base Anchor Assembly shall include full compensation for repair of the damaged Slip Base Anchor Assembly. This work will be performed if it is determined that the Slip Base Anchor Assembly can be repaired without total footing removal. The work will consist of coring a 12” diameter section into the existing footing, centered over the existing slip base anchor stub post, to a depth of 22”. The core will then be broke off and disposed of. The sides of the hole in the footing shall be roughened to the satisfaction of the Engineer. A rapid-setting, non-shrink, non-metallic grout shall be used (in accordance with the manufacturer’s recommendations) to anchor the new slip base anchor stub post in the footing. The grout shall reach a compressive strength of over 5000 PSI.

3 Cable Guardrail End Post shall include all costs for removal of damaged end post and installation of 3 cable guardrail end post. 3 Cable Guardrail End Post shall also include a new end post cap. All costs incurred for removal and replacement of the existing cable on the new post shall be incidental to this contract item.

3 Cable Guardrail Intermediate Post shall include all costs for removal of damaged post and installation of 3 cable guardrail intermediate line post. All costs incurred for removal and replacement of the existing cable on the new post, including J Hook Bolts shall be incidental to this contract item.

3 Cable Guardrail Slip Base Anchor Post shall include all costs for removal of damaged post and installation of 3 cable guardrail slip base anchor post. All costs incurred for removal and replacement of the existing cable on the new post, shall be incidental to this contract item.

3 Cable Guardrail Post, Winter shall include all costs for removal of the damaged post and installation of cable guardrail post when there is in excess of one foot of frozen ground at the work site. When this condition exists, the contract unit price per each for “3 Cable Guardrail Post, Winter” will be the pay unit rather than the contract unit price per each for "3 Cable Guardrail Intermediate Post" and/or "3 Cable Guardrail End Post". The Contractor shall furnish any J Hook Bolts needed as shown on Standard Plate 629.01 (5 of 6). All costs incurred for removal and replacement of the existing cable on the new post, including J Hook Bolts shall be incidental to this contract item.

Drive Down 3 Cable Guardrail Post shall include all costs for adjusting the height of a Cable Rail Post. All costs to disassemble the cable rail to do this work shall be incidental to this contract item.

Reset 3 Cable Guardrail Post shall include all costs incurred for the realignment and/or removal and resetting of a cable guardrail post to properly align cable guardrail section. The Contractor shall furnish any J Hook Bolts needed as shown on Standard Plate 629.01 (5 of 6). Work under this item may require straightening of in place bent cable guardrail posts to bring them into alignment with cable guardrail section. Payment for “Reset 3 Cable Guardrail Post” will be the same whether in frozen or unfrozen ground. All costs incurred for removal and replacement of the existing cable on the new post shall be incidental to this item.

Cable Anchor Bracket shall include furnishing and installing the Cable Anchor Bracket as shown on Standard Plate 629.01 (3 of 6).

Cable Splice shall include all costs incurred for cutting existing cable and for furnishing and installing the necessary cable splice. This contract item shall be used for low tension and high tension cable guardrail.

3 Cable Guardrail J Hook Bolt shall include furnishing & installing J hook bolts when no other work is required to the 3 cable guardrail other than missing or broken J hook bolts.

Steel Turnbuckle Cable End Assembly shall include all costs for furnishing and installing the Steel Turnbuckle Cable End Assembly as shown on Standard Plate 629.01 (4 of 6).

Turnbuckle Assembly shall include all costs for furnishing and installing the Turnbuckle Assembly on high tension cable guardrail.

Spring Cable End Assembly with Turnbuckle shall include all costs for furnishing and installing the Spring Cable End Assembly with Turnbuckle as shown on Standard Plate 629.01 (4 of 6).

W Beam to 3 Cable Transition Bracket shall include all costs incurred for removing the damaged transition bracket and installing a transition bracket in accordance with the details on Standard Plates 629.05 & 629.15.

3 Cable Guardrail End Post Cap shall include all costs for furnishing and installing an end post cap as shown on Standard Plate 629.01 (6 of 6).

High Tension 4 Cable Guardrail Post: High Tension 4 Cable Guardrail Post shall include all costs for removal of damaged post and installation of a High Tension 4 Cable Guardrail Post. All costs incurred for removal and replacement of the existing cable on the new post, including hardware shall be incidental to this contract item.

High Tension 4 Cable Guardrail Post and Sleeve shall include all costs for removal of damaged post and sleeve, and installation of a High Tension 4 Cable Guardrail Post and Sleeve. All costs incurred for removal and replacement of
the existing cable on the new post, including hardware shall be incidental to this contract item.

High Tension 4 Cable Guardrail Sleeve shall include all costs for removal of damaged sleeve and installation of a High Tension 4 Cable Guardrail Sleeve. All costs incurred for removal and replacement of the existing post and of the existing cable on the post, including hardware shall be incidental to this contract item.

High Tension Cable Guardrail Terminal Post shall include all costs for removal of damaged terminal post and installation of a High Tension Cable Guardrail Terminal Post. All costs incurred for removal and replacement of the existing cable on the new post, including reflective sheeting, hardware and tensioning cable shall be incidental to this contract item.

Hardware For High Tension Cable Attachment To Terminal Post shall be used for furnishing and installing the hardware for a high tension cable guardrail terminal post. This item is used for a typical repair if a high tension cable guardrail terminal post is struck and releases the cable(s). Use this item when the terminal post is in good condition and only new hardware and resetting the terminal post is necessary. Payment includes cost for furnishing and installing hardware for the high tension cable attachment to terminal post, resetting terminal post, labor, equipment, and incidentals.

Hardware For High Tension Cable Attachment To Post shall be used for furnishing and installing the hardware for a high tension cable attachment to post. This item is used for a typical repair if the hardware was damaged by a snow plow or other crash. Use this item when the post is in good condition and only new hardware is necessary. The quantity and unit for the bid item is one “Each” for one attachment, i.e. if several attachments are damaged on a high tension 4 cable guardrail post then the quantity would be more than 1. Payment includes cost for furnishing and installing hardware for the high tension cable attachment to post, labor, equipment, and incidentals.

High Tension Cable Guardrail Cable Strap shall include all costs for removal of damaged/missing strap and installation of a High Tension Cable Guardrail Cable Strap. High Tension Cable Guardrail Cable Strap contract item will not be paid for when a new guardrail post is paid for as the new guardrail post shall include the strap. This item is specific to products from Trinity known as the CASS high tension cable barrier.

High Tension Cable Guardrail Cable Spacer shall include all costs for removal of damaged spacer and installation of a High Tension Cable Guardrail Cable Spacer. High Tension Cable Guardrail Cable Spacer contract item will not be paid for when a new guardrail post is paid for as the new guardrail post shall include the spacer. This item is specific to products from Trinity known as the CASS high tension cable barrier.

Straight Class A Thrie Beam Rail shall include all costs for removing damaged Thrie Beam rail and replacing with Class A Thrie Beam rail.

Straight Class A W Beam Rail shall include all costs for removing damaged W Beam rail and replacing with Class A W Beam rail.

Straight Class B W Beam Rail shall include all costs for removing damaged W Beam rail and replacing with Class B W Beam rail.

W Beam to Thrie Beam Guardrail Transition shall include all costs for removing damaged rail and replacing with a W Beam to Thrie Beam Guardrail Transition.

Asymmetrical W Beam to Thrie Beam Guardrail Transition shall include all costs for removing damaged rail and replacing with a Asymmetrical W Beam to Thrie Beam Guardrail Transition.

W Beam Guardrail Flared End Terminal shall include all costs incurred for furnishing and installing an approved flared end terminal in accordance with details on Standard Plate 630.87. At some locations of W Beam Guardrail Flared End Terminal damage, the Area Engineer may decide to replace the existing W Beam Guardrail Flared End Terminal in lieu of replacing the various components of the W Beam Guardrail Flared End Terminal.

The W Beam Guardrail Flared End Terminal shall be on the approved products list: http://apps.sd.gov/HC60ApprovedProducts/main.aspx

The contract unit price per each for “W Beam Guardrail Flared End Terminal” shall include all costs incurred for furnishing and installing one (1) end section as shown on Standard Plate 630.87 including removal of the existing end terminal.

W Beam Guardrail Tangent End Terminal shall include all costs incurred for furnishing and installing an approved tangent end terminal in accordance with details on Standard Plate 630.88. At some locations of W Beam Guardrail Tangent End Terminal damage, the Area Engineer may decide to replace the existing W Beam Guardrail Tangent End Terminal in lieu of replacing the various components of the W Beam Guardrail Tangent End Terminal.

The W Beam Guardrail Tangent End Terminal shall be on the approved products list: http://apps.sd.gov/HC60ApprovedProducts/main.aspx

The contract unit price per each for “W Beam Guardrail Tangent End Terminal” shall include all costs incurred for furnishing and installing one (1) end section as shown on Standard Plate 630.88 including removal of the existing end terminal.

Beam Guardrail Block shall include all costs for removing the broken block and installing a block.

Beam Guardrail Post & Block shall include all costs for removing the broken post and installing a post and block. Beam Guardrail Post & Block shall include replacement of post and blocks located within the limits of the Tangent and Flared End Terminals.

Beam Guardrail Post & Block, Winter shall include all costs incurred for replacement of a steel beam guardrail post when there is in excess of one foot of frozen ground at the work site. When this condition exists, the contract unit price per each for “Beam Guardrail Post & Block, Winter” will be the pay unit rather than the contract unit price per each for “Beam Guardrail Post & Block". Beam Guardrail Post & Block, Winter shall include replacement of post and blocks located within the limits of the Tangent and Flared End Terminals.

End Terminal Wood Breakaway Post shall include all costs incurred for removal of a broken wood end post and installing a replacement wood end post in a steel tube sleeve. This contract item shall include replacement of wood posts on various end terminals including Breakaway Cable Terminals (BCT), Trailing End Terminals, Tangent End Terminals and Flared End Terminals. The Contractor shall be responsible for making sure the wood post matches the appropriate Standard Plate or end terminal manufacturer’s requirements.

End Terminal Hinged Breakaway Post shall include all costs incurred for removal of a hinged breakaway end post and installing a replacement hinged post on a post bottom base. This contract item shall include replacement of hinged breakaway posts on various end terminals including Tangent End Terminals and Flared End Terminals. The Contractor shall be responsible for making sure the hinged breakaway post match the end terminal manufacturer’s requirements.

Breakaway Cable Terminal (B.C.T) End Rail shall include all costs incurred for removing the 12.5 ft. or 25 ft section of damaged B.C.T. W beam adjacent to the Radius Terminal Element and replacing with new guardrail. The Contractor shall field drill holes in the guardrail for installation.

W-Beam Guardrail End Section Buffer shall include all costs incurred for installing a buffer assembly. Removal of the existing end section buffer shall be incidental to this contract item.

Tangent End Terminal Extruder Head shall include all costs incurred for removing the damaged extruder head and installing a new extruder head on the Tangent End Terminal.

Tangent End Terminal Rail shall include all costs incurred for removing 12.5 ft. or 25 ft. section(s) of damaged beam guardrail and replacing new beam guardrail on the Tangent End Terminal.

Rubrail shall include all costs to install rubrail. The Contractor shall provide the necessary wood blocks and bolts to attach the rubrail to the wood posts.

Drive Down Beam Guardrail Post: Drive Down Beam Guardrail Post shall include all costs for adjusting the height of a steel beam guardrail post. All costs to disassemble the steel beam guardrail shall be incidental to this contract item.

Reset Beam Guardrail Post & Block shall include all costs for removing and resetting post to properly align the steel beam section. Payment for “Reset Beam Guardrail Post & Block” shall be the same in frozen or unfrozen ground.

HIGH TENSION CABLE GUARDRAIL

The Contractor shall furnish and install a 3 or 4 cable high tension guardrail system that meets the Test Level 3 crash testing requirements of National Cooperative Highway Research Program (NCHRP) 350 or current Manual for Assessing Safety Hardware (MASH). The maximum dynamic deflection of the system shall be less than 8 feet and the maximum post spacing shall be 16 feet unless specified otherwise in the plans.

The high tension cable guardrail system shall be in compliance with Specifications Section 6.9 Buy America.

The Contractor shall install the system according to the manufacturer’s installation recommendations except where stated otherwise in the plans. A copy of the detail drawings and installation instructions for the high tension cable guardrail and anchor assemblies shall be given to the Engineer a minimum of 4 weeks prior to installation of the high tension cable guardrail system.

All posts shall be galvanized and inserted into driven galvanized steel sleeves with soil plates.

The cables provided shall be pre-stretched in the factory.

The Contractor shall check and adjust the tension of the cables a minimum of 3 weeks after installation and not longer than 6 weeks after installation. Cost for this work shall be incidental to the contract unit price per foot for “NCHRP 350 Test Level 3 High Tension Cable Guardrail”.

The Contractor shall provide a signed letter of compliance to the Engineer upon completion of the high tension cable guardrail installation(s) stating that the high tension cable barrier system has been installed in conformance to the installation instructions, specifications, and at a minimum meets the Test Level 3 crash test requirements of NCHRP 350 or MASH.

The high tension cable guardrail shall be measured along the centerline of the cable guardrail from center of anchor assembly to center of anchor assembly to the nearest foot. Example: If the system utilizes 4 anchor footings in the anchor assembly, then the center of the anchor assembly would be centered between the 2nd and 3rd footing.

All costs for furnishing and installing the 3 or 4 cable high tension guardrail system including all labor, materials, and equipment shall be incidental to the contract unit price per foot for “NCHRP 350 Test Level 3 High Tension Cable Guardrail”.

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.

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

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

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

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

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

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

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

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

POST SPACING FOR HORIZONTAL CURVES	
Roadway ℄ Curvature	Maximum Post Spacing (Ft)
1° and Less	16'
Greater than 1° to 8°	12'
Greater than 8° to 13°	8'
Greater than 13°	NOT ALLOWED

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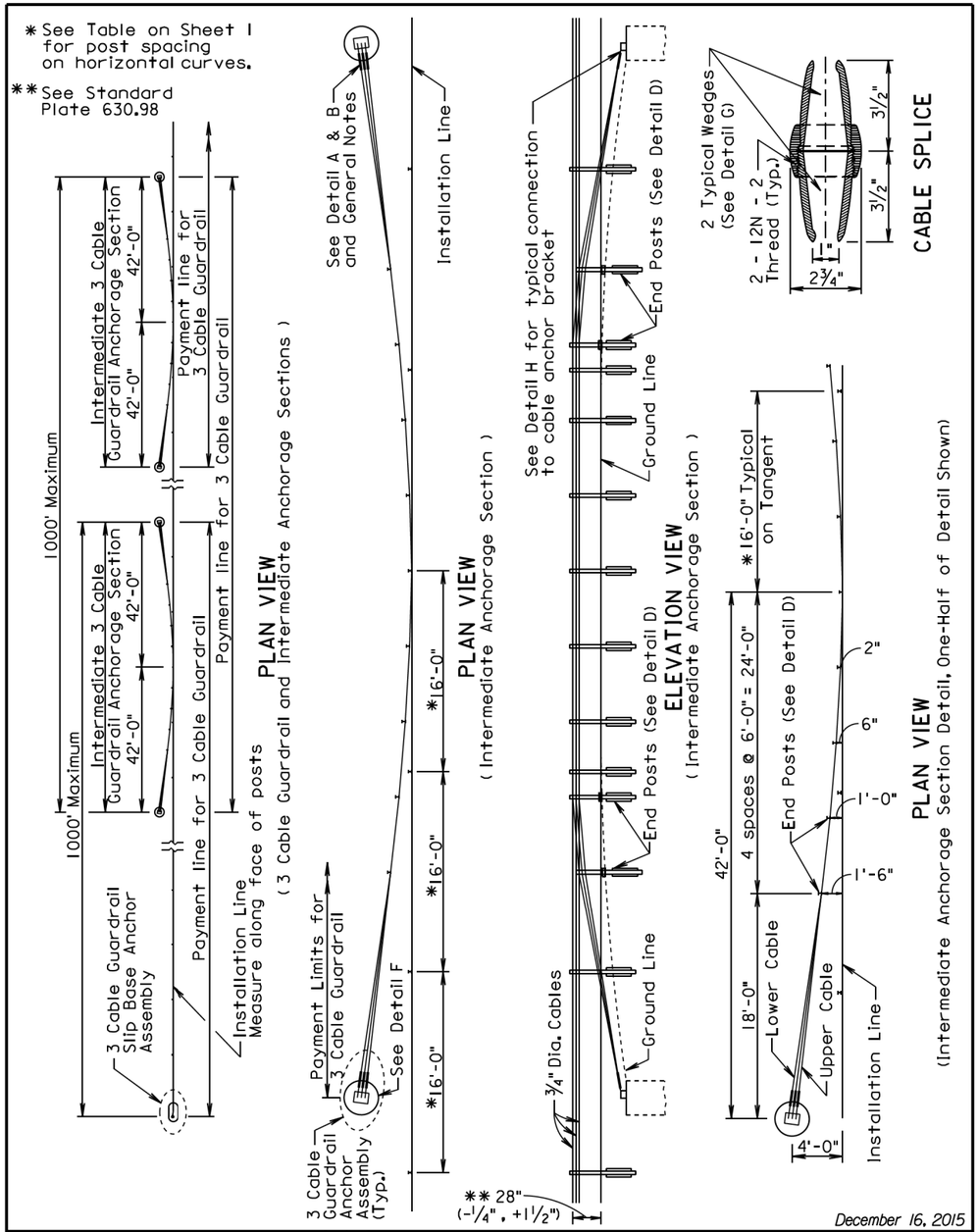
Published Date: 2nd Qtr. 2018	SDDOT	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER 629.01 Sheet 1 of 6



December 16, 2015

Published Date: 2nd Qtr. 2018	SDDOT	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER 629.01 Sheet 2 of 6

Published Date: 2nd Qtr. 2018

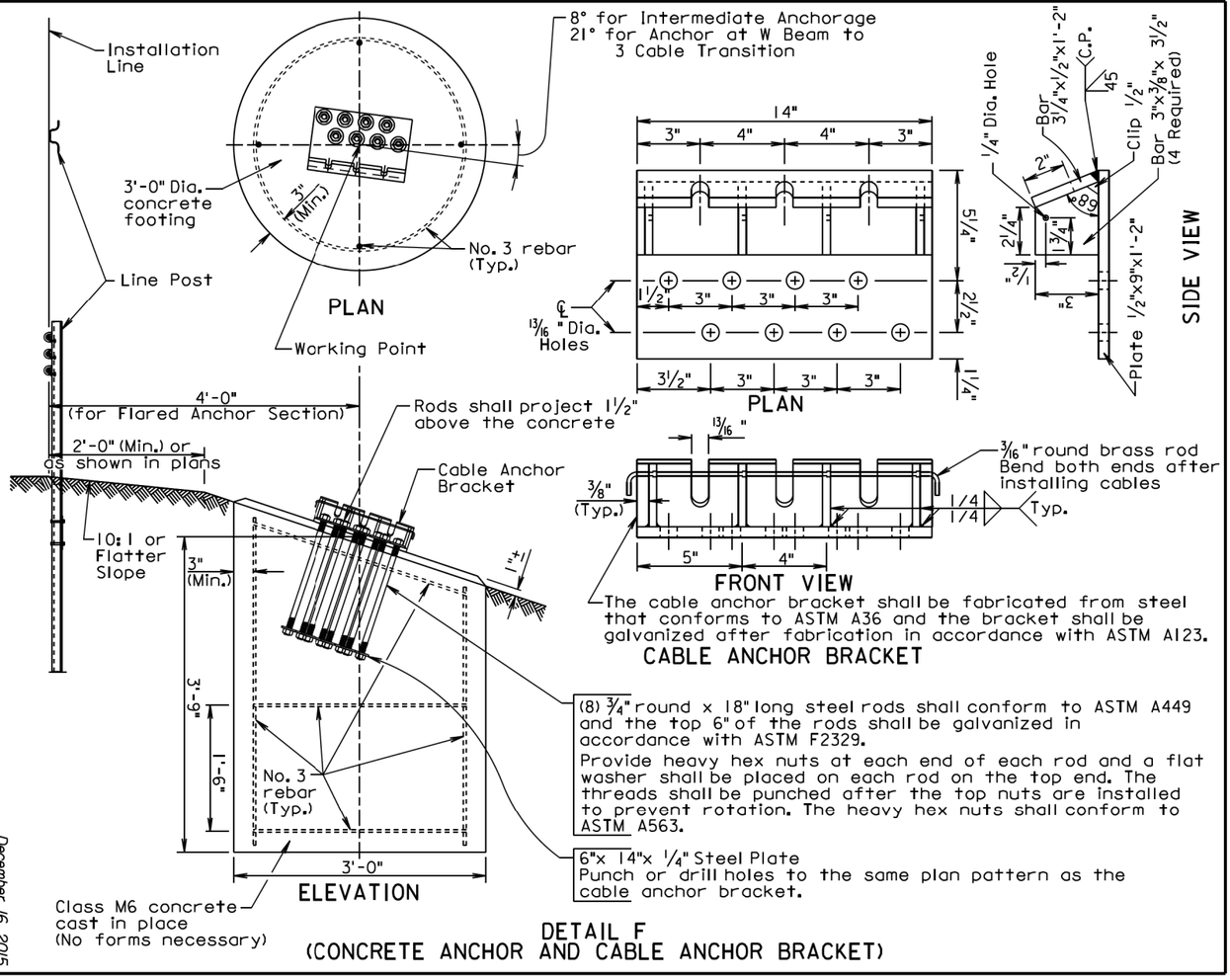
SDDOT

3 CABLE GUARDRAIL (LOW TENSION)

PLATE NUMBER 629.01

Sheet 3 of 6

December 16, 2015



DETAIL F
(CONCRETE ANCHOR AND CABLE ANCHOR BRACKET)

Published Date: 2nd Qtr. 2018

SDDOT

3 CABLE GUARDRAIL (LOW TENSION)

PLATE NUMBER 629.01

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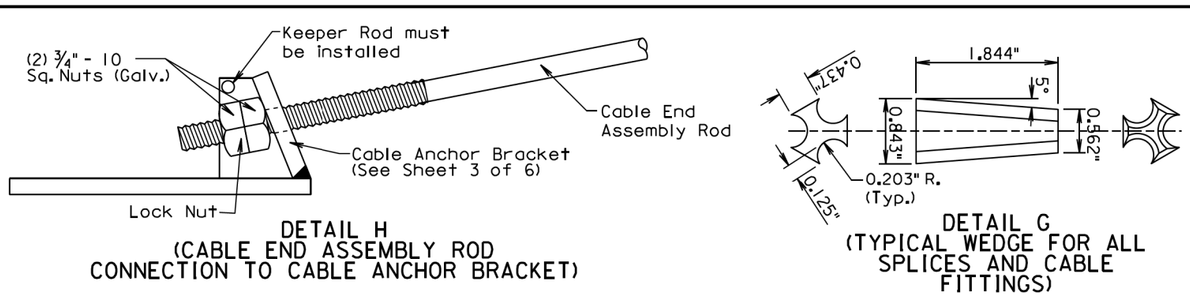
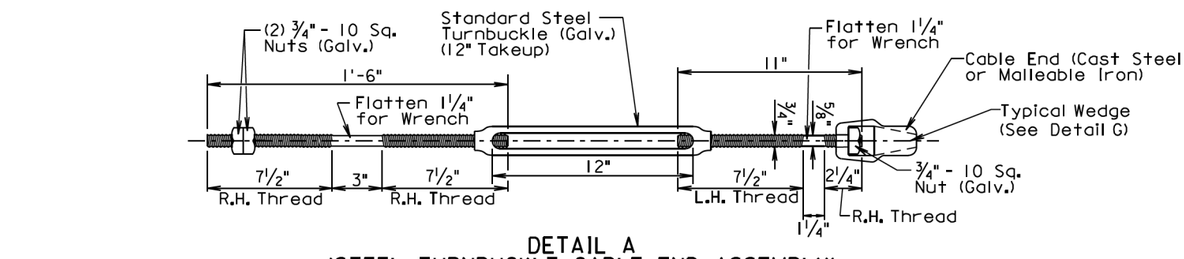
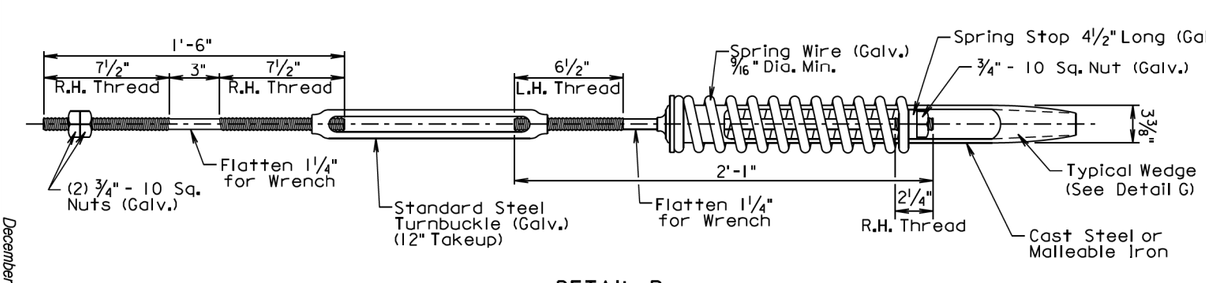


DETAIL H
(CABLE END ASSEMBLY ROD CONNECTION TO CABLE ANCHOR BRACKET)

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

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SDDOT

3 CABLE GUARDRAIL
(LOW TENSION)

PLATE NUMBER
629.01

Sheet 5 of 6

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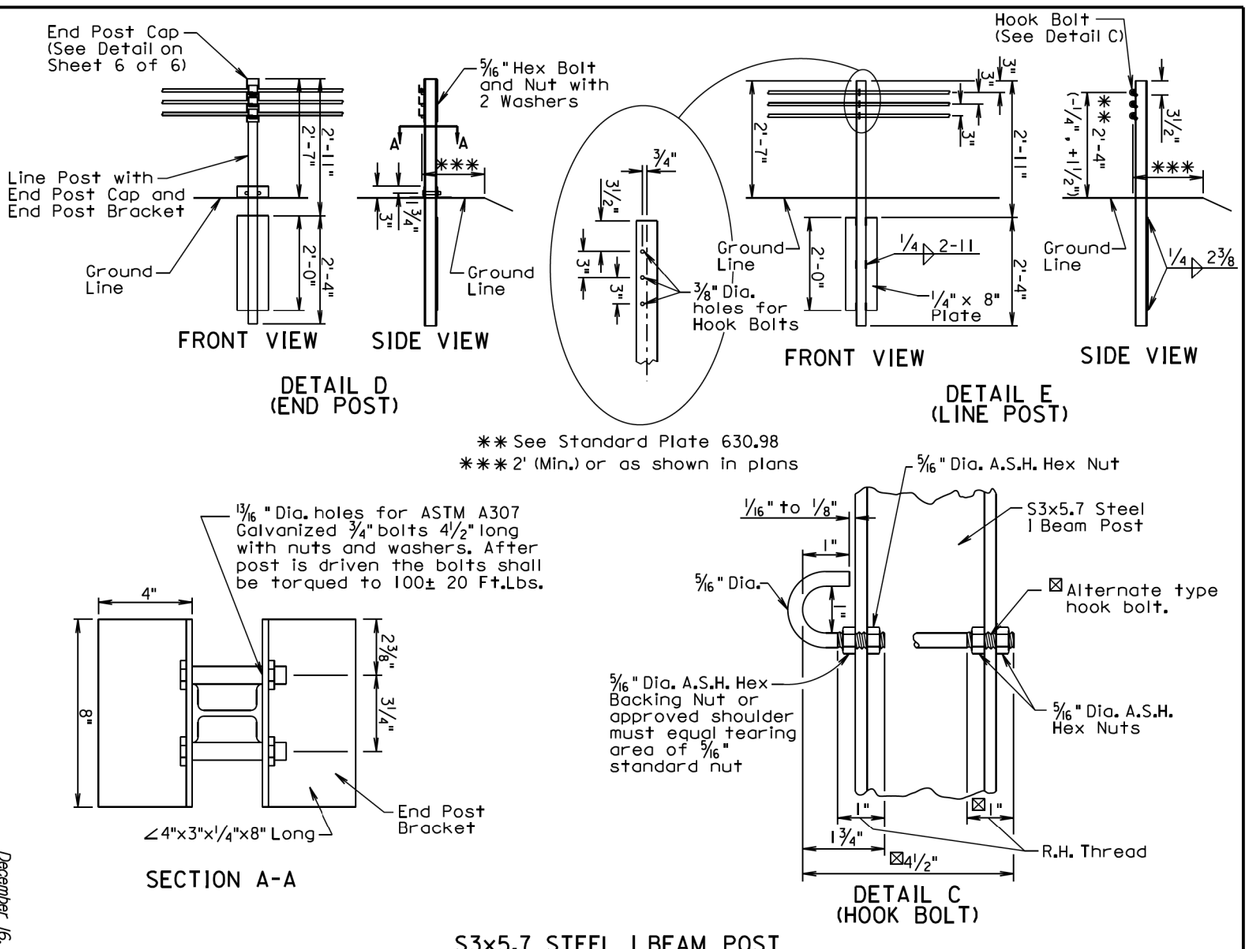

S3x5.7 STEEL I BEAM POST
FOR 3 CABLE GUARDRAIL

Published Date: 2nd Qtr. 2018

SDDOT

3 CABLE GUARDRAIL
(LOW TENSION)

PLATE NUMBER
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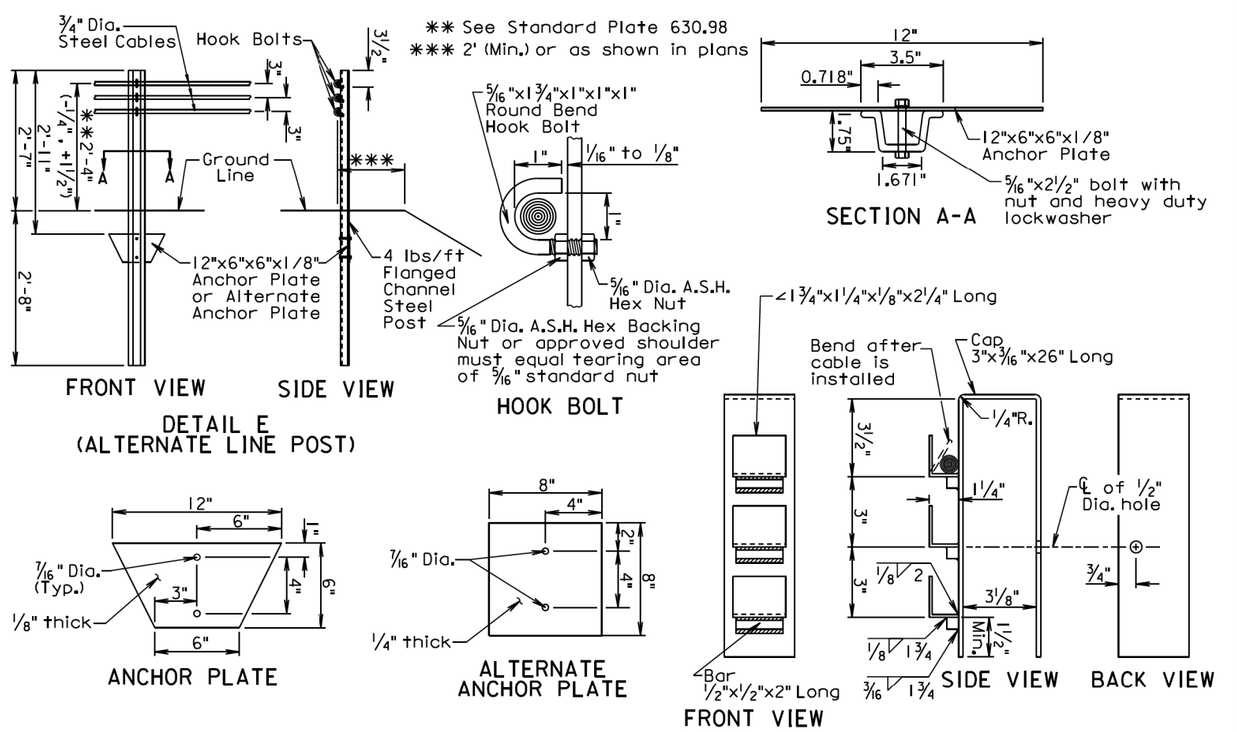
Sheet 6 of 6

December 16, 2015



FLANGED CHANNEL STEEL POST
FOR 3 CABLE GUARDRAIL

GENERAL NOTES:

Flanged channel steel posts shall be produced from high strength steel in accordance with ASTM A499, Grade 60.

Anchor plates shall be in conformance with ASTM A709, Grade 36.

Bolt shall be in conformance with ASTM A307. Nut shall be in conformance with ASTM A563 Grade DH.

Bolt shall be galvanized in accordance with ASTM F2329.

Finish for the post and anchor plate shall be a baked on high quality dark green enamel.

Alternate anchor plate may be unfinished.

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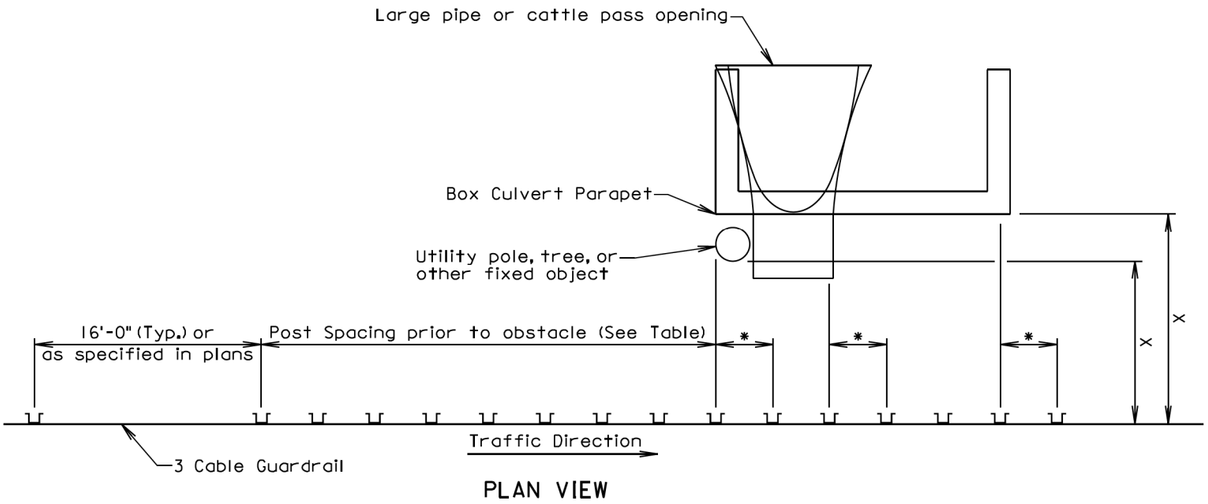
SDDOT

3 CABLE GUARDRAIL (LOW TENSION) POST SPACING FOR DEFLECTION CONTROL



PLAN VIEW

POST SPACING PRIOR TO OBSTACLE		
X Deflection Distance (Ft)	Number of Post Spaces	Post Spacing (Ft)
10.5 to 11.4	8	4
11.5 to 12.9	6	8
13.0 to 14.9	4	12
15 and Greater	3	16

GENERAL NOTES:

* Post spacing for deflection control shall continue to one post past the obstacle for one-way traffic.

Post spacing for deflection control shall be provided on both sides of the obstacle for two-way traffic.

For illustrational purposes, the 3 cable guardrail posts and post spacings shown on this standard plate depict the situation when there is a box culvert 10.5' to 11.49' away from the 3 cable guardrail and the traffic is one-way.

This standard plate shall not be used for high tension cable guardrail installations.

PLATE NUMBER 629.02

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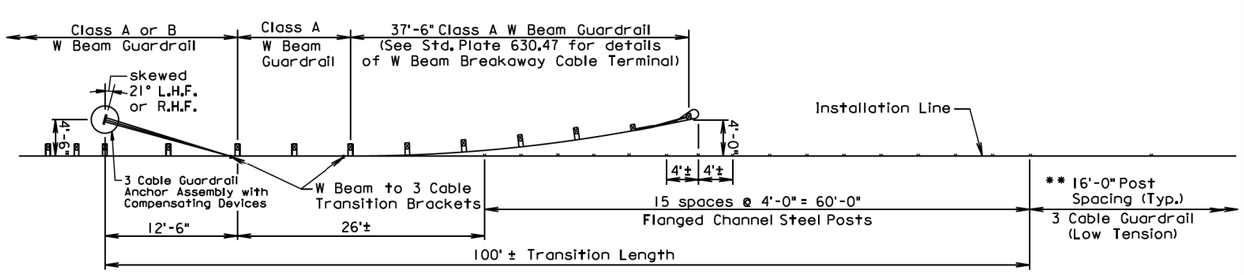
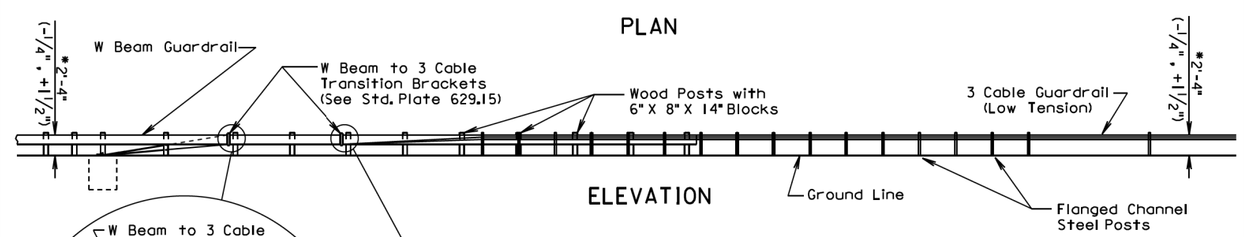
SDDOT

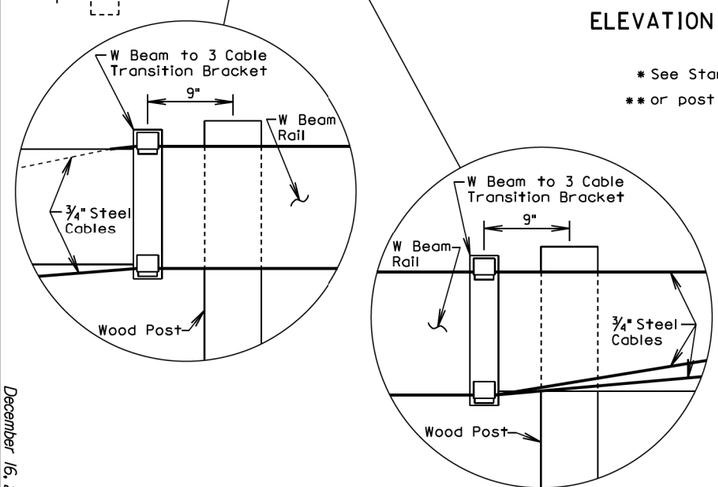
W BEAM TO 3 CABLE TRANSITION



PLAN



ELEVATION



* See Standard Plate 630.98

** or post spacing as specified in the plans

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.

PLATE NUMBER 629.05

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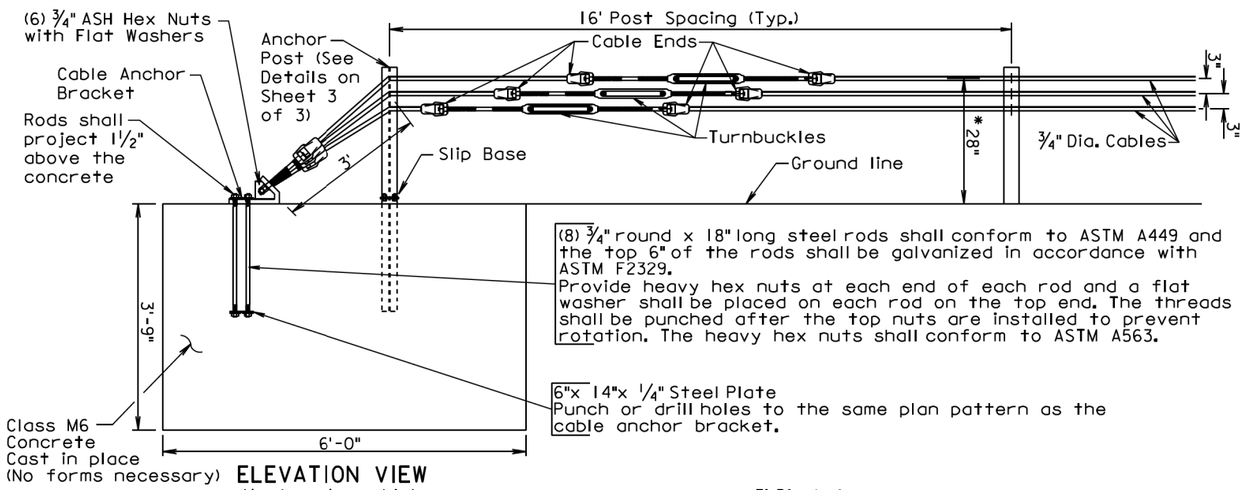
SDDOT

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

PLATE NUMBER 629.10

Sheet 1 of 3

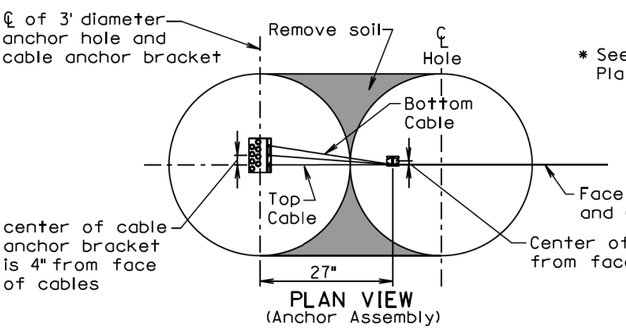
June 26, 2016



(8) ¾" round x 18" long steel rods shall conform to ASTM A449 and the top 6" of the rods shall be galvanized in accordance with ASTM F2329.
Provide heavy hex nuts at each end of each rod and a flat washer shall be placed on each rod on the top end. The threads shall be punched after the top nuts are installed to prevent rotation. The heavy hex nuts shall conform to ASTM A563.

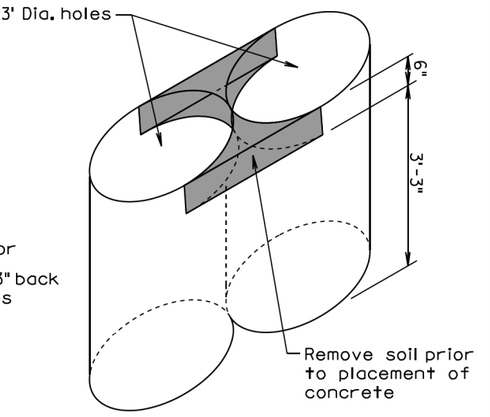
6"x 14"x ¼" Steel Plate
Punch or drill holes to the same plan pattern as the cable anchor bracket.

ELEVATION VIEW
(Anchor Assembly)



* See Standard Plate 630.98

PLAN VIEW
(Anchor Assembly)



ISOMETRIC VIEW

ANCHOR CONSTRUCTION NOTES:

1. Auger two 3' diameter by 3'-9" deep holes tangent to each other.
2. Clean out the top 6 inches of soil between the holes.
3. Place concrete in holes with anchor bolts and slip base stub post in place.
4. For informational purposes the neat line concrete volume of the anchor is 1.9 cubic yards.

Published Date: 2nd Qtr. 2018

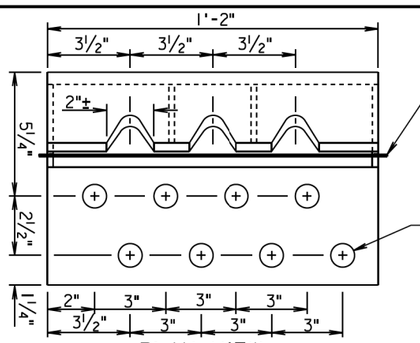
SDDOT

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

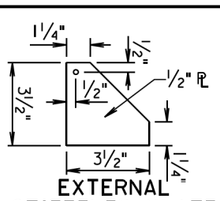
PLATE NUMBER 629.10

Sheet 2 of 3

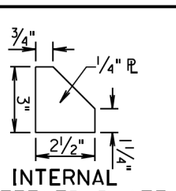
June 26, 2016



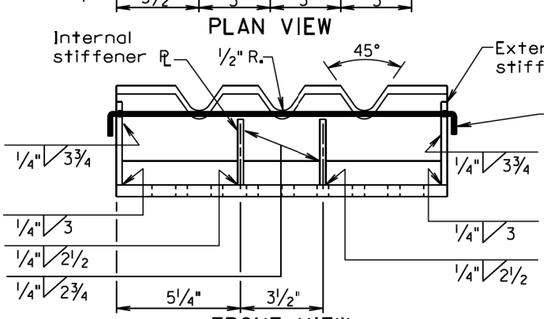
PLAN VIEW



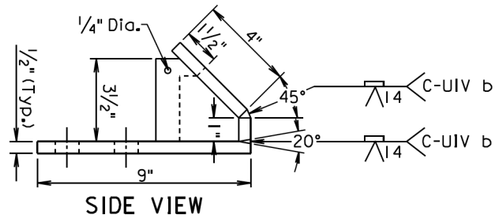
EXTERNAL STIFFENER PLATE



INTERNAL STIFFENER PLATE

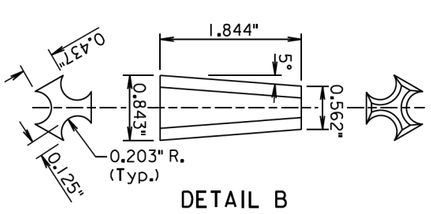


FRONT VIEW

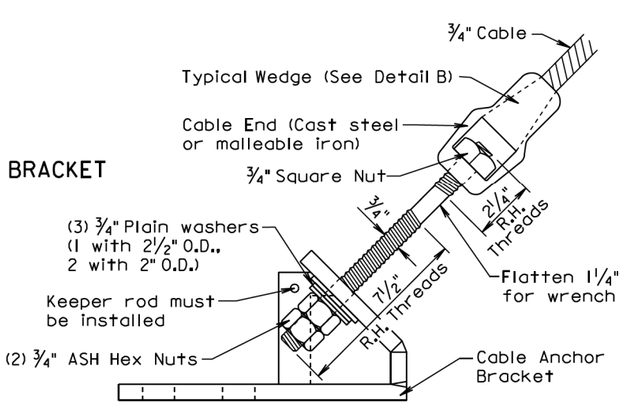


SIDE VIEW

CABLE ANCHOR BRACKET



DETAIL B
(Typical Wedge for All Splices and Cable Fittings)



CABLE END ASSEMBLY ROD CONNECTION TO CABLE ANCHOR BRACKET

Plotting Date: 06/18/2018

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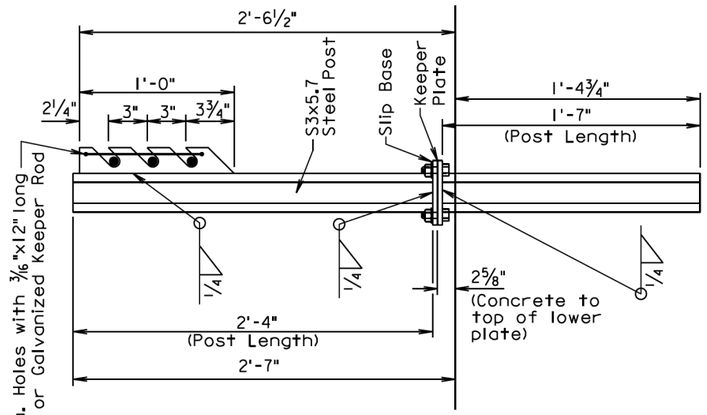
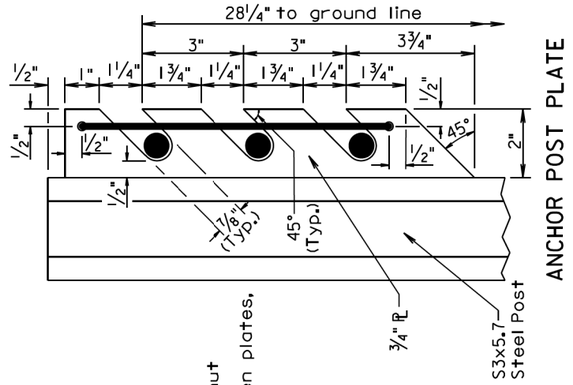
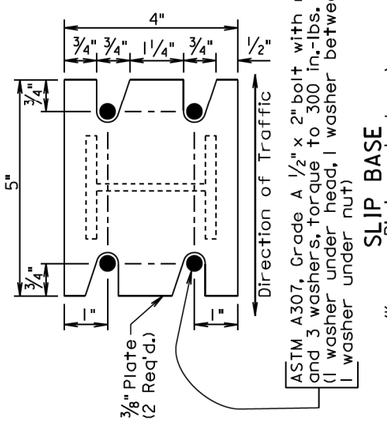
	000I-469, 000N-469 & 000P-469	10	22



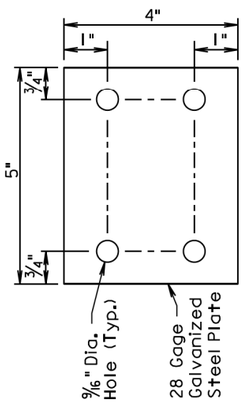
ANCHOR POST



ANCHOR POST PLATE



SLIP BASE
(Keeper Plate not shown)



KEEPER PLATE

GENERAL NOTES:

Anchor post shall be a S3x5.7 rolled steel section. Post and plates shall conform to ASTM A709, Grade 36 and shall be galvanized in accordance with ASTM A123.

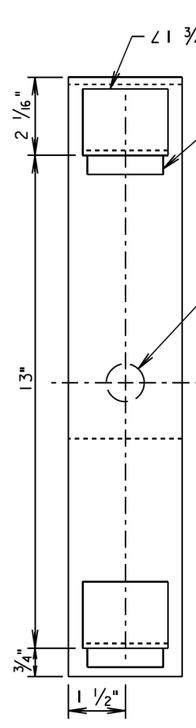
¾" round wire cable shall consist of three strands (7 wires per strand) and have a minimum tensile strength of 25,000 pounds.

Cast steel elements shall conform to AASHTO M103 (ASTM 27-73) grade U-60-30.

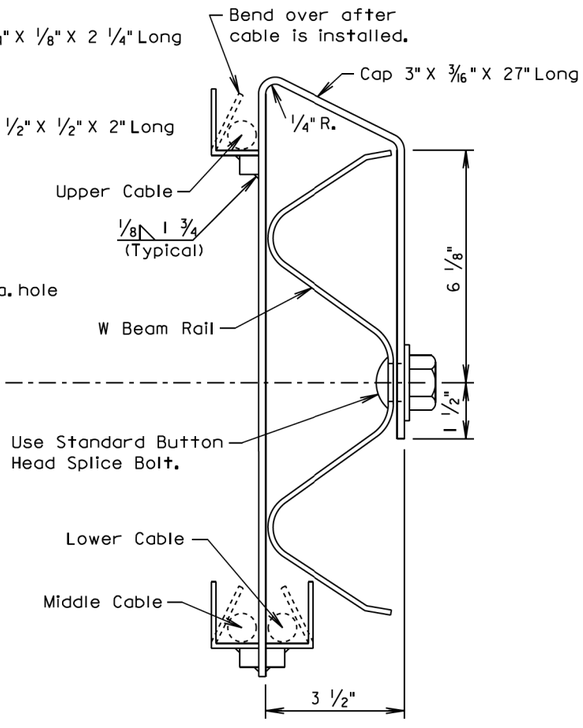
All costs associated with furnishing and constructing the 3 cable guardrail slip base anchor assembly including the concrete anchor, cable anchor bracket, anchor bolts, plates, slip base stub post, anchor post, steel turnbuckles, cable ends, and necessary hardware shall be incidental to the contract unit price per each for "3 Cable Guardrail Slip Base Anchor Assembly".

June 26, 2016

Published Date: 2nd Qtr. 2018	SDDOT	3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY	PLATE NUMBER 629.10
			Sheet 3 of 3



ELEVATION
(TRANSITION BRACKET)



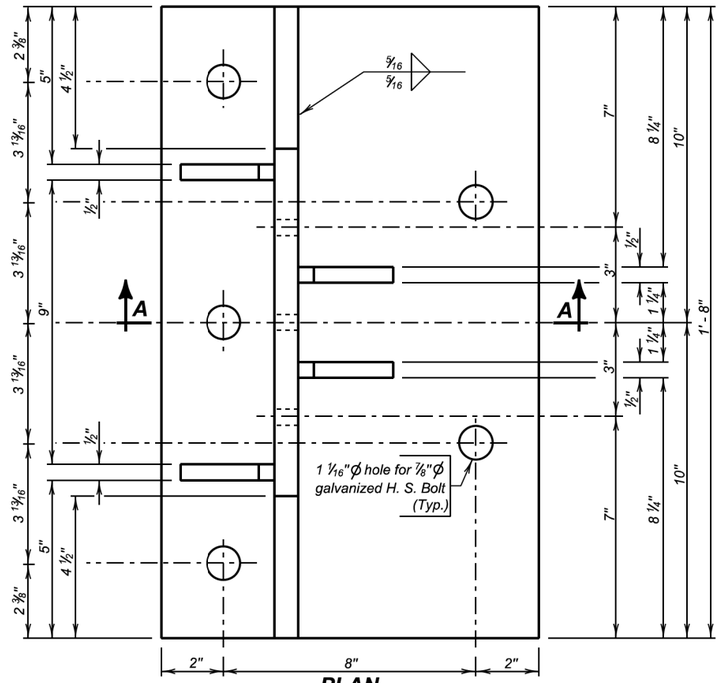
END VIEW
(W BEAM RAIL AND TRANSITION BRACKET)

GENERAL NOTES:

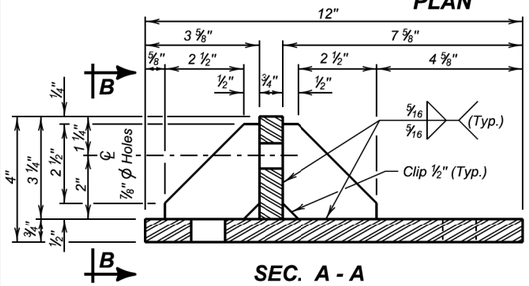
Steel used in the fabrication of the bracket shall conform to ASTM A36 and the bracket shall be galvanized after fabrication in accordance with ASTM A123.

March 31, 2000

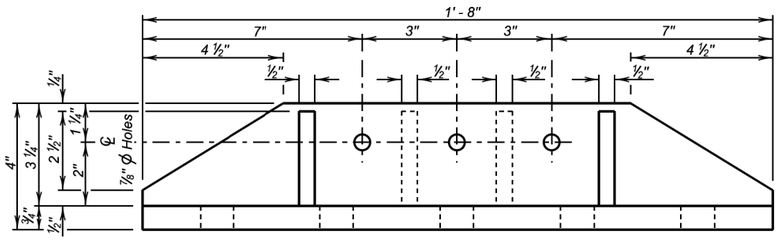
Published Date: 2nd Qtr. 2018	SDDOT	W BEAM TO 3 CABLE TRANSITION BRACKET	PLATE NUMBER 629.15
			Sheet 1 of 1



PLAN



SEC. A - A



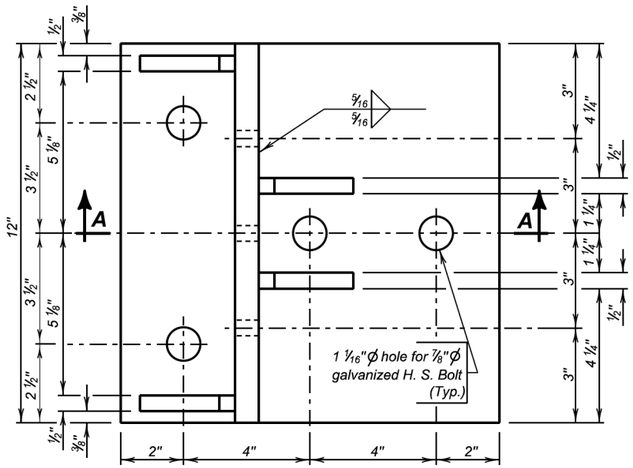
VIEW B - B

GENERAL NOTES:

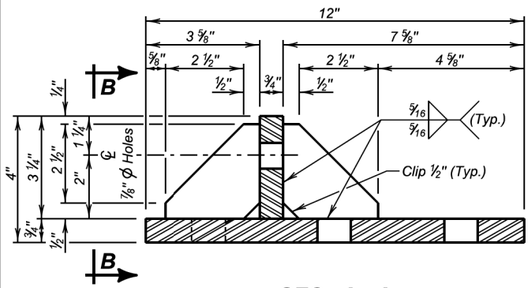
1. All steel shall conform to ASTM A709 Grade 36.
2. Welding and weld inspection shall be in conformance with AWS/ANSI D1.1 (Current Year) Structural Welding Code - Steel.
3. After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).
4. Bolts, nuts, and washers shall be provided with each assembly. Bolts shall be galvanized and conform to the requirements of ASTM A307 or A449. Plain washers shall be galvanized and conform to ASTM F844.
5. All Costs associated with furnishing and installing the 3 cable guardrail connection assembly shall be incidental to the contract unit price for the bid items "Class A45 Concrete, Bridge Deck", "Class A45 Concrete, Bridge Repair", or "3 Cable Guardrail", as applicable.

June 26, 2012

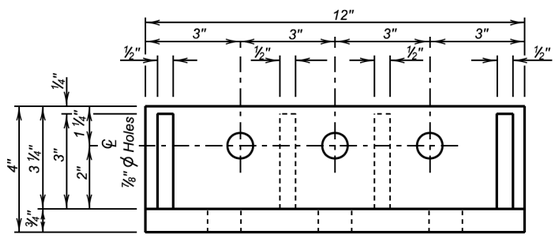
Published Date: 2nd Qtr. 2018	SDDOT	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER 629.30
			Sheet 1 of 1



PLAN



SEC. A - A



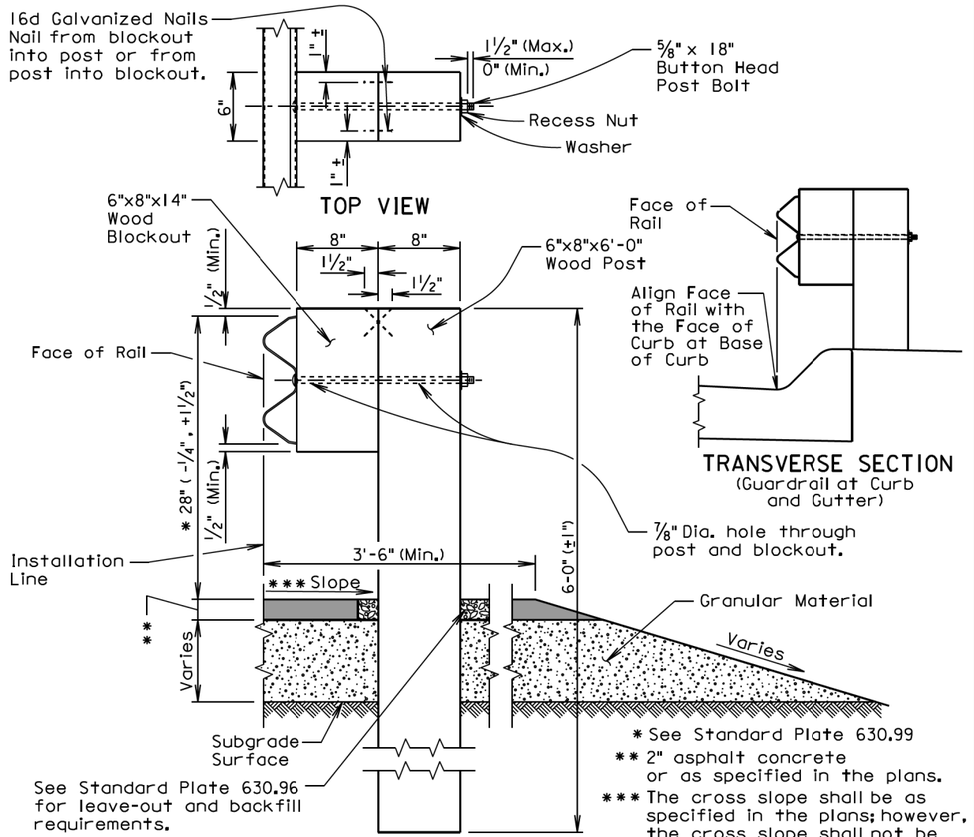
VIEW B - B

GENERAL NOTES:

1. All steel shall conform to ASTM A709 Grade 36.
2. Welding and weld inspection shall be in conformance with AWS/ANSI D1.1 (Current Year) Structural Welding Code - Steel.
3. After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).
4. When required, provide 7/8 inch diameter x 2 1/2 inch high strength cap screws with heavy hex heads and plate washers. Cap screws shall be galvanized and conform to the requirements of ASTM A307 or A449. Plain washers shall be galvanized and conform to ASTM F844.
5. All Costs associated with furnishing and installing the 3 cable guardrail connection assembly shall be incidental to the contract unit price for the bid items "Class A45 Concrete, Bridge Deck", "Class A45 Concrete, Bridge Repair", or "3 Cable Guardrail", as applicable.

June 26, 2012

Published Date: 2nd Qtr. 2018	SDDOT	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER 629.31
			Sheet 1 of 1



GENERAL NOTES:

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

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

Topsoil is not shown in the transverse section drawing.

All W beam rail shall be Type I and Class A (12 Ga.) unless specified otherwise in the plans.

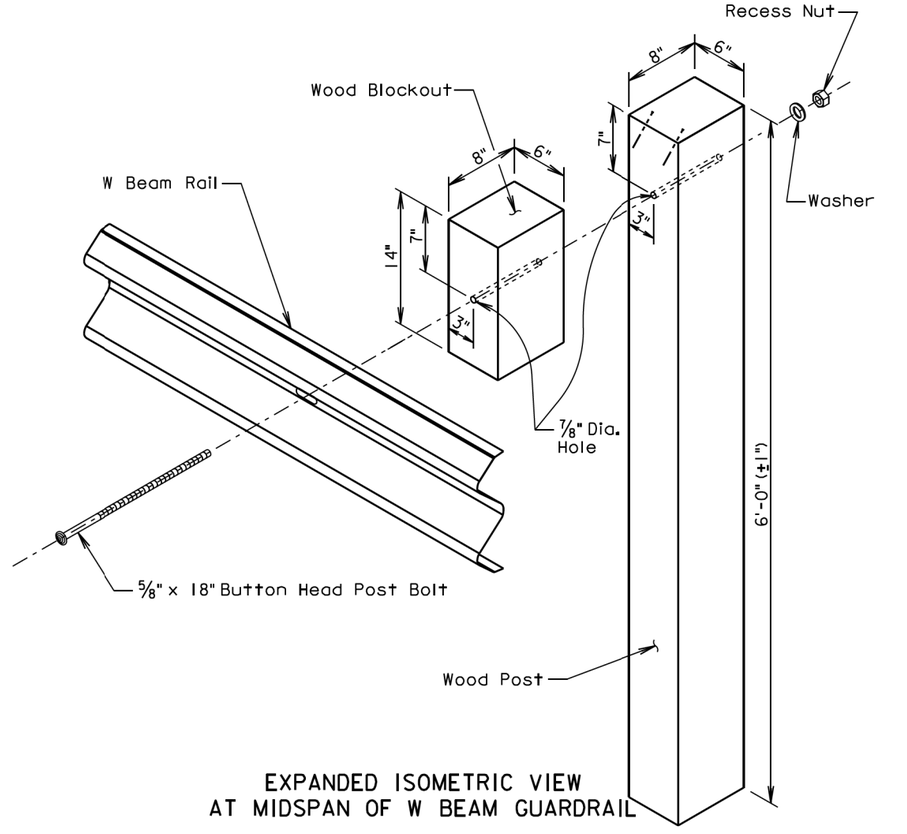
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

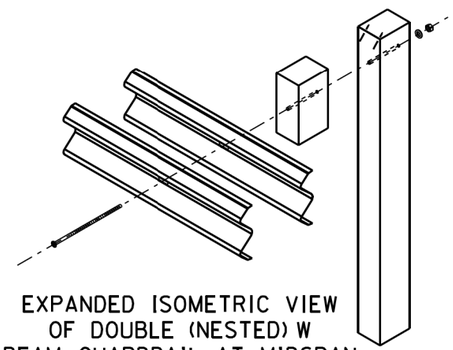
Slots in the rails shall be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges shall be smooth and free of burrs or notches.

The top of post and top of block shall have a true square cut. The top of block shall be a maximum of ±½ inch from the top of the post.

February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 1 of 5

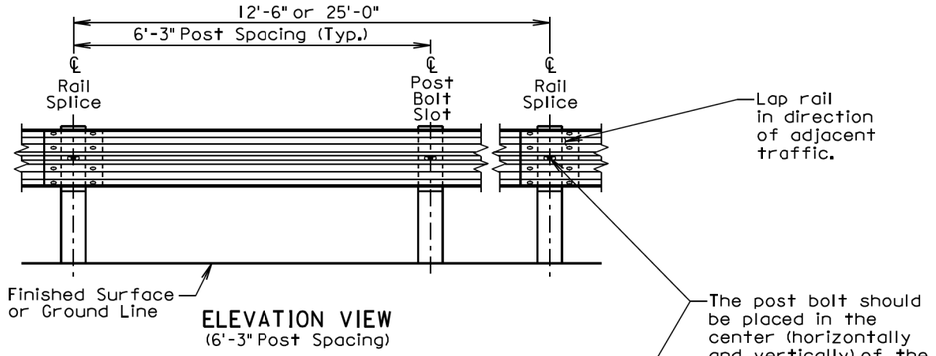




EXPANDED ISOMETRIC VIEW OF DOUBLE (NESTED) W BEAM GUARDRAIL AT MIDSPAN
(For Information Only, Not to Scale)

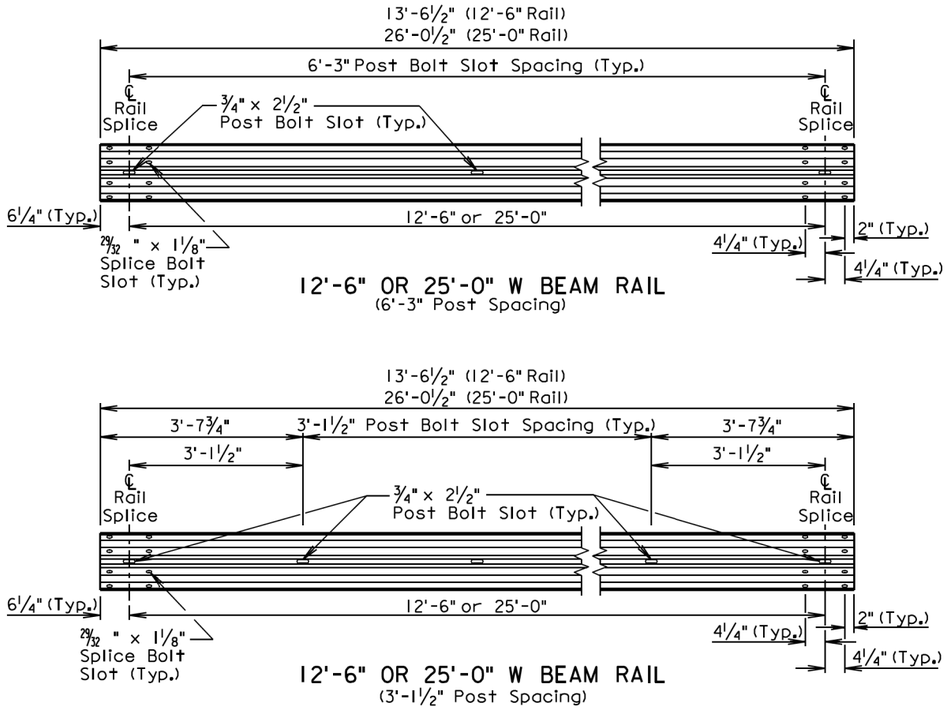
February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 2 of 5



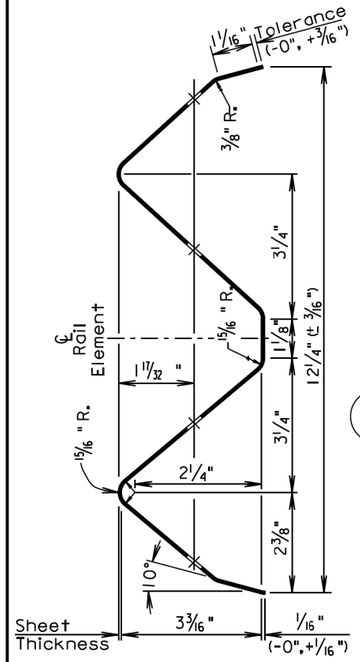
February 14, 2017

Published Date: 2nd Qtr. 2018	**SDDOT**	**W BEAM GUARDRAIL**	***PLATE NUMBER*** *630.10*
			Sheet 3 of 5

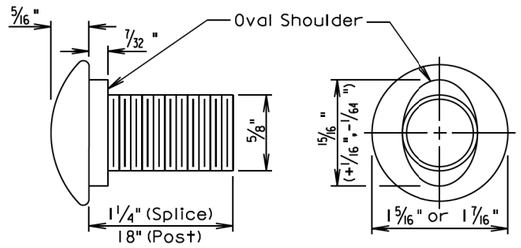


February 14, 2017

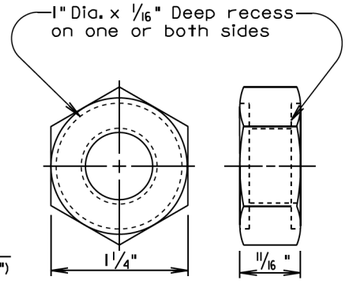
Published Date: 2nd Qtr. 2018	**SDDOT**	**W BEAM GUARDRAIL**	***PLATE NUMBER*** *630.10*
			Sheet 4 of 5



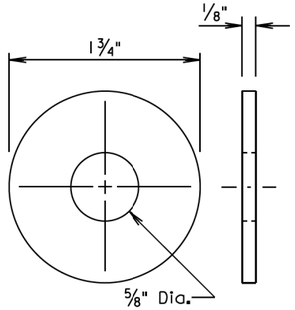
SECTION THROUGH W BEAM RAIL



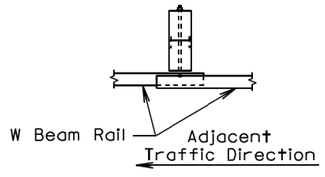
SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)



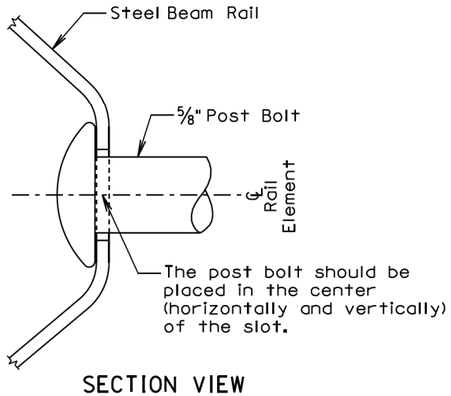
RECESS NUT
(At lap splices, the recess shall be placed against the steel rail.)



WASHER
(The washer shall be placed between the back side of wood post and the recess nut, see sheet 1 and 2.)



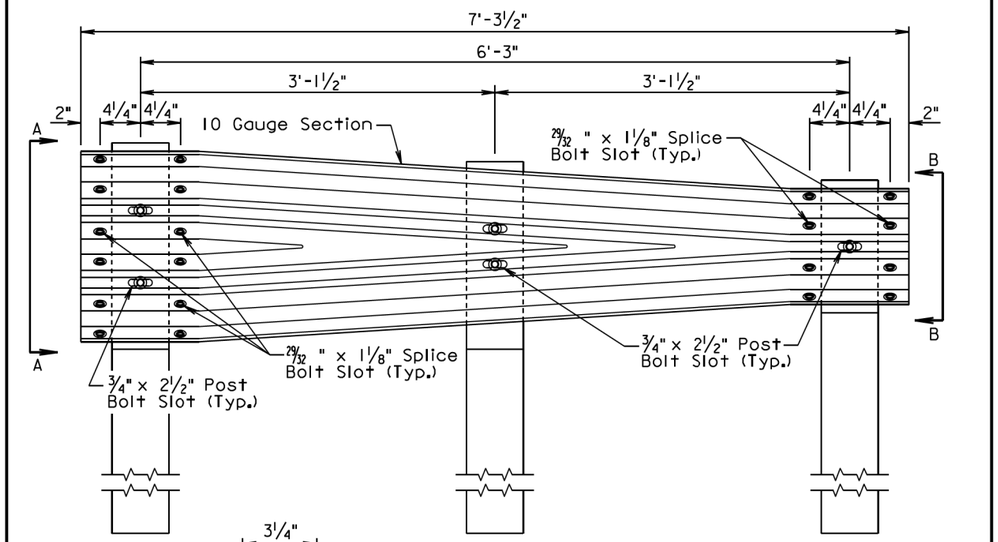
PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(8 splice bolts and 8 recess nuts per splice, NO washers)



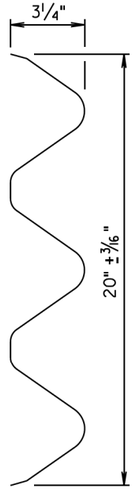
SECTION VIEW
(At Post Bolt)

February 14, 2017

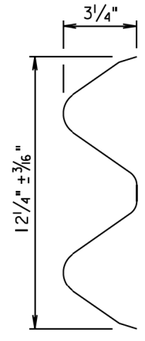
Published Date: 2nd Qtr. 2018	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 5 of 5



ELEVATION VIEW



VIEW A-A



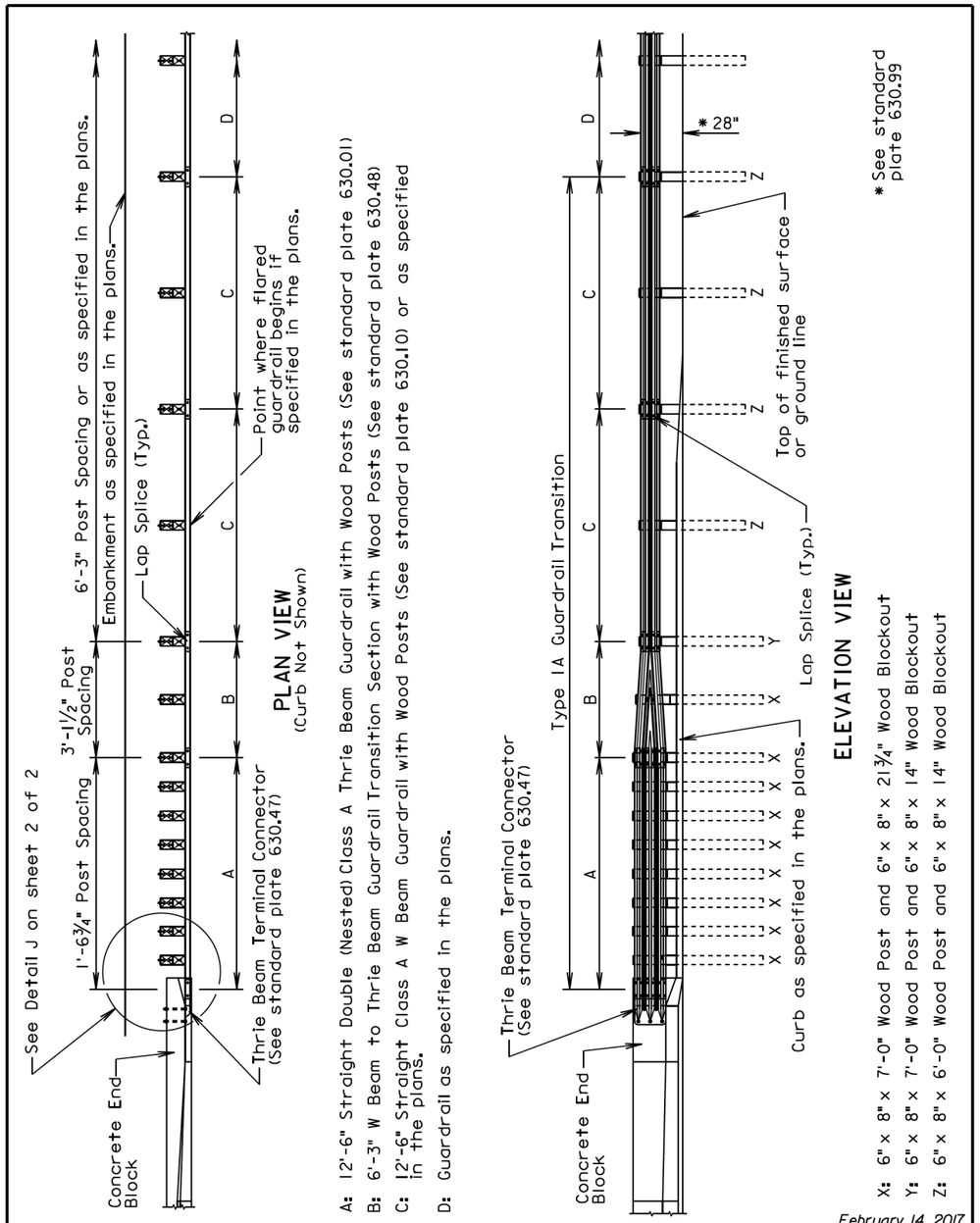
VIEW B-B

GENERAL NOTES:

All costs for furnishing and installing 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".

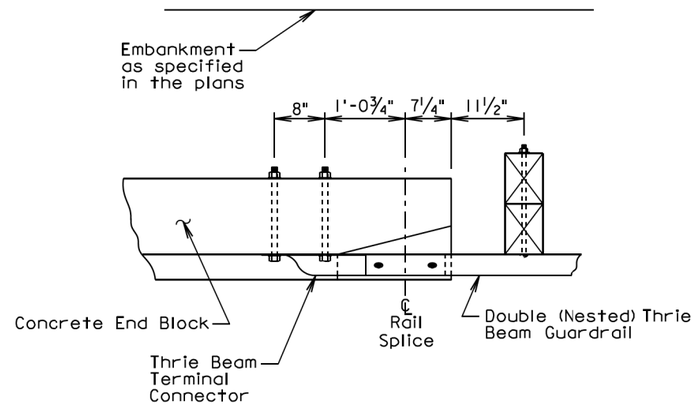
February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.48
			Sheet 1 of 1



February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	TYPE 1A GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.52 Sheet 1 of 2



DETAIL J

GENERAL NOTES:

Throughout the type 1A guardrail transition, slots in the rails shall be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges shall be smooth and free of burrs or notches.

All costs for furnishing and installing the straight double class A thrie beam guardrail including labor, equipment, and materials including the thrie beam rails, posts, blockouts, thrie beam terminal connector, and hardware shall be incidental to the contract unit price per foot for "Straight Double Class A Thrie Beam Guardrail with Wood Posts".

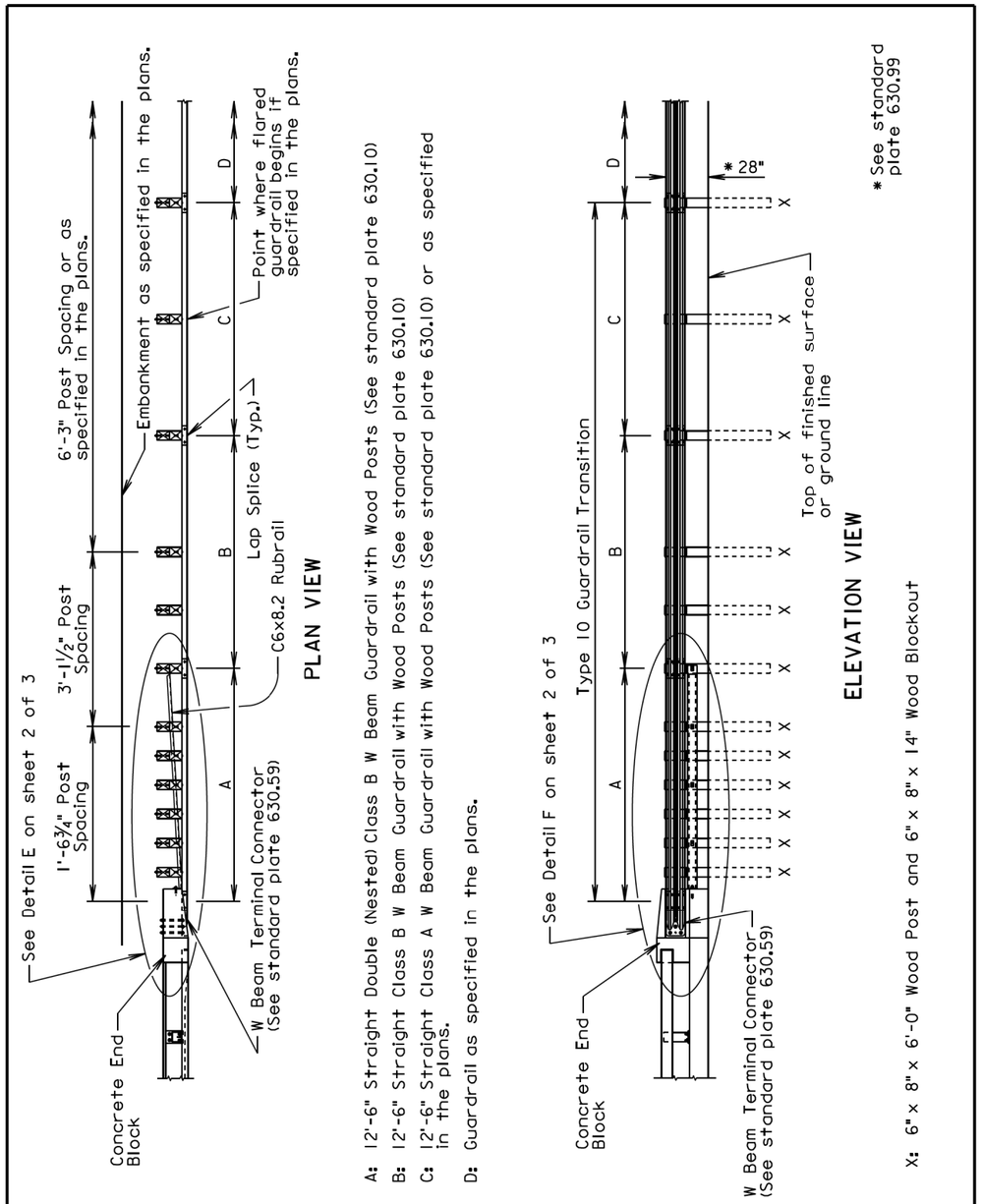
All costs for furnishing and installing the type 1A guardrail transition including labor, equipment, and materials shall be included in the contract unit price for the respective guardrail bid items.

February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	TYPE 1A GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.52 Sheet 2 of 2

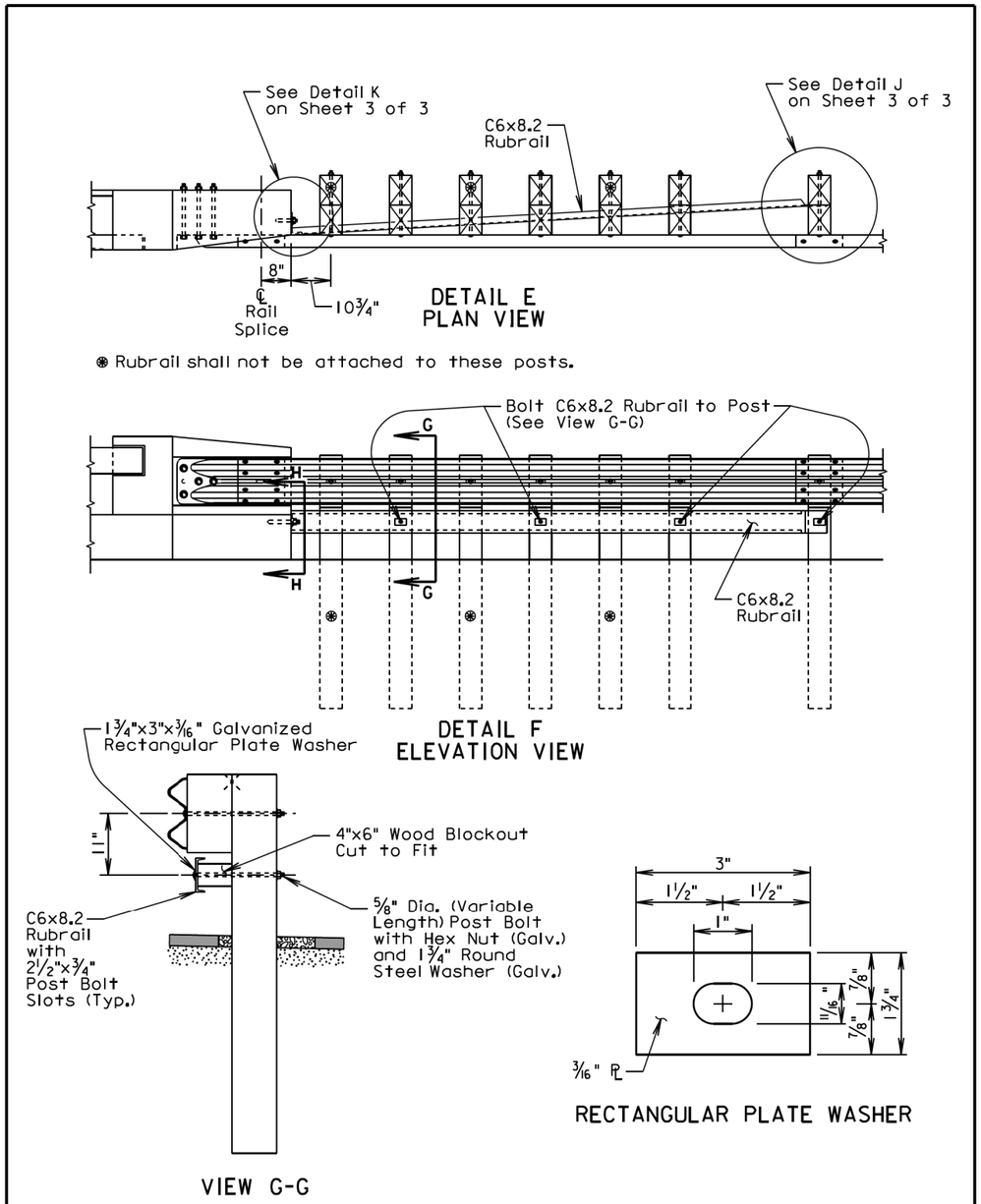
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-469, 000N-469 & 000P-469	17	22

Plotting Date: 06/18/2018



February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	TYPE 10 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.60
			Sheet 1 of 3



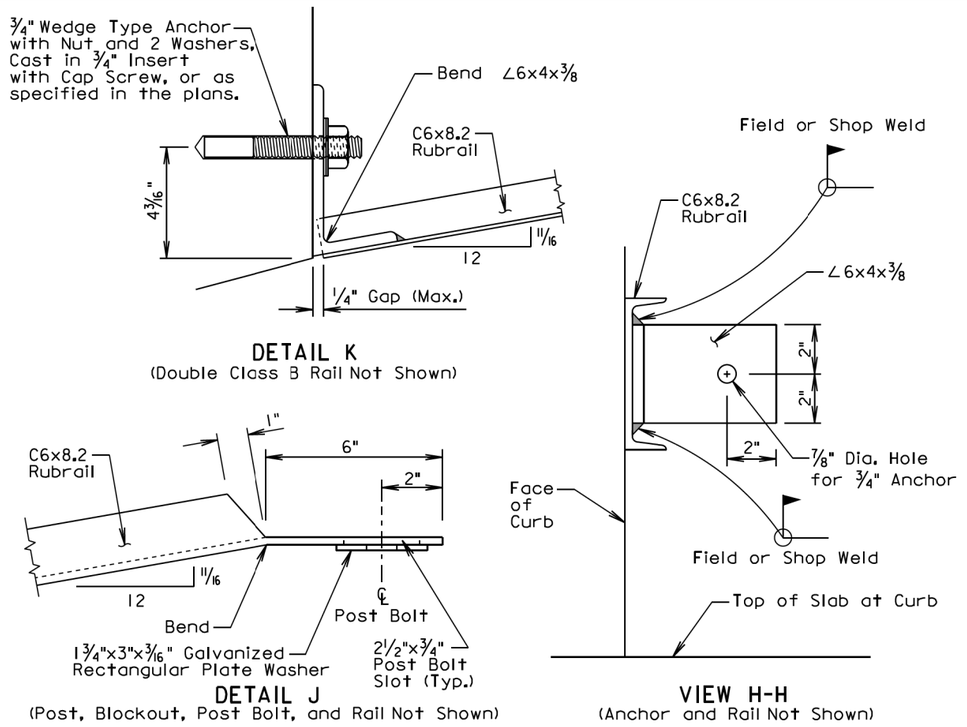
February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	TYPE 10 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.60
			Sheet 2 of 3

Plot Scale - 1:200

Plotted From - trrc11951

File - ...\StdPlateSectionSeed.dgn



GENERAL NOTES:

Throughout the type 10 guardrail transition, slots in the rails shall be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges shall be smooth and free of burrs or notches.

The rubrail steel shall be in conformance with ASTM A36 and shall be galvanized after fabrication in conformance with ASTM A123. If pre-galvanized steel members are used, all cuts and welds shall be coated with an approved galvanizing paint.

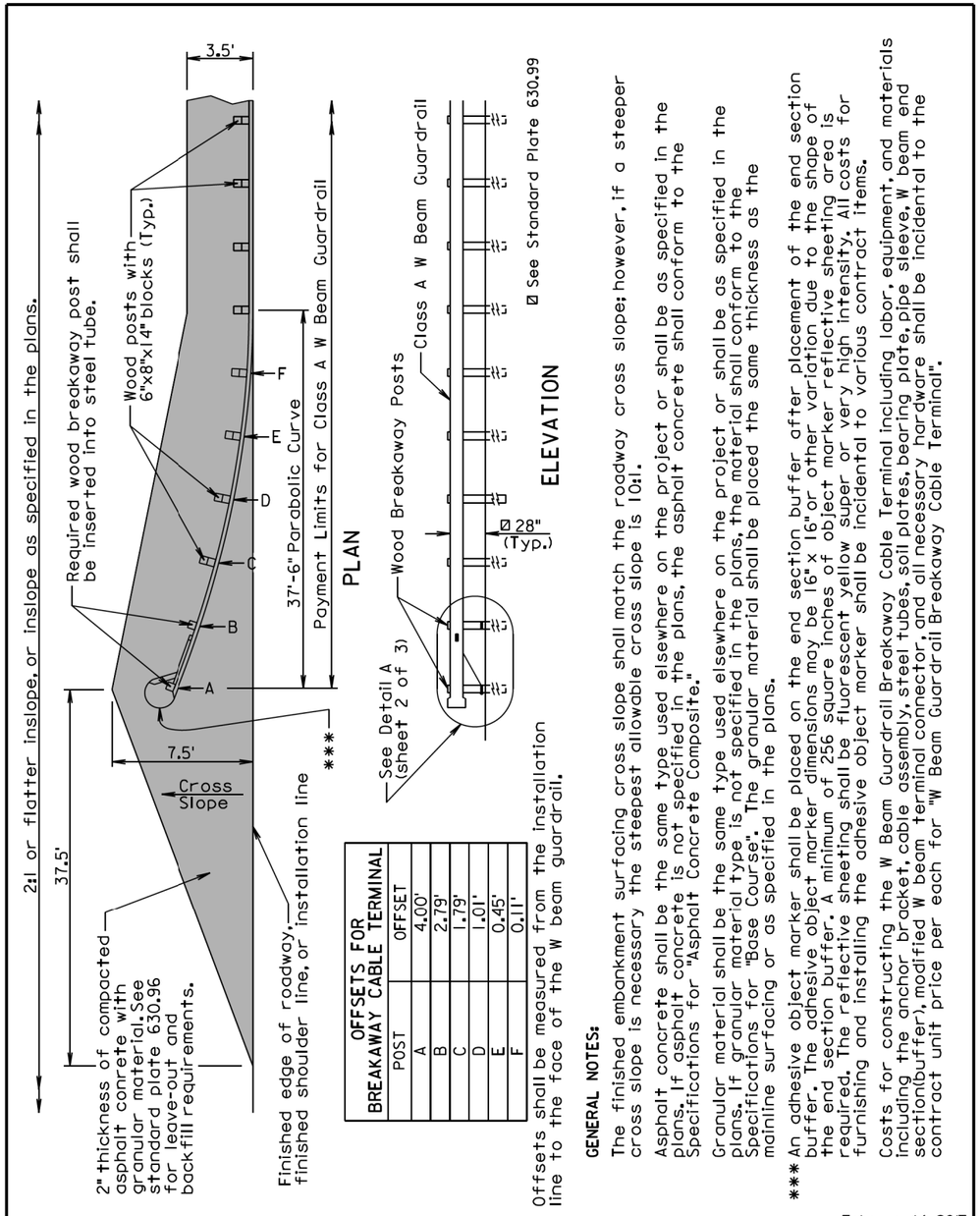
The wedge type anchor bolt, nut, and washers shall be hot dipped galvanized or made of a corrosion resistent material. The wedge type anchor shall be capable of sustaining an ultimate load in tension or shear of 17,000 pounds when the anchor is set in 4,500 psi compressive strength concrete. The anchor shall be installed according to the manufacturer's recommendations. The Contractor shall obtain certification from the manufacturer that the anchor meets the tensile and shear requirements and shall submit the certification to the Engineer. The cost for furnishing and installing the wedge type anchor, nut, and washers shall be incidental to the contract unit price per foot for "Rubrail".

All costs for furnishing and installing the straight double class B W beam guardrail including labor, equipment, and materials including the W beam rails, posts, blockouts, W beam terminal connector, and hardware shall be incidental to the contract unit price per foot for "Straight Double Class B W Beam Guardrail with Wood Posts".

All costs for furnishing and installing the type 10 guardrail transition including labor, equipment, and materials shall be included in the contract unit price for the respective guardrail bid items.

February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	TYPE 10 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.60
			Sheet 3 of 3



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'

GENERAL NOTES:

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

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

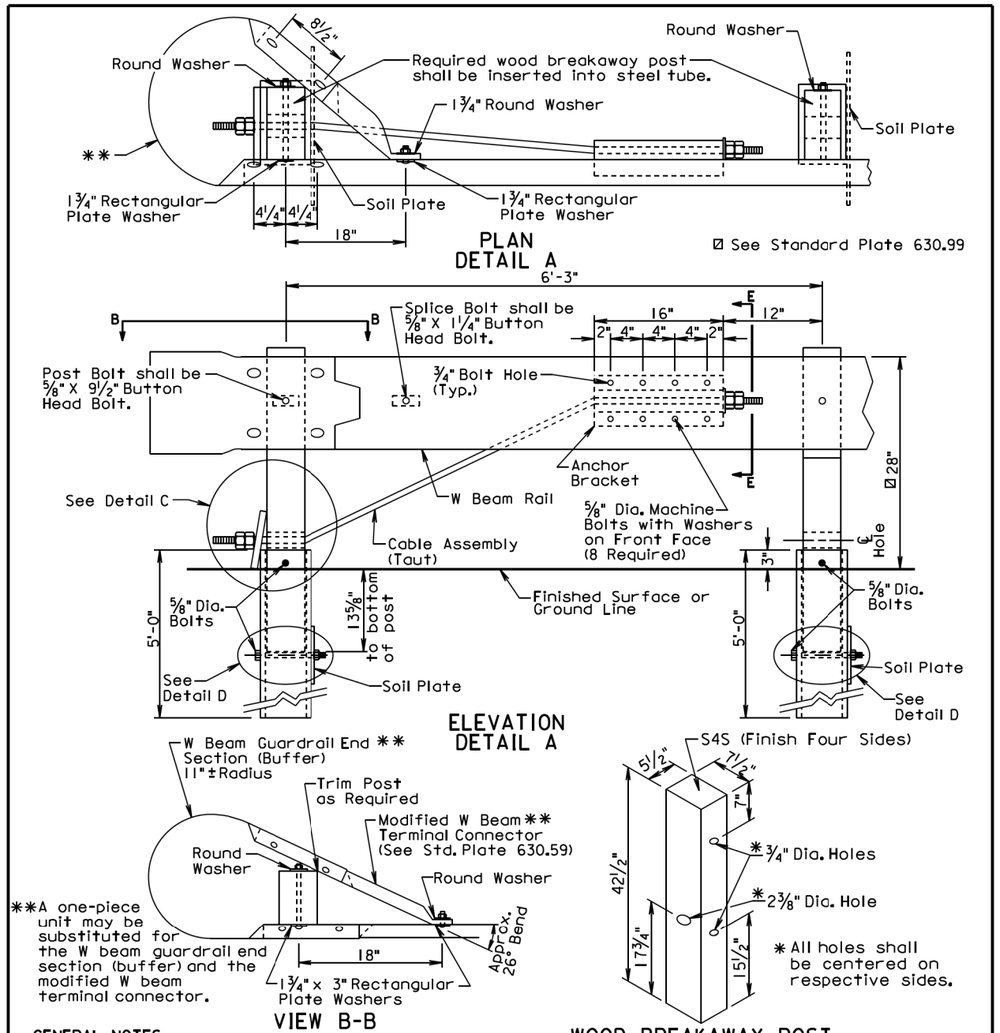
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed on the end section buffer after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

*** An adhesive object marker shall be placed on 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".

February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.85
			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.

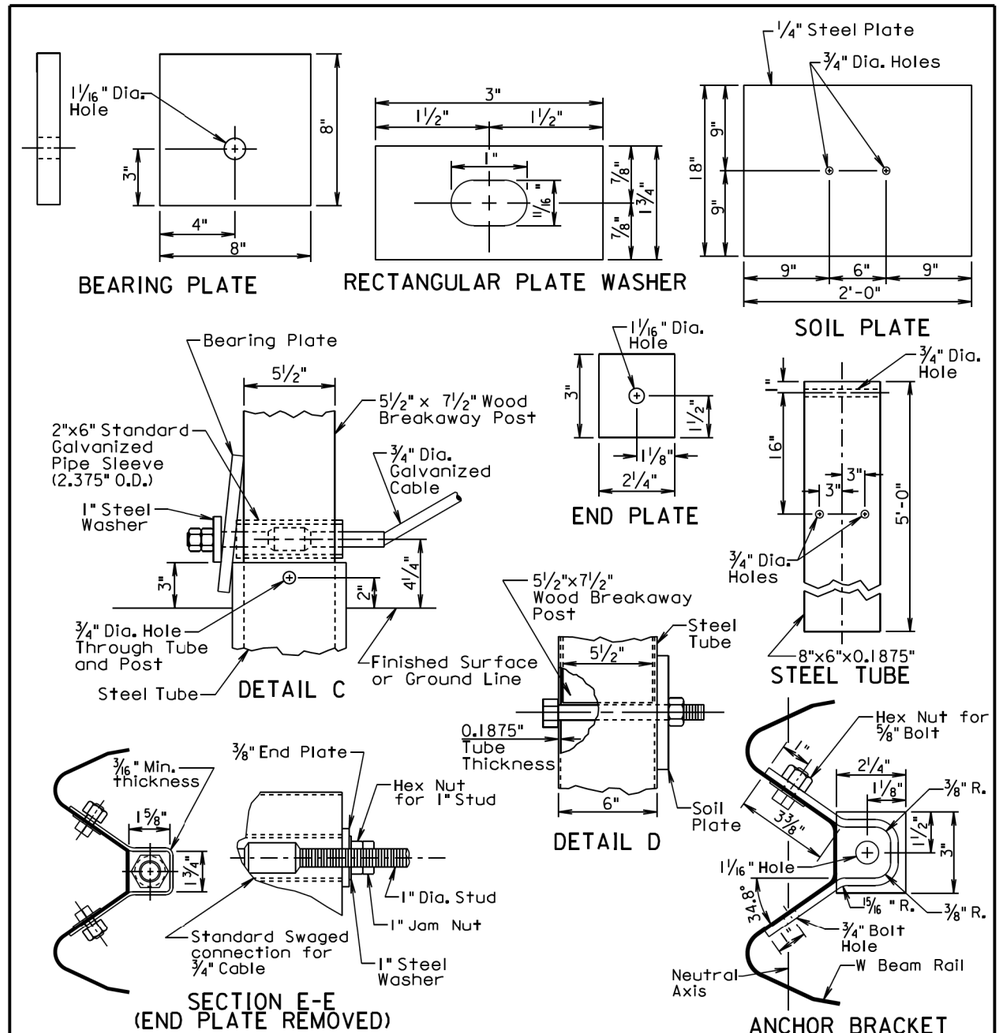
The anchor bracket, soil plate, and bearing plate shall be fabricated from steel that meets ASTM A36 Specifications. They shall be galvanized after fabrication in accordance with ASTM A123.

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.

February 14, 2017

Published Date: 2nd Qtr. 2018	SDDOT	**W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL**	*PLATE NUMBER* 630.85
			Sheet 2 of 3



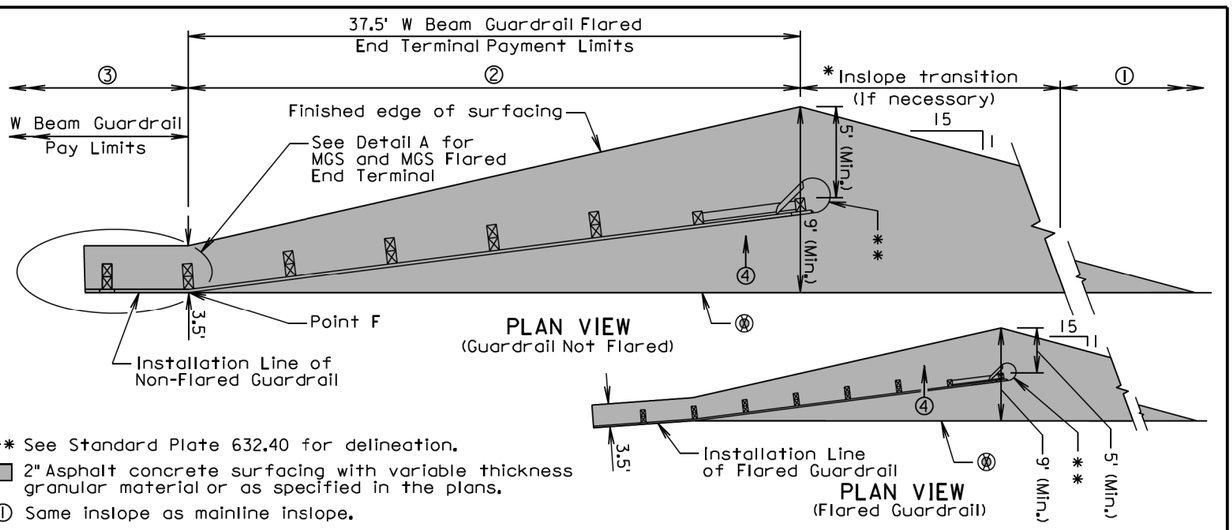
February 14, 2017

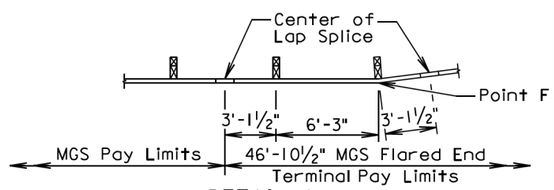
Published Date: 2nd Qtr. 2018	SDDOT	**W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL**	*PLATE NUMBER* 630.85
			Sheet 3 of 3

Published Date: 2nd Qtr. 2018

SDDOT

EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR W BEAM GUARDRAIL FLARED END TERMINAL AND MGS FLARED END TERMINAL





** See Standard Plate 632.40 for delineation.

2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.

① Same inslope as mainline inslope.

② 4:1 inslope or flatter as specified in the plans. Inslope shall not be steeper than a 4:1 slope.

③ Inslope as specified in the plans.

④ Same slope as roadway cross slope or as specified in the plans. Slope shall not be steeper than a 10:1 slope.

GENERAL NOTES:

The flared guardrail end terminals above are for illustrative purpose only.

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

Ⓜ The installation reference line for flared guardrail end terminals shall always be parallel to the roadway.

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

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

December 23, 2017

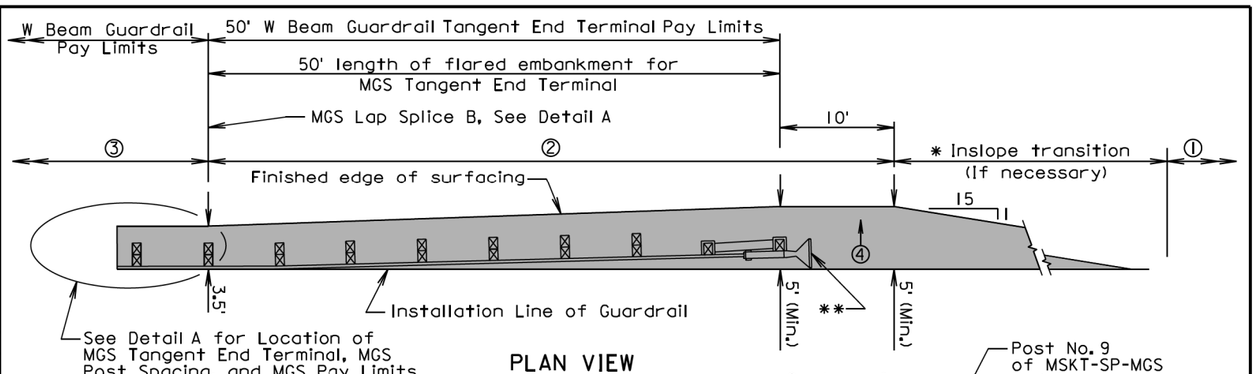
PLATE NUMBER 630.87

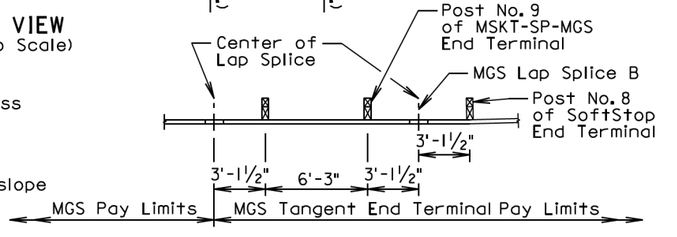
Sheet 1 of 1

Published Date: 2nd Qtr. 2018

SDDOT

EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR W BEAM GUARDRAIL TANGENT END TERMINAL AND MGS TANGENT END TERMINAL





** See Standard Plate 632.40 for delineation.

2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.

① Same inslope as mainline inslope.

② 4:1 inslope or flatter as specified in the plans. Inslope shall not be steeper than a 4:1 slope.

③ Inslope as specified in the plans.

④ Same slope as roadway cross slope or as specified in the plans. Slope shall not be steeper than a 10:1 slope.

GENERAL NOTES:

The tangent guardrail end terminal above is for illustrative purpose only.

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

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

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

February 14, 2017

PLATE NUMBER 630.88

Sheet 1 of 1

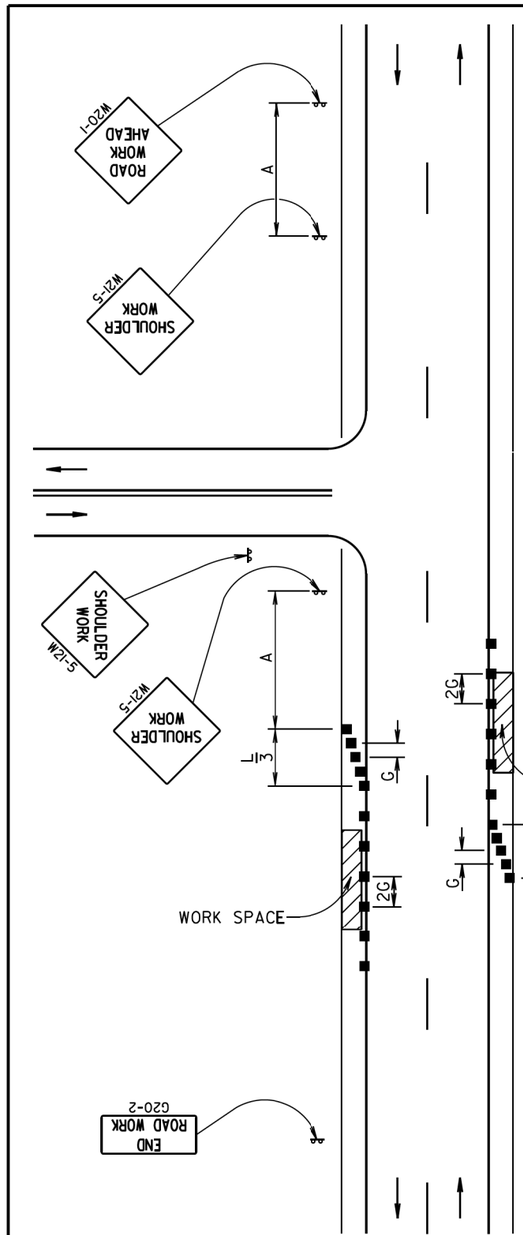
Plotting Date: 06/18/2018

STATE OF SOUTH DAKOTA

PROJECT 000I-469, 000N-469 & 000P-469

SHEET 20

TOTAL SHEETS 22



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

■ Channelizing Device

END ROAD WORK G20-2

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

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

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

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

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

June 3, 2016

Published Date: 2nd Qtr. 2018	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES WORK ON SHOULDERS	PLATE NUMBER 634.03
			Sheet 1 of 1

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

Flagger

■ Channelizing Device

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

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

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

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

The channelizing devices shall be drums or 42" cones.

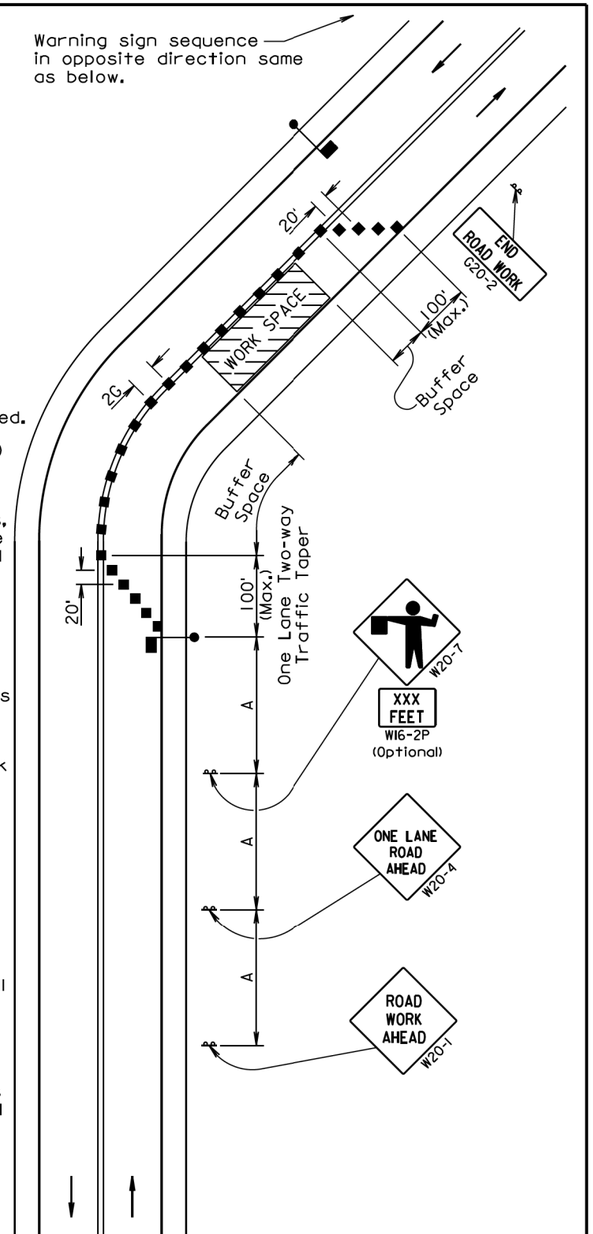
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.

END ROAD WORK G20-2

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

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

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



June 3, 2016

Published Date: 2nd Qtr. 2018	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-469, 000N-469 & 000P-469	22	22

Plotting Date: 06/18/2018

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

* Spacing is 40' for 42" cones.

◎ Reflectorized Drum

■ Channelizing Device

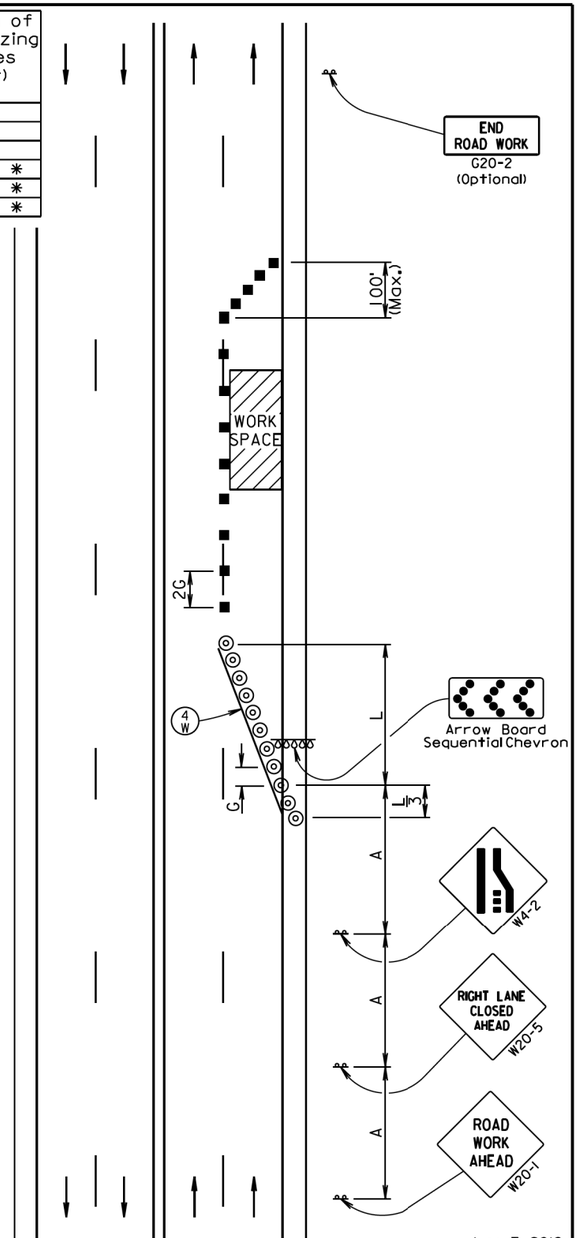
(4W) 4" White Temporary Pavement Marking

The channelizing devices 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 night time hours.

Temporary pavement markings shall be used if traffic control must remain overnight.

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



June 3, 2016

Published Date: 2nd Qtr. 2018	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES 4-LANE UNDIVIDED, RIGHT LANE CLOSED	PLATE NUMBER 634.47 Sheet 1 of 1

Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

◎ Reflectorized Drum

■ Channelizing Device

(4W) 4" White Temporary Pavement Marking

Temporary pavement markings shall be used if traffic control must remain overnight.

This procedure also applies when work is being performed in the lane adjacent to the median on a divided highway. Under these conditions, LEFT LANE CLOSED signs and the corresponding LANE REDUCTION symbol signs shall be used.

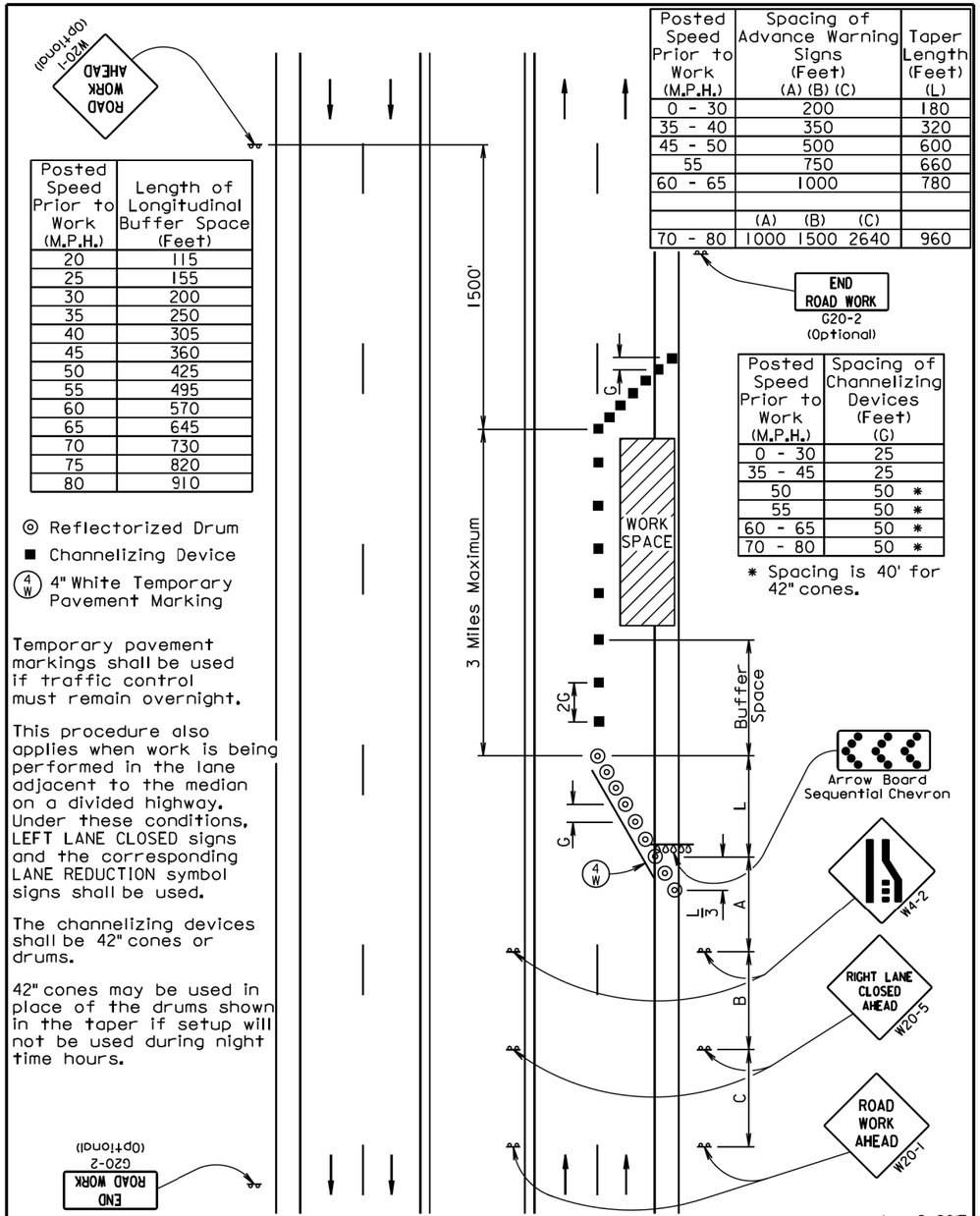
The channelizing devices shall be 42" cones or drums.

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

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)
0 - 30	200	180
35 - 40	350	320
45 - 50	500	600
55	750	660
60 - 65	1000	780
	(A) (B) (C)	
70 - 80	1000 1500 2640	960

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 45	25
50	50 *
55	50 *
60 - 65	50 *
70 - 80	50 *

* Spacing is 40' for 42" cones.



June 9, 2017

Published Date: 2nd Qtr. 2018	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITHOUT BARRIER	PLATE NUMBER 634.64 Sheet 1 of 1

Plot Scale - 1:200

Plotted From - trrc11951

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