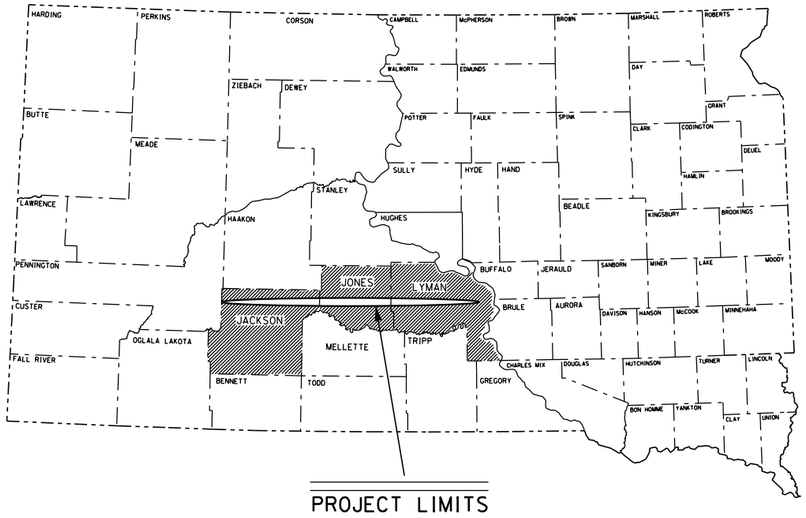
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-391	1	57

Plotting Date: 03/05/2018



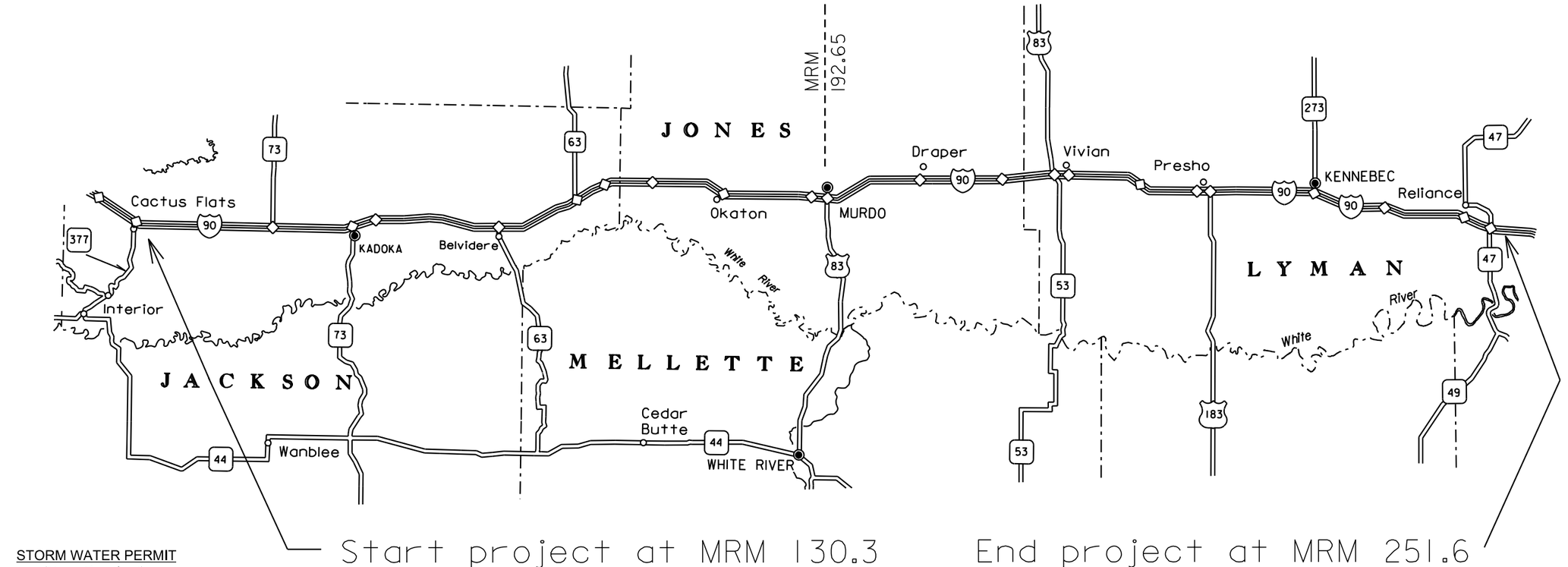
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

000I–391
INTERSTATE 90
JACKSON, JONES, & LYMAN COUNTIES

GUARDRAIL REPAIR AND/OR REPLACEMENT DUE TO DAMAGE ON INTERSTATE 90 FROM MRM 130.3 TO 251.6

PCN i4Y4

PLAN SHEET INDEX



Start project at MRM 130.3

End project at MRM 251.6

STORM WATER PERMIT
(None Required)

Plot Scale - 1:5000

- Plotted From - trwl1nt23

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ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0197	Mobilization 1	5	Each
009E0198	Mobilization 2	4	Each
110E0700	Remove 3 Cable Guardrail	200.0	Ft
110E0730	Remove Beam Guardrail	300.0	Ft
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	1	Each
110E0790	Remove W Beam Guardrail Deformed End	1	Each
110E0800	Remove W Beam Guardrail End Terminal	1	Each
110E6000	Remove 3 Cable Guardrail For Reset	25.0	Ft
110E6210	Remove Thrie Beam Guardrail For Reset	25.0	Ft
110E6230	Remove W Beam Guardrail for Reset	25.0	Ft
110E6300	Remove Rubrail For Reset	25.0	Ft
120E0600	Contractor Furnished Borrow Excavation	25	CuYd
260E1090	Base Course, State Furnished	25.0	Ton
629E0225	Reset High Tension Cable Guardrail Terminal Post	5	Each
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	1	Each
629E0400	3 Cable Guardrail Anchor Assembly	1	Each
629E0454	Retension High Tension 4 Cable Guardrail	2,000.0	Ft
629E1000	Repair 3 Cable Guardrail	4,000.0	Ft
629E1100	3 Cable Guardrail End Post	10	Each
629E1102	3 Cable Guardrail Intermediate Post	130	Each
629E1103	3 Cable Guardrail Slip Base Anchor Post	2	Each
629E1104	3 Cable Guardrail Post, Winter	75	Each
629E1106	Drive Down 3 Cable Guardrail Post	20	Each
629E1108	Reset 3 Cable Guardrail Post	25	Each
629E1110	Cable Anchor Bracket	1	Each
629E1112	Cable Splice	5	Each
629E1114	3 Cable Guardrail J Hook Bolt	400	Each
629E1117	Turnbuckle Assembly	5	Each
629E1118	Spring Cable End Assembly with Turnbuckle	10	Each
629E1120	W Beam to 3 Cable Transition Bracket	4	Each
629E1122	3 Cable Guardrail End Post Cap	7	Each
629E1144	High Tension 4 Cable Guardrail Post	20	Each
629E1159	High Tension 4 Cable Guardrail Post and Sleeve	5	Each
629E1164	High Tension 4 Cable Guardrail Sleeve	5	Each
629E1170	High Tension Cable Guardrail Terminal Post	5	Each
629E1174	Hardware for High Tension Cable Attachment to Terminal Post	5	Each
629E1175	Hardware for High Tension Cable Attachment to Post	40	Each
629E1180	High Tension Cable Guardrail Post Strap	15	Each
629E1181	High Tension Cable Guardrail Cable Spacer	15	Each

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
629E2115	Cable	50.0	Ft
630E0200	Straight Class A Thrie Beam Rail	100.0	Ft
630E0210	Straight Class B Thrie Beam Rail	50.0	Ft
630E1200	Straight Class A W Beam Rail	175.0	Ft
630E1210	Straight Class B W Beam Rail	100.0	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	2	Each
630E2001	Asymmetrical W Beam to Thrie Beam Guardrail Transition	1	Each
630E2010	W Beam Guardrail End Terminal	1	Each
630E2016	MGS Flared End Terminal	1	Each
630E2019	MGS Tangent End Terminal	1	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	1	Each
630E2055	Thrie Beam Guardrail Trailing End Terminal	1	Each
630E2060	W Beam Guardrail Trailing End Terminal	1	Each
630E2065	MGS Trailing End Terminal	1	Each
630E2110	Beam Guardrail Post and Block	60	Each
630E2120	Beam Guardrail Post and Block, Winter	15	Each
630E2205	Breakaway Cable Terminal End Post	5	Each
630E2210	Breakaway Cable Terminal End Rail	3	Each
630E2215	W Beam Guardrail End Section Buffer	2	Each
630E5120	Reset Thrie Beam Rail	25.0	Ft
630E5160	Reset W Beam Rail	25.0	Ft
630E5220	Reset Rubrail	25.0	Ft
630E5520	Drive Down Beam Guardrail Post	10	Each
630E5530	Remove and Reset Beam Guardrail Post and Block	10	Each
632E2220	Guardrail Delineator	10	Each
634E0010	Flagging	10.0	Hour
634E0110	Traffic Control Signs	1,298.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0280	Type 3 Barricade, 8' Single Sided	9	Each
634E0420	Type C Advance Warning Arrow Board	1	Each
910E1070	Labor and Equipment	5.0	Hour

ESTIMATE OF QUANTITIES

The Contractor shall furnish and install guardrail material as per the Contract Proposal. The quantities for each item are estimated to establish a pay unit. The actual amount of work required may vary greatly from the Estimate of Quantities. There will be no negotiation for overruns or underruns on this contract.

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

State Historical Preservation Office (SHPO or THPO) concurrence has not been obtained for this project.

Action Taken/Required:

All earth disturbing activities require a cultural resource review prior to scheduling the pre-construction meeting. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. 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 if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view of 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 will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. 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.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office to determine an appropriate course of action.

The Contractor is responsible for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMPLETION DATE

The contract will become effective on July 1, 2018 and will expire on June 15, 2019.

SCOPE OF WORK

This project consists of guardrail repair within the section of Interstate 90 located in the South Dakota Department of Transportation Winner Area, as ordered by the Engineer. This stretch of Interstate is located in Jackson, Jones, and Lyman Counties from MRM 130.3 to MRM 251.6. The Winner Area Engineer will inform the Contractor of any areas that are to be exempted from guardrail repair due to active construction projects. This information will detail the exemption limits from Mile Reference Marker to Mile Reference Marker and date to date that guardrail repair will not be conducted.

MOBILIZATION

Mobilization 1 is the cost of mobilization per each time the Contractor mobilizes to the project at the request of the Winner Area Engineer, or his designated representative, to perform guardrail repair within the Winner Area east of the bridge structure located on Highway 83 over Interstate 90 (Winner Area East of Murdo). This structure is located at MRM 192.65.

Mobilization 2 is the cost of mobilization per each time the Contractor mobilizes to the project at the request of the Winner Area Engineer, or his designated representative, to perform guardrail repair within the Winner Area, at or west of the bridge structure located on Highway 83 over Interstate 90 (Winner Area West of Murdo). This structure is located at MRM 192.65.

Mobilization will be paid once each time the Contractor is required to mobilize to repair guardrail, regardless of the number of sites requiring repair within the project limits. Mobilization will be paid at the higher of the two Mobilization bid items if the Contractor is required to repair guardrail at sites both east and west of the dividing line located at MRM 192.65.

PROGRESS PAYMENTS

At the preconstruction meeting the Contractor will be given a Billing Sheet to record the work done at the repair areas. This sheet shall be used by the Contractor to record the location of each repair site and the materials required to make repairs.

Progress payments will be prepared upon receipt of the Billing Sheet from the Contractor for repairs completed.

UTILITIES

The Contractor is required to comply with South Dakota Codified Law and Administrative Rule addressing excavation activities. Notification of Utility companies will be in accordance with Section 5.6 of the Specifications. South Dakota One Call phone number is 1-800-781-7474.

GENERAL MAINTENANCE OF TRAFFIC

The Contractor shall designate an employee whose primary responsibility is for the maintenance of traffic. The name and phone number of person or persons shall be provided to the SD Department of Transportation (605-842-0810), SD Highway Patrol State Radio (email to Jason.Husby@state.sd.us), the Jackson County Sheriff Department (605-837-2285), the Jones County Sheriff Department (605-669-7111), and the Lyman County Sheriff Department (605-869-2267).

The plan quantity for Traffic Control Signs is based on the Contractor mobilizing five times to repair guardrail and the required number of traffic control devices to construct one work zone for each mobilization. Additional traffic control devices will be measured and paid if the Contractor has a large enough crew to work at two work sites simultaneously. Signs that are reused at different sites during the same mobilization shall be paid for only once. Signs that have tabs or are hinged to expedite changing the message will be considered as one sign for payment. Traffic control signs and Type 3 barricades will be measured and paid each time the Contractor is mobilized to repair guardrail. The Type C Advance Warning Arrow Board, if used, shall be paid for only once for the time duration of this project.

Equipment will be confined to the shoulder, a driving lane closed to traffic, or a passing lane closed to traffic. Closure of both driving and passing lanes simultaneously will not be permitted. The Contractor shall not cross interstate medians to travel between work sites in opposite interstate lanes. Contractor employees will not be allowed to use the SDDOT maintenance crossovers.

Work activities shall be conducted during daylight hours only. Traffic shall be returned to the normal driving lanes during non-working hours. All construction operations shall be conducted in the general direction of traffic movement

All equipment and vehicles entering or exiting the roadway, traveling on the shoulders, traveling at speeds less than 40 MPH between work sites, or working within the right-of-way shall be equipped with an activated 360 degree, SAE J845, Class II or higher warning light to warn the traveling public.

Traffic control shall be in accordance with Section 634 of the specifications and the plan notes. All traffic control devices are to be in like new condition. Any traffic control device that warrants replacement due to its poor condition or absence shall be replaced immediately by the Contractor at the Contractor's expense.

Contractor shall use flaggers and 45 MPH Advisory Speed Plates as needed to regulate traffic to provide a safe working environment for Contractor workers and inspection personnel. The advisory speed plates (W13-1P) shall be 30" x 30" and shall be installed in conjunction with the "Right Lane Closed Ahead" (W20-5) signs as shown on Standard Plate 634.64. The flagger symbol sign (W20-7) shall be placed a minimum of 500 feet in front of the flagger station.

GENERAL GUARDRAIL REPAIR

The Contractor may be required to furnish some items that are not listed in the Contract Proposal. The Contractor shall furnish the invoice and will be paid invoice cost plus shipping, handling, taxes and 10 percent for profit. The Contractor is required to receive prior approval from the Engineer before making these purchases. Installation cost for these additional items shall be incidental to the contract unit prices for the various items. Cost to remove and dispose of damaged guardrail items shall be incidental to the contract unit prices for the various items. The Contractor and Engineer shall negotiate installation costs for added items which vary significantly from contract bid items.

HIGH TENSION GUARDRAIL

The following bid items shall be used when the Engineer directs the Contractor to repair High Tension 4 Cable Guardrail Systems. The primary expected repairs are listed in the table, followed by an explanation of each bid item.

Trinity Highway Products CASS-S3 4-Cable Guardrail Safety System will be repaired and reinstalled in accordance with manufacturer details and instructions shown in these plans.

High Tension Guardrail Bid Items

BID ITEM NUMBER	ITEM	PAYMENT INFO.	UNIT
629E0225	Reset High Tension Cable Guardrail Terminal Post	1	Each
629E0454	Retension High Tension 4 Cable Guardrail	2	Ft
629E1112	Cable Splice	3	Each
629E1117	Turnbuckle Assembly	4	Each
629E1144	High Tension 4 Cable Guardrail Post	5	Each
629E1159	High Tension 4 Cable Guardrail Post and Sleeve	6	Each
629E1164	High Tension 4 Cable Guardrail Sleeve	7	Each
629E1170	High Tension Cable Guardrail Terminal Post	8	Each
629E1174	Hardware For High Tension Cable Attachment To Terminal Post	9	Each
629E1175	Hardware For High Tension Cable Attachment To Post	10	Each
629E1180	High Tension Cable Guardrail Post Strap	11	Each
629E1181	High Tension Cable Guardrail Cable Spacer	12	Each
629E2115	Cable	13	Ft

High Tension Guardrail Bid Items
Payment Information Explanation

1. This item to be used when a terminal post needs to be reset if the cable was released after post was struck. Post needs to be in good working condition. Payment includes cost for resetting the terminal post including, hardware, tensioning cable, labor, equipment, and incidentals.

2. Payment includes cost for all labor and equipment to tension the high tension 4 cable guardrail to current specifications. Measurement shall be measured to the nearest foot from the center of anchor assembly to center of anchor assembly. For example: If the system utilizes four anchor footings in the anchor assembly, then the center of the anchor assembly would be centered between the second and third footing.

3. Bid item may be used for splicing high tension cable guardrail or low tension standard 3 cable guardrail. Payment for cable splice includes cost for cutting cable as necessary, furnishing and installing the cable splice, labor, equipment, and incidentals.

4. Bid item may be used for furnishing and installing turnbuckle assembly for high tension or low tension cable guardrail. This item is used for a typical repair if a turnbuckle is damaged and a new one needs to be installed. Payment for turnbuckle assembly includes cost for cutting the cable as necessary, furnishing and installing the turnbuckle assembly, labor, equipment, and incidentals.

5. Bid item may be used for furnishing and installing a high tension 4 cable guardrail post. This item is used for a typical repair if a high tension 4 cable guardrail post is damaged and a new one needs to be installed. Payment includes cost for furnishing and installing a high tension 4 cable guardrail post, new hardware, labor, equipment, and incidentals.

6. Bid item may be used for furnishing and installing a high tension 4 cable guardrail post and sleeve. This item is used for a typical repair if a high tension 4 cable guardrail post and sleeve is damaged and a new one needs to be installed. Payment includes cost for furnishing and installing a high tension 4 cable guardrail post and sleeve, new hardware, labor, equipment, and incidentals.

7. Bid item may be used for furnishing and installing a high tension 4 cable guardrail sleeve. This item is used for a typical repair if a high tension 4 cable guardrail sleeve is damaged and a new one needs to be installed. Payment includes cost for furnishing and installing a high tension 4 cable guardrail sleeve, new hardware, resetting post, labor, equipment, and incidentals.

8. Bid item may be used for furnishing and installing a high tension cable guardrail terminal post. This item is used for a typical repair if a high tension cable guardrail terminal post is damaged and a new one needs to be installed. Use this item even if there is only one terminal post for the anchorage system as some systems has a terminal post for every cable and have multiple footings and terminal posts depending on the number of cables. Payment includes cost for furnishing and installing a high tension cable guardrail terminal post, new hardware, labor, equipment, and incidentals.

9. Bid item may 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.

10. Bid item may 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 all attachments are damaged on a high tension 4 cable guardrail post then the quantity would be 4. Payment includes cost for furnishing and installing hardware for the high tension cable attachment to post, labor, equipment, and incidentals.

11. This bid item is specific to products from Trinity known as the CASS high tension cable barrier. Use this item when only the post strap needs to be replaced. This part would be included in the price of the post if a new post is needed. Payment includes cost for furnishing and installing the high tension cable guardrail post strap, labor, equipment, and incidentals.

12. This bid item is specific to products from Trinity known as the CASS high tension cable barrier. This part typically has white or yellow reflectorized delineation on it. Use this item when only the cable spacer needs to be replaced. This part would be included in the price of the post if a new post is needed. Payment includes cost for furnishing and installing the high tension cable guardrail cable spacer, labor, equipment, and incidentals.

13. This bid item will be used for furnishing and installing cable for high tension (prestretched) or low tension (prestretched or non-pre-stretched) cable guardrail for a typical repair if a cable is damaged and a new piece needs to be installed. Payment for each cable includes cost for cutting the cable as necessary, furnishing and installing the cable, labor, equipment, and incidentals.

GUARDRAIL

1. When guardrail adjoining bridge ends is ordered to be repaired, the contractor will replace with the same size and type as existing type of guardrail. Post spacing will be in accordance with current specifications. See Standard Plates 630.50, 630.51, 630.52, 630.53, 630.54, 630.55, 630.60, 630.61, and 630.63 for post spacing and post length requirements.

2. When the SDDOT instructs the Contractor to replace a W Beam guardrail end terminal, the new W Beam guardrail end terminal shall be of the same type (flared or tangent) that was originally installed. The costs for furnishing and installing the tangent and flared W Beam guardrail end terminals shall be incidental to the contract unit price per each for "W Beam Guardrail End Terminal". All W Beam guardrail end terminals that are replaced shall meet the minimum Test Level 3 requirements of NCHRP Report Number 350 or the Manual for Assessing Safety Hardware (MASH) 2009 and shall be listed on the South Dakota Department of Transportation Approved Product List.

3. If the ground condition at the site is frozen or has large snow amounts, the portion of embankment and surfacing modification that does not affect guardrail installation or performance will be completed as soon as conditions permit, prior to contract completion date.

4. "Beam Guardrail Post and Block, Winter" is the additional cost for removal and installation of guardrail posts when there is in excess of one foot of solid frozen ground at the work site. This contract unit price will be an additional payment for each post installed under these conditions.

5. "3 Cable Guardrail Post, Winter" is the additional cost for removal and installation of a 3 Cable Guardrail Post (I Beam or Flanged Channel) when there is in excess of one foot solid frozen ground at the work site. This contract unit price will be an additional payment for each post installed under these conditions.

6. "Remove and Reset Beam Guardrail Post & Block" includes removal of wood guardrail post and block and resetting it to proper alignment with the Beam Guardrail. Payment for this work will be the same in frozen or unfrozen ground.

7. "Repair 3 Cable Guardrail" includes the cost for replacing and repairing damaged cable, realigning posts, and the tensioning of the entire run of three cable guardrail. Payment for this item is applicable only when broken cable is repaired or the existing cable rail requires realigning and tensioning.

8. "3 Cable Guardrail Intermediate Post" includes the cost for both I Beam and Flanged type of posts. The post for this item shall be furnished and installed consistent with the type of posts presently in place at the proposed repair site.

9. "Beam Guardrail Post and Block" shall include the appropriate size wood block. Typical block sizes are 6”x8”x14”, 6”x8”x19”, 6”x8”x21.75”, 6”x12”x14”, and 6”x12”x19”. The Engineer shall designate the proper post length of six, six and one-half, seven, or seven and one-half feet as needed to fit the repair situation.

GUARDRAIL (CONTINUED)

10. The Contractor shall place state furnished granular material or asphalt mix and granular base material around the posts to fill and level any voids created by the driving of the posts through the asphalt, or an alternate material as approved by the Engineer. This material will be available at the SDDOT Murdo Maintenance Yard. The material shall be placed ½" to 1" high around the post to force the water to drain away from the post. See Standard Plate 630.96 for guardrail post backfill requirements.

11. The Contractor shall replace any damaged guardrail delineation which cannot be repaired by bolting/riveting to new posts or guardrail installed by Contractor. See Standard Plate 632.40 for guardrail delineation requirements. The "Guardrail Delineator" bid item will be used to compensate the contractor for this work.

MIDWEST GUARDRAIL SYSTEM

Midwest Guardrail Systems are being installed at locations within the project limits of this contract during the summer of 2018 and repair of this guardrail system may be necessary during this contract period. Standard Plates 630.20, 630.22, 630.25, 630.27, 630.49, 630.50, 630.51, 630.54, 630.82, 630.87, and 630.88 will be used for this repair work. The Contractor shall replace any damaged MGS end terminals with an approved system from the SDDOT Approved Product List. Currently, the approved systems for MGS Flared End Treatment are Road Systems Inc. FLEAT-SP-MGS and Trinity Highway Products LLC SRT-31 (6 Post). The approved systems for MGS Tangent End Terminal are Road Systems Inc. MSKT-MASH Sequentially Kinking Terminal and Trinity Highway Products LLC SOFT-STOP.

LABOR AND EQUIPMENT

The Contractor may be required to clean out snow from around the guardrail and posts during the winter period. All costs to remove snow away from the work area necessary to complete the requested guardrail repair work, including labor, equipment, and incidentals shall be incidental to the contract unit price per hour for Labor and Equipment.

BASE COURSE, STATE FURNISHED

The Contractor may be required to install Base Course, State Furnished on this project. This base course shall be compacted to the satisfaction of the Engineer.

Base Course, State Furnished will be available from the SDDOT Maintenance Yards located at:
Kadoka, legal description of NW1/4, Section 32, T2S, R21E; (Exit 150);
Murdo, legal description of NE1/4, Section 13, T2S, R28E; (Exit 192);
and Reliance, legal description of SW1/4, Section 35, T105N, R73W; (Exit 250). This material can be used without testing.

The Base Course, State Furnished is royalty free to the Contractor.

The final quantity to be paid will be based on loose volume of cubic yards hauled in each truckload. All costs for placement of base material shall be incidental to the contract unit price per ton for "Base Course, State Furnished".

All other requirements of the specifications for Base Course shall apply.

This project will use a conversion factor of 1.5 ton per cubic yard for this material.

STATE FURNISHED GUARDRAIL POST BACKFILL MATERIAL

The Contractor will be required to place state furnished granular material, or asphalt mix and granular base material on this project around the guardrail posts to ensure proper drainage. See Standard Plate 630.96 for guardrail post backfill requirements.

The backfill materials are located in the SDDOT Maintenance Yard located at Murdo, legal description of NE1/4, Section 13, T2S, R28E; (Exit 192). This material is royalty free to the Contractor.

Placement of this material will be incidental to the related bid items for this contract.

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor shall provide a suitable site for Contractor furnished borrow material. The borrow material shall be approved by the Engineer. The final quantity to be paid will be based on loose volume of cubic yards hauled in each truckload. All costs for placements of borrow material shall be incidental to the contract unit price per cubic yard for "Contractor Furnished Borrow Excavation". Compaction of borrow material shall be to the satisfaction of the Engineer. The Contractor is responsible for obtaining all required permits and clearances for the borrow site.

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

RESTORATION OF DISTURBED AREAS

Areas disturbed as a result of work necessary under this Contract shall be reshaped and/or restored to the satisfaction of the Engineer.

Slopes and berms disturbed shall be leveled and excess material removed. Area shall be tilled to the minimum depth of three inches and seeded with Intermediate Wheatgrass (Oahe) at the rate of one-half (1/2) pound "Pure Live Seed" per 1000 square feet. The seed shall be noxious weed free. Cost for reshaping, leveling, removal of excess material, tilling, and seeding disturbed areas on the slopes and berms shall be incidental to the contract unit price for the various items.

ITEMIZED LIST OF TRAFFIC CONTROL DEVICES

		000I-391 PCN i4Y4			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W7-3aP	NEXT __ MILES (plaque)	2	36" x 30"	7.5	15.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	3	48" x 48"	16.0	48.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	3	48" x 24"	8.0	24.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			259.6

TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY	
Type 3 Barricade, 8' Single Sided	9	Each

ARROW BOARDS

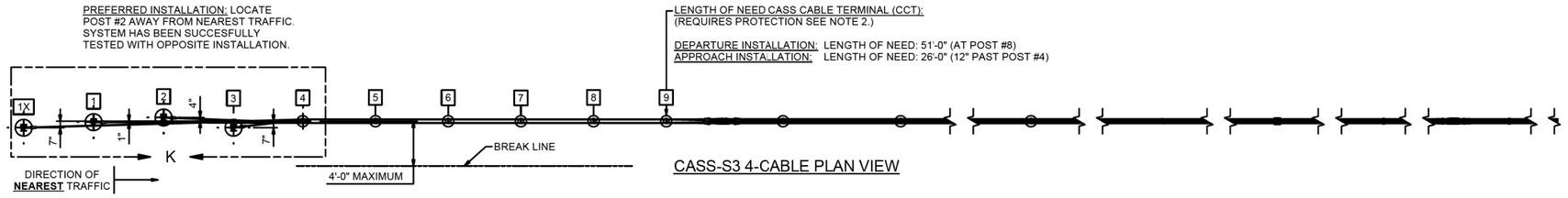
ITEM DESCRIPTION	QUANTITY	
Type C Advance Warning Arrow Board	1	Each

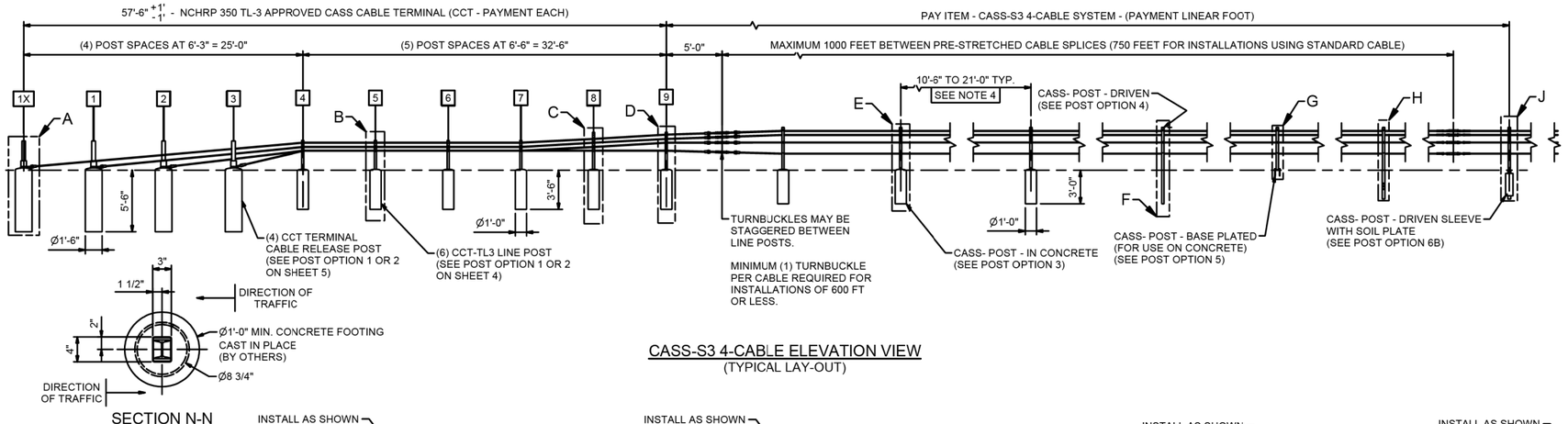
TRINITY HIGHWAY PRODUCTS CASS-S3 4-CABLE GUARDRAIL SAFETY SYSTEM

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-391	8	57

Plotting Date: 03/05/2018

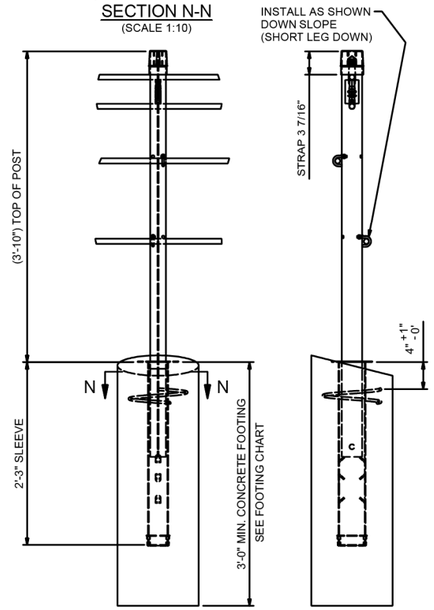
Plot Scale - 1:200



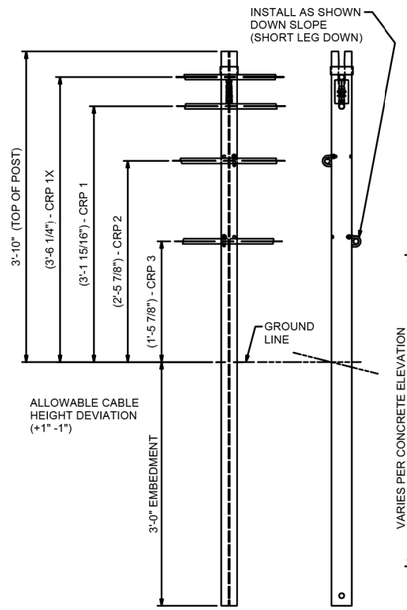


CASS-S3 4-CABLE ELEVATION VIEW
(TYPICAL LAY-OUT)

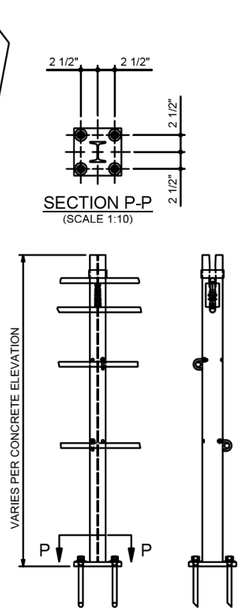
SECTION N-N
(SCALE 1:10)



DETAIL E
(CASS POST IN CONCRETE)
(POST OPTION #3 SHOWN)

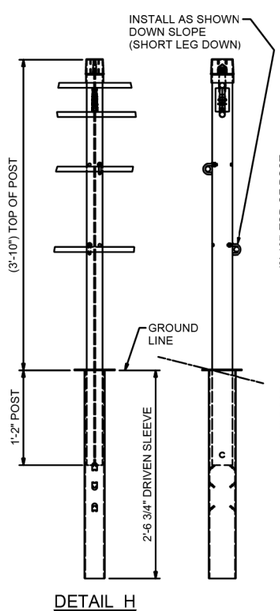


DETAIL F
(CASS POST - DRIVEN)
(POST OPTION #4 SHOWN)

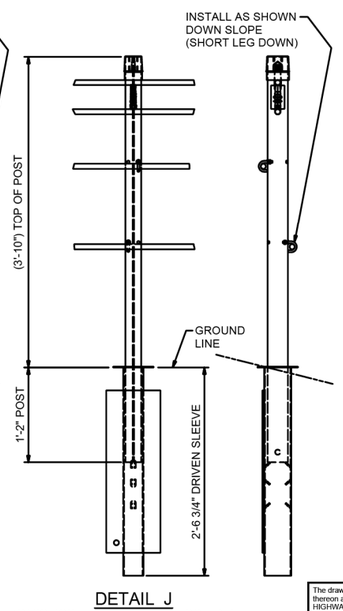


SECTION P-P
(SCALE 1:10)

DETAIL G
(CASS POST - BASE-PLATED)
(POST OPTION #5 SHOWN)



DETAIL H
(CASS POST - DRIVEN SLEEVE)
(POST OPTION #6A SHOWN)



DETAIL J
(CASS POST DRIVEN SLEEVE - SOIL PLATE)
(POST OPTION #6B SHOWN)

NOTES:

1. CASS-S3 4-CABLE (4:1) HAS BEEN SUCCESSFULLY TESTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 **TEST LEVEL 3** (NCHRP 350 TL3) **WHEN INSTALLED ON A 4:1 OR FLATTER SLOPE**. CASS-S3 4-CABLE (4:1) HAS BEEN SUCCESSFULLY TESTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 **TEST LEVEL 4** (NCHRP 350 TL4) **WHEN INSTALLED ON A 6:1 OR FLATTER SLOPE**. THIS CABLE BARRIER SYSTEM HAS BEEN ASSIGNED FHWA ACCEPTANCE LETTER NUMBER B-141F. AS OF JANUARY 12TH, 2010, IT IS CONSIDERED "FHWA ACCEPTANCE PENDING", FOR VARIOUS POST SPACINGS.

2. CASS CABLE TERMINAL (CCT) HAS BEEN SUCCESSFULLY TESTED AND ACCEPTED TO NCHRP TL3. AN NCHRP 350 TL3 APPROVED TERMINAL (CCT) OR CASS-S3 4-CABLE (4:1) TRANSITION (VARIOUS) SHALL BE USED ON APPROACH AND DEPARTURE TERMINATIONS WHEN CASS-S3 4-CABLE (4:1) IS INSTALLED ON THE NATIONAL HIGHWAY SYSTEM (NHS). IF THE TERMINATION POINT IS LOCATED OUTSIDE THE CLEAR ZONE AND/OR PROTECTED BY OTHER MEANS (CRASHWORTHY BARRIER, TERMINALS, ETC.), A NON-NCHRP 350 TL3 ANCHOR (CCA) MAY BE USED ON APPROACH AND DEPARTURE TERMINATIONS.

3. CASS-S3 4-CABLE (4:1) SHALL BE INSTALLED ON SHOULDERS OR MEDIANS WITH SLOPES OF 4:1 OR FLATTER WITHOUT OBSTRUCTIONS, DEPRESSIONS, ETC. THAT MAY SIGNIFICANTLY AFFECT THE STABILITY OF AN ERRANT VEHICLE. **CASS-S3 4-CABLE (4:1) MUST BE INSTALLED A MAXIMUM OF FOUR (4) FEET FROM THE BREAK POINT**. GRADING OF SITE AND/OR APPROPRIATE FILL MATERIALS MAY BE REQUIRED. THE DESIGNER/INSTALLER SHALL "FLATTEN" OR "ROUND" VARIOUS TOPOGRAPHICAL INCONSISTENCIES THAT COULD INTERFERE WITH THE ABILITY OF THE INSTALLER TO CONSISTENTLY MAINTAIN THE DESIGN HEIGHT (IN RELATION TO THE TERRAIN) OF THE CABLES. PLEASE CONSULT THE CASS MANUAL(S) FOR INSTALLATIONS IN "DITCH SECTIONS".

4. CASS-S3 4-CABLE (4:1) POST SPACING MAY BE MODIFIED TO AVOID OBSTACLES THAT CONFLICT WITH THE INSTALLATION OF CASS-S3 4-CABLE (4:1) LINE POSTS. NO POST SPACE CAN EXCEED THE MAXIMUM POST SPACE LIMIT OF 21'-0", OR MAXIMUM POST SPACING ALLOWED BY PROJECT ENGINEER - WHICHEVER IS LESS. REDUCING OR INCREASING POST SPACING AFFECTS DEFLECTION. CASS-S3 4-CABLE (4:1) MAY BE LATERALLY TRANSFERRED AT A RATE NOT TO EXCEED 30:1.

5. POST FOUNDATIONS MAY BE DRILLED THROUGH EXISTING PAVEMENT. TRINITY MAY ALLOW THE USE OF ALTERNATE LINE POST FOOTINGS IF SYSTEM IS INSTALLED WITH AN ACCEPTABLE MOWSTRIP APPLICATION - PLEASE CONTACT TRINITY.

6. **FOR AESTHETIC PURPOSES** TRINITY RECOMMENDS ALL SLEEVES, DRIVEN POSTS, AND LOWER CABLE RELEASE POSTS TO BE INSTALLED REASONABLY PLUMB (APPROXIMATELY 1/8" PER FOOT).

7. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 P.S.I. PRIOR TO TENSIONING THE SYSTEM. TRINITY RECOMMENDS THE CONCRETE TO BE VIBRATED IN ACCORDANCE WITH THE LATEST APPLICABLE AGENCY SPECIFICATION.

8. CASS-S3 4-CABLE (4:1) SHALL BE INSTALLED IN WELL-DRAINED, COMPACTED, NCHRP REPORT 350 STANDARD SOILS. IF SOIL DOESN'T MEET THIS CLASSIFICATION, IF SOLID ROCK/CONCRETE IS ENCOUNTERED BELOW GRADE OR IF SOIL IS SUSCEPTABLE TO SEVERE FREEZE/THAW CYCLES, PLEASE CONTACT TRINITY ABOUT ALTERNATE FOOTING DESIGN(S). TRINITY SUGGESTS THE USE OF "MOW STRIPS" FOR EROSION PREVENTION AND EASE OF MAINTENANCE / INSTALLATION.

9. PLEASE SEE SPECIFYING AGENCY (OR MUTCD) FOR PROPER "BARRIER" DELINEATION.

10. PLEASE CONTACT TRINITY OR CONSULT THE DESIGN, INSTALLATION, OR REPAIR MANUAL(S) FOR ADDITIONAL INFORMATION.

TRINITY HIGHWAY PRODUCTS, LLC. EMAIL:
2525 STEMMONS FREEWAY PRODUCT.INFO@TRIN.NET
DALLAS, TX 75207 PHONE: (800) 644-7976

OPTION	CASS-TL3-S3 POST OPTIONS
1	CCT - TERMINAL POST 1 - 9 - IN CONCRETE
2	CCT -TERMINAL POST 1 - 9 - WITH SOIL PLATE
3	CASS-S3 POST - IN CONCRETE
4	CASS-S3 POST - DRIVEN
5	CASS-S3 POST - BASE-PLATED
6	CASS-S3 POST - IN DRIVEN SLEEVE
	6A - DRIVEN SLEEVE - WITH NOTCH
	6B - DRIVEN SLEEVE - WITH SOIL PLATE

PROJ. CASS-S3

CASS-S3 (4:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY PRODUCTS, LLC

SPEC:	
SHIPPING WT:	
DRW: E.A.S.	1/25/2010
CHK: G.N.	1/25/2010
SHT: 1 OF 5	SIZE: D
DWG NO: SS-742	REV 0

file: SS-742_TL3_S3_4T1_4C.idw

- Plotted From - tnvi1nt23

File - ...\Working\CASS SS743.dgn

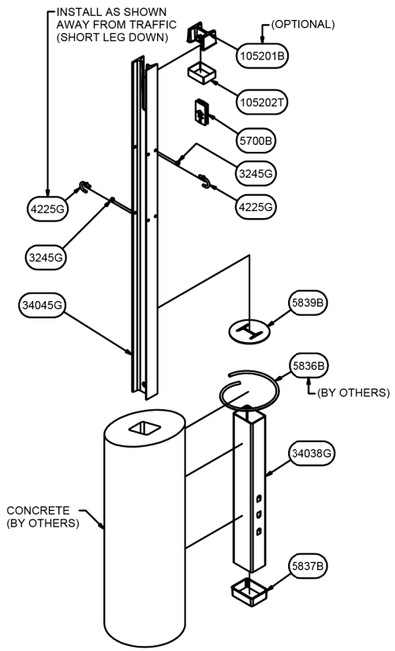
TRINITY HIGHWAY PRODUCTS CASS-S3 4-CABLE GUARDRAIL SAFETY SYSTEM

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-391	9	57

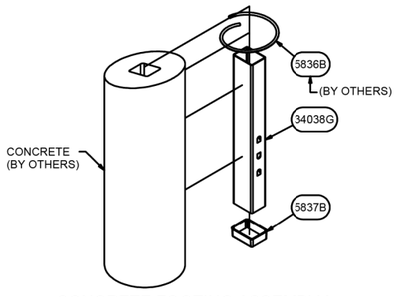
Plotting Date: 03/05/2018

Plot Scale - 1:200

PARTS LIST - CASS-S3 POST - IN CONCRETE - POST OPTION #3			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 DIA. HEX NUT (A563)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
1	5700B	CASS & TL3 CABLE SPACER	0.11
1	5836B	CONCRETE REINFORCING RING	0.88
1	5837B	SLEEVE CAP - CASS-TERMINAL POST	0.12
1	5839B	SLEEVE COVER - S3 POST	0.11
1	34038G	27" POST SLEEVE - IN CONCRETE	12.19
1	34045G	CASS-S3 POST - SHORT	28.06
1	105201B	CASS-S3 POST CAP	0.13
1	105202T	CASS-S3 - POST STRAP	0.19



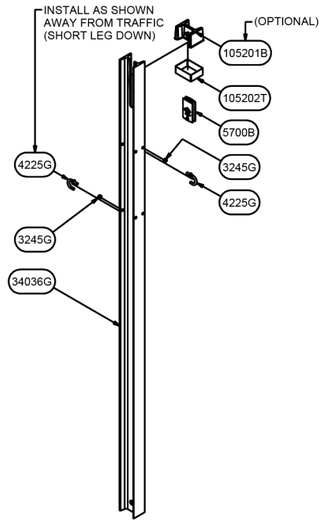
CASS-S3 POST - IN CONCRETE
(POST OPTION #3 - CAST IN PLACE)



CONCRETE FOOTING ASSEMBLY
(POST OPTION #3 - PRE-CAST OPTION)

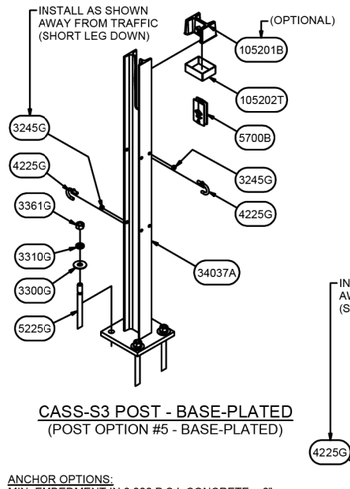
PARTS LIST - PRE-CAST CONCRETE FOOTING - OPTION #3			
QTY	PART No	TITLE	Lbs / Each
1	5836B	CONCRETE REINFORCING RING	0.88
1	5837B	SLEEVE CAP - CASS-TERMINAL POST	0.12
1	34038G	27" POST SLEEVE - IN CONCRETE	12.19

PARTS LIST - CASS-S3 POST DRIVEN - OPTION #4			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 DIA. HEX NUT (A563)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
1	5700B	CASS & TL3 CABLE SPACER	0.11
1	34036G	CASS-S3 POST - LONG	38.51
1	105201B	CASS-S3 POST CAP	0.13
1	105202T	CASS-S3 - POST STRAP	0.19



CASS-S3 POST - DRIVEN
(POST OPTION #4 - DRIVEN)

PARTS LIST - CASS-S3 POST BASE-PLATED - OPTION #5			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 DIA. HEX NUT (A563)	0.01
4	3300G	5/8" PLAIN WASHER - TYPE B - R - (F844)	0.06
4	3310G	5/8 LOCK WASHER	0.00
4	3361G	5/8" HEX NUT (A563 Gr DH)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
4	5225G	5/8 x 7 1/2" HAS SUPER ROD CHSL PT (A193 B7)	0.62
0.6	5448B	HIT HY 150 MAX EPOXY (HILTI - 00283548)	
1	5700B	CASS & TL3 CABLE SPACER	0.11
1	34037A	CASS-TL3 POST BASE-PLATED	29.52
1	105201B	CASS-S3 POST CAP	0.13
1	105202T	CASS-S3 - POST STRAP	0.19



CASS-S3 POST - BASE-PLATED
(POST OPTION #5 - BASE-PLATED)

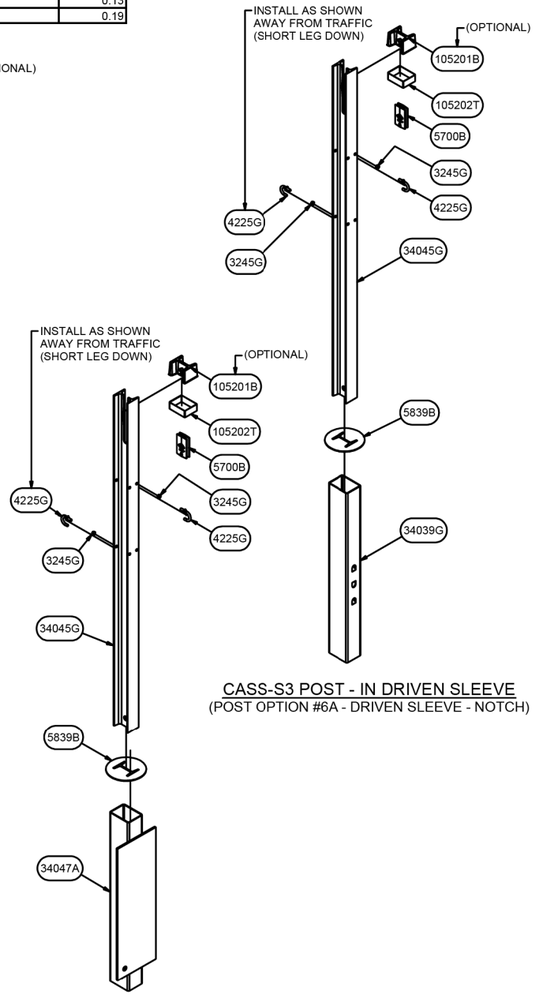
ANCHOR OPTIONS:
MIN. EMBEDMENT IN 3,000 P.S.I. CONCRETE = 6".
MIN. PULLOUT STRENGTH = 10,000 lbs.

1: 5/8 ADHESIVE ANCHORING SYSTEM.
(4 EACH 3300G, 3310G, 3361G & 5225G) & 0.6 EACH 5448B

2: 5/8 x 8" ALL THREADED ROD (A449) WITH EPOXY.
(4 EACH 3300G, 3310G, 3361G & 6722G) & 0.6 EACH 5448B

3: 5/8 MECHANICAL ANCHOR. (BY OTHERS)

PARTS LIST - CASS-S3 POST - IN DRIVEN SLEEVE - POST OPTION			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 DIA. HEX NUT (A563)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
1	5700B	CASS & TL3 CABLE SPACER	0.11
1	5839B	SLEEVE COVER - S3 POST	0.11
1	34039G	27" POST SLEEVE - DRIVEN	13.87
1	34045G	CASS-S3 POST - SHORT	28.06
1	105201B	CASS-S3 POST CAP	0.13
1	105202T	CASS-S3 - POST STRAP	0.19



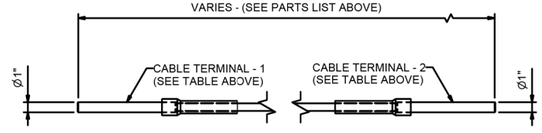
CASS-S3 POST - IN DRIVEN SLEEVE
(POST OPTION #6A - DRIVEN SLEEVE - NOTCH)

PARTS LIST - CASS-S3 POST - IN DRIVEN SLEEVE - POST OPTION #6B			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 DIA. HEX NUT (A563)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
1	5700B	CASS & TL3 CABLE SPACER	0.11
1	5839B	SLEEVE COVER - S3 POST	0.11
1	34045G	CASS-S3 POST - SHORT	28.06
1	34047A	30.75" CASS-S3 POST SLEEVE w/ SOIL PLATE	27.47
1	105201B	CASS-S3 POST CAP	0.13
1	105202T	CASS-S3 - POST STRAP	0.19

PARTS LIST - PRE-STRETCHED CABLE ASSEMBLIES						
QTY	PART No	TITLE	LENGTH	TERM-1	TERM-2	Lbs / Each
1	5817	CCT CABLE ASSEMBLY-TOP	54'-4"	R.H.T.	L.H.T.	58.3
1	5818	CCT CABLE ASSEMBLY-MID	48'-1"	R.H.T.	L.H.T.	52.3
1	5819	CCT CABLE ASSEMBLY-BOT	41'-10"	R.H.T.	L.H.T.	46.3
1	5867	CCA CABLE ASSEMBLY	25'-0"	R.H.T.	L.H.T.	30.9
1	5816	CABLE ASSEMBLY-INTERIOR	1000'	R.H.T.	L.H.T.	967.0
1	5753	CABLE FIELD SPLICE SECTION	1025'	R.H.T.	NONE	989.0
1	5752	CABLE FIELD SPLICE SECTION	1000'	R.H.T.	NONE	965.0
1	5798	CABLE FIELD SPLICE SECTION	975'	R.H.T.	NONE	940.9
1	5797	CABLE FIELD SPLICE SECTION	950'	R.H.T.	NONE	916.9
1	5796	CABLE FIELD SPLICE SECTION	925'	R.H.T.	NONE	892.8
1	5795	CABLE FIELD SPLICE SECTION	900'	R.H.T.	NONE	868.8
1	5794	CABLE FIELD SPLICE SECTION	875'	R.H.T.	NONE	844.7
1	5793	CABLE FIELD SPLICE SECTION	850'	R.H.T.	NONE	820.7
1	5792	CABLE FIELD SPLICE SECTION	825'	R.H.T.	NONE	796.6
1	5791	CABLE FIELD SPLICE SECTION	800'	R.H.T.	NONE	772.6
1	5790	CABLE FIELD SPLICE SECTION	775'	R.H.T.	NONE	748.5
1	5789	CABLE FIELD SPLICE SECTION	750'	R.H.T.	NONE	724.5
1	5788	CABLE FIELD SPLICE SECTION	725'	R.H.T.	NONE	700.4
1	5787	CABLE FIELD SPLICE SECTION	700'	R.H.T.	NONE	676.4
1	5786	CABLE FIELD SPLICE SECTION	675'	R.H.T.	NONE	652.3
1	5785	CABLE FIELD SPLICE SECTION	650'	R.H.T.	NONE	628.3
1	5784	CABLE FIELD SPLICE SECTION	625'	R.H.T.	NONE	604.2
1	5783	CABLE FIELD SPLICE SECTION	600'	R.H.T.	NONE	580.2
1	5782	CABLE FIELD SPLICE SECTION	575'	R.H.T.	NONE	556.1
1	5781	CABLE FIELD SPLICE SECTION	550'	R.H.T.	NONE	532.1
1	5780	CABLE FIELD SPLICE SECTION	525'	R.H.T.	NONE	508.0
1	5779	CABLE FIELD SPLICE SECTION	500'	R.H.T.	NONE	484.0
1	5778	CABLE FIELD SPLICE SECTION	475'	R.H.T.	NONE	459.9
1	5776	CABLE FIELD SPLICE SECTION	450'	R.H.T.	NONE	435.9
1	5775	CABLE FIELD SPLICE SECTION	425'	R.H.T.	NONE	411.8
1	5769	CABLE FIELD SPLICE SECTION	400'	R.H.T.	NONE	387.8
1	5768	CABLE FIELD SPLICE SECTION	375'	R.H.T.	NONE	363.7
1	5767	CABLE FIELD SPLICE SECTION	350'	R.H.T.	NONE	339.7
1	5766	CABLE FIELD SPLICE SECTION	325'	R.H.T.	NONE	315.7
1	5765	CABLE FIELD SPLICE SECTION	300'	R.H.T.	NONE	291.6
1	5764	CABLE FIELD SPLICE SECTION	275'	R.H.T.	NONE	267.6
1	5763	CABLE FIELD SPLICE SECTION	250'	R.H.T.	NONE	243.5
1	5762	CABLE FIELD SPLICE SECTION	225'	R.H.T.	NONE	219.5
1	5761	CABLE FIELD SPLICE SECTION	200'	R.H.T.	NONE	195.4
1	5760	CABLE FIELD SPLICE SECTION	175'	R.H.T.	NONE	171.4
1	5759	CABLE FIELD SPLICE SECTION	150'	R.H.T.	NONE	147.3
1	5758	CABLE FIELD SPLICE SECTION	125'	R.H.T.	NONE	123.3
1	5757	CABLE FIELD SPLICE SECTION	100'	R.H.T.	NONE	99.2
1	5756	CABLE FIELD SPLICE SECTION	75'	R.H.T.	NONE	75.2
1	5755	CABLE FIELD SPLICE SECTION	50'	R.H.T.	NONE	51.1
1	5754	CABLE FIELD SPLICE SECTION	25'	R.H.T.	NONE	27.1
1	5840	CABLE FIELD REPAIR SECTION	5'	R.H.T.	L.H.T.	10.8

NOTE:

FOR THE STANDARD FIELD SPLICE SECTIONS ABOVE,
SUPPLY (1) RIGHT HAND THREADED STUD ASSEMBLY
5910G EACH.



PRE-STRETCHED CABLE ASSEMBLY

NOTES:

1. IN LIEU OF BLACK SPACER 5700B SUPPLY YELLOW REFLECTIVE SPACER 5701B OR WHITE REFLECTIVE SPACER 5702. (AS REQUIRED PER PROJECT PLANS)

2. IF INTERFERENCE OCCURS BETWEEN THE CABLE SPLICE AND CASS-TL3 POST, SUPPLY A SPLICE INTERFERENCE POST AND SUPPORT THE TURNBUCKLE ASSEMBLY TO THE CASS-TL3 POST BY USE OF A MODIFIED STRAP (5707T) AND 5/16" HARDWARE (4211G BOLT, 3245G NUT). CONTACT TRINITY FOR DETAILS. LONG SPLICE POST 34041G IN LIEU OF LONG CASS-TL3 (4:1) POST 34012G SHORT SPLICE POST 34040G IN LIEU OF SHORT CASS-TL3 (4:1) POST 34007G

3. IF REQUIRED PER PROJECT PLANS SUPPLY:
CABLE PULLING TOOL 5850B
CABLE TENSION METER 5878B
CABLE THERMOMETER 5709B

PROJ. CASS-S3

CASS-S3 (4:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY PRODUCTS, LLC

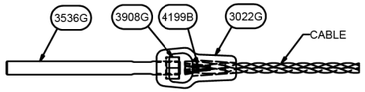
SPEC:		
SHIPPING WT:		
DRW:	E.A.S.	1/25/2010
CHK:	G.N.	1/25/2010
SHT: 2 OF 5	SIZE:	D
DWG NO: SS-742	REV	0

- Plotted From - trvl1nt23
file: SS-742_TL3_S3_4TT_4C.dgn
File - ...\Working\CASS SS743.dgn

TRINITY HIGHWAY PRODUCTS CASS-S3 4-CABLE GUARDRAIL SAFETY SYSTEM

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-391	10	57

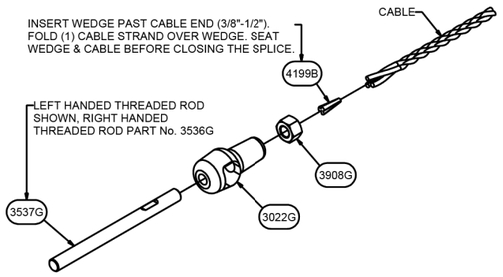
Plotting Date: 03/05/2018



1" CABLE FIELD SPLICE - 5909G & 5910G

(5910G SHOWN, 5909G SIMILAR)

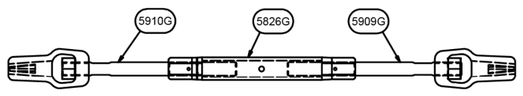
PARTS LIST - 5910G			
QTY	PART No	TITLE	Lbs / Each
1	3022G	1" CABLE END CASTING	0.56
1	3536G	1" STUD FLATTENED - R.H.T.	2.88
1	3908G	1" HEAVY HEX NUT (A563 DH)	0.47
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08



ASSEMBLY - 1" CABLE FIELD SPLICE - 5909G

(5909G SHOWN, 5910G SIMILAR)

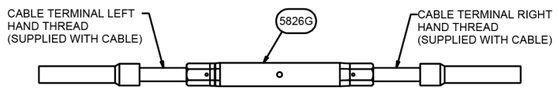
PARTS LIST - 5909G			
QTY	PART No	TITLE	Lbs / Each
1	3022G	1" CABLE END CASTING	0.56
1	3537G	1" STUD FLATTENED - L.H.T.	2.88
1	3908G	1" HEAVY HEX NUT (A563 DH)	0.47
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08



1" CABLE SPLICE - 5633G

(CLOSED BODY STYLE)

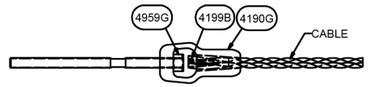
PARTS LIST - 5633G			
QTY	PART No	TITLE	Lbs / Each
1	5826G	1" CASS TURNBUCKLE CLOSED BODY STYLE	4.81
1	5909G	1" STUD ASSEMBLY L.H.T.	3.99
1	5910G	1" STUD ASSEMBLY R.H.T.	3.99



1" TURNBUCKLE - 5826G

(CLOSED BODY STYLE)

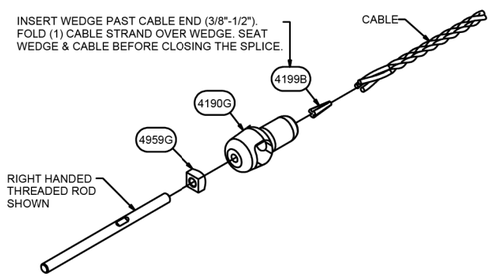
PARTS LIST - 5826G			
QTY	PART No	TITLE	Lbs / Each
1	5826G	1" CASS TURNBUCKLE CLOSED BODY STYLE	4.81



3/4" CABLE FIELD SPLICE - 5634G & 5635G

(5634G SHOWN, 5635G SIMILAR)

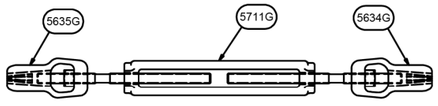
PARTS LIST - 5634G			
QTY	PART No	TITLE	Lbs / Each
1	105204G	3/4" STUD FLATTENED - L.H.T.	1.62
1	4190G	CABLE END CASTING	3.78
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08
1	4959G	3/4" HEAVY SQUARE NUT (A563)	0.26



ASSEMBLY - 3/4" CABLE FIELD SPLICE - 5635G

(5635G SHOWN, 5634G SIMILAR)

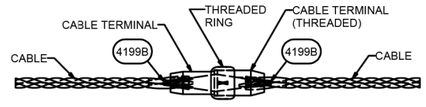
PARTS LIST - 5635G			
QTY	PART No	TITLE	Lbs / Each
1	105205G	3/4" STUD FLATTENED - R.H.T.	1.62
1	4190G	CABLE END CASTING	3.78
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08
1	4959G	3/4" HEAVY SQUARE NUT (A563)	0.26



3/4" CABLE SPLICE - 5698G

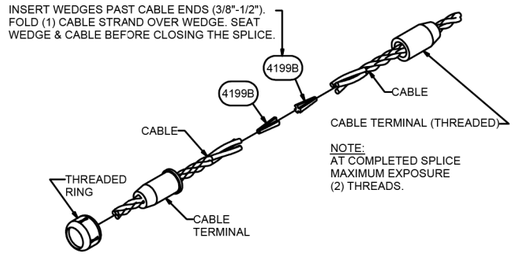
(OPEN BODY STYLE)

PARTS LIST - 5698G			
QTY	PART No	TITLE	Lbs / Each
1	5634G	3/4" STUD ASSEMBLY L.H.T.	5.74
1	5635G	3/4" STUD ASSEMBLY R.H.T.	5.74
1	5711G	3/4" TURNBUCKLE OPEN BODY STYLE	10.69



TORPEDO CABLE SPLICE - 4099G

PARTS LIST - 4099G			
QTY	PART No	TITLE	Lbs / Each
1		CABLE TERMINAL - THREADED	1.78
1		CABLE TERMINAL	1.52
1		RING - THREADED	-0.06
2	4199B	3/4" CABLE WEDGE (3 x 7)	0.08



ASSEMBLY - TORPEDO CABLE SPLICE 4099G

CASS TEMPERATURE & TENSION CHART (NEAREST 100 lb/F)		
FAHRENHEIT DEGREES	STD. CABLE LB/FORCE	PRE-STRETCHED LB/FORCE
< = -15	8800	7500
-10	8600	7300
-5	8400	7100
0	8200	7000
5	8000	6800
10	7800	6600
15	7600	6500
20	7400	6300
25	7200	6100
30	7000	6000
35	6800	5800
40	6600	5600
45	6400	5500
50	6200	5300
55	6000	5100
60	5800	5000
65	5600	4800
70	5400	4600
75	5200	4500
80	5000	4300
85	4800	4100
90	4600	4000
95	4400	3800
100	4200	3600
105	4000	3500
110	3800	3300
115	3600	3100
120	3400	3000
125	3200	2800
130	3000	2700
135	2900	2600
140	2700	2500
145	2500	2400
150	2400	2300
160	2200	2100
170	2000	1900
180	1800	1700
190	1600	1500
200	1400	1300

ALLOWABLE DEVIATION FROM CHART IN TANGENT SECTIONS: +800, -200 POUNDS/FORCE.

CABLE TENSION READINGS ARE TYPICALLY HIGHER IN CURVED CABLE SECTIONS.

NOTE:

1. TURNBUCKLES SHALL BE INSTALLED WITH A MINIMUM OF 1-1/2" THREAD ENGAGEMENT. TO ALLOW FOR MAINTENANCE/REPAIR ADJUSTMENTS AT A LATER DATE, TRINITY SUGGESTS INSTALLER UTILIZE NO MORE THAN 4" THREAD ENGAGEMENT.

2. WHEN CUTTING CABLE LENGTHS IN THE FIELD FROM CABLE REELS, IT MAY BE PERMISSIBLE TO UTILIZE A CABLE TORPEDO SPLICE (4099G) BETWEEN TURNBUCKLES. DO NOT USE FOR CABLE LENGTH SHORTER THAN 100'. PLEASE CONTACT TRINITY, CONSULT TRINITY'S MANUAL OR SPECIFYING AGENCY TO DETERMINE IF APPROPRIATE FOR SPECIFIC APPLICATION.

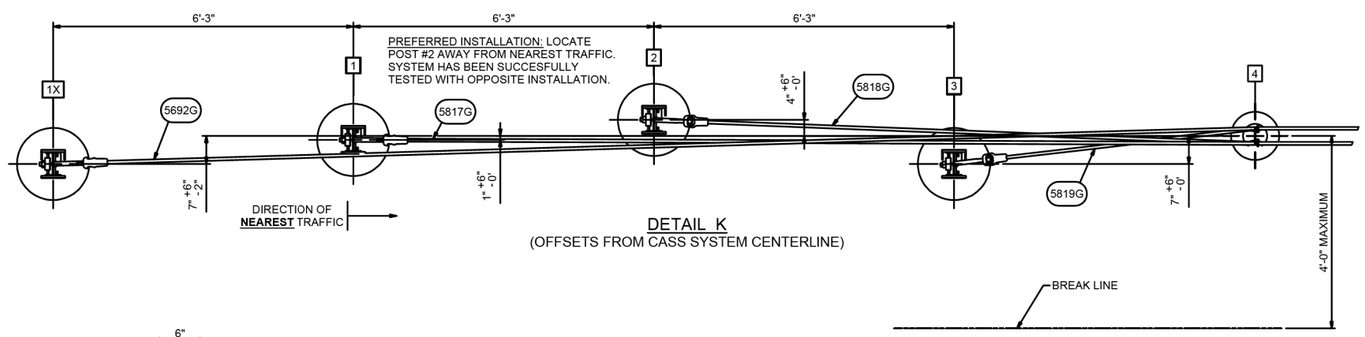
PROJ. CASS-S3

CASS-S3 (4:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

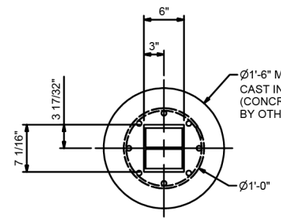
TRINITY HIGHWAY PRODUCTS, LLC

SPEC:
SHIPPING WT:
DRW: E.A.S. 1/25/2010
CHK: G.N. 1/25/2010
SHT: 3 OF 5 SIZE: D
DWG NO: SS-742 REV 0

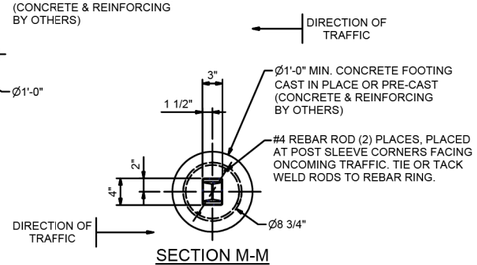
TRINITY HIGHWAY PRODUCTS CASS-S3 4-CABLE GUARDRAIL SAFETY SYSTEM



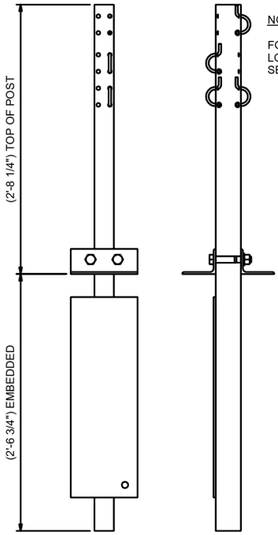
DETAIL K
(OFFSETS FROM CASS SYSTEM CENTERLINE)



SECTION L-L

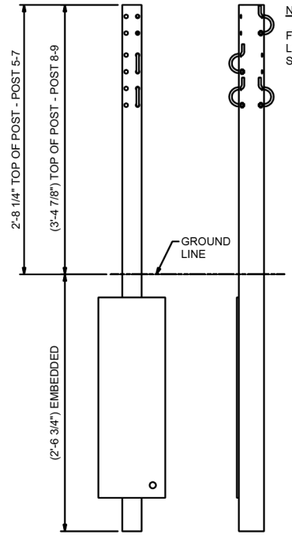


SECTION M-M



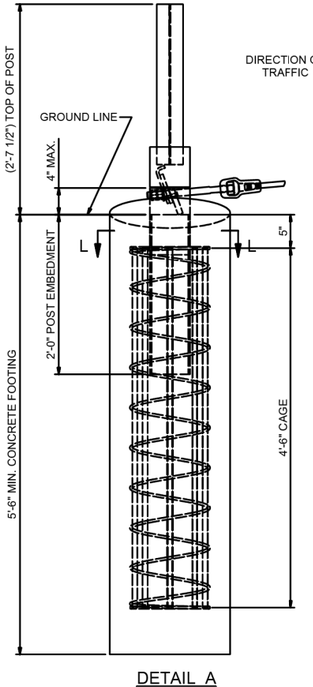
NOTE:
FOR LOCATION OF LOCK BOLTS SEE VIEWS BELOW

CCT TERMINAL POST
(CCT POST 4)
(POST OPTION 2 SHOWN)

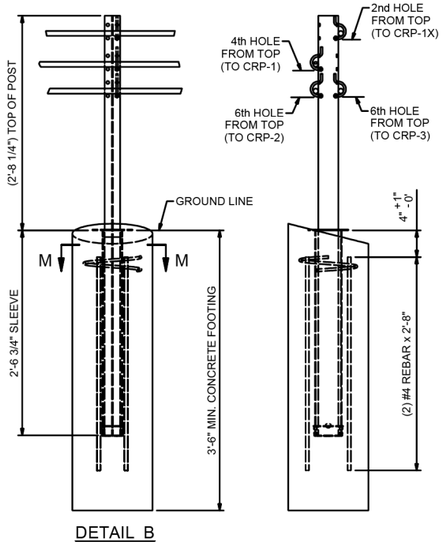


NOTE:
FOR LOCATION OF LOCK BOLTS SEE VIEWS BELOW

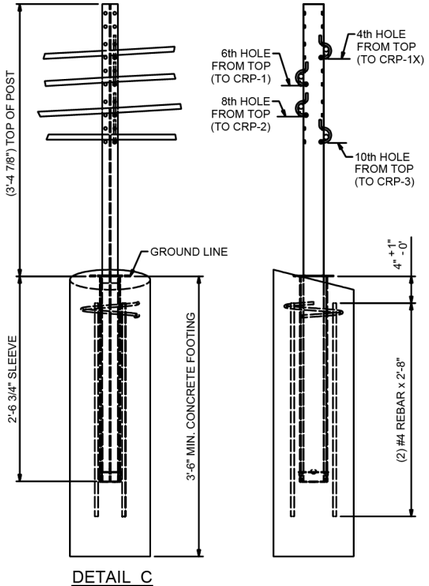
CCT TERMINAL POST
(CCT - POST 5 - 9)
(POST OPTION #2 SHOWN)



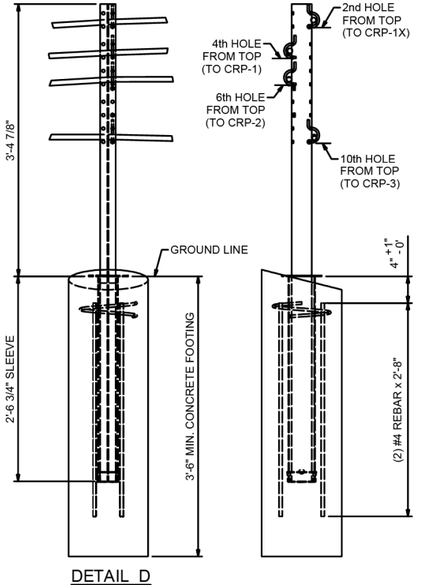
DETAIL A
(CABLE RELEASE POST 1-3)



DETAIL B
(POST-4-7)
(POST OPTION #1 SHOWN)



DETAIL C
(POST-8)
(POST OPTION #1 SHOWN)



DETAIL D
(POST-9)
(POST OPTION #1 SHOWN)

PROJ. CASS-S3

CASS-S3 (4:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY PRODUCTS, LLC

SPEC:		
SHIPPING WT:		
DRW: E.A.S.	1/25/2010	
CHK: G.N.	1/25/2010	
SHT: 4 OF 5	SIZE: D	
DWG NO: SS-742	REV 0	

TRINITY HIGHWAY PRODUCTS CASS-S3 4-CABLE GUARDRAIL SAFETY SYSTEM

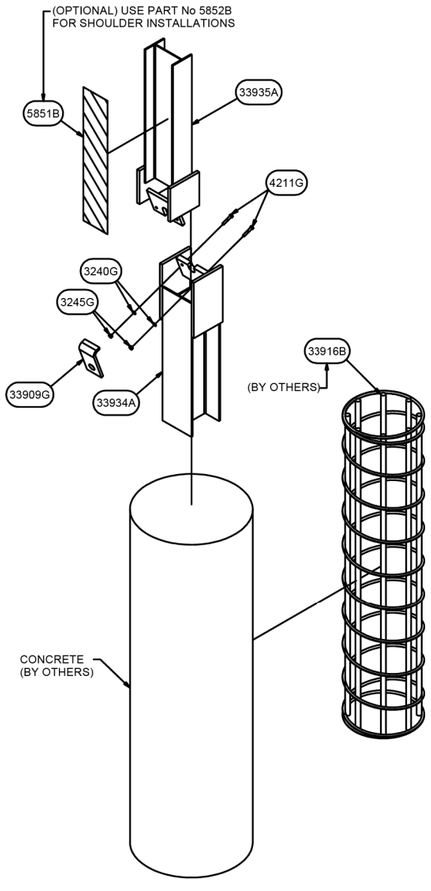
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-391	12	57

Plotting Date: 03/05/2018

PARTS LIST - CCT CABLE RELEASE POST No. 1-3 - IN CONCRETE			
QTY	PART No	TITLE	Lbs / Each
2	3240G	5/16 FLAT WASHER (F844)	0.00
2	3245G	5/16 HEX NUT (A563)	0.01
2	4211G	5/16 HEX BOLT x 1 3/4" (A307)	0.05
1	5851B	REFLECTOR - MEDIAN - YELLOW	0.10
1	33909G	CASS CABLE BRACKET	1.92
1	33916B	REINFORCING CAGE - CRP POST	68.07
1	33934A	CRP - LOWER POST	51.80
1	33935A	CRP - UPPER POST	31.57

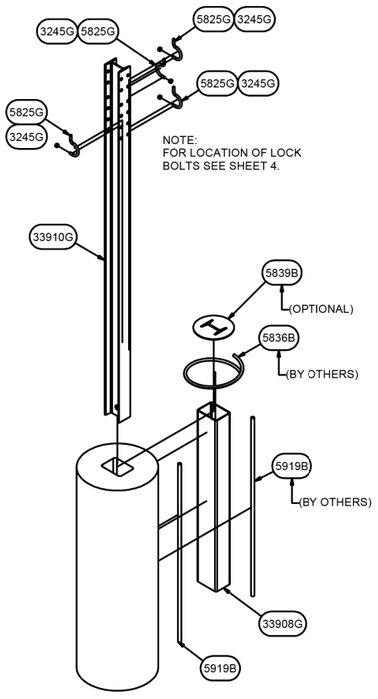
ALL HARDWARE FOR THE CCT CAN BE ORDERED AS ONE PACKAGE:

PART No. 33598G: (1) SET OF TERMINAL HARDWARE FOR 1" CABLE FITTINGS.
PART No. 33599G: (1) SET OF TERMINAL HARDWARE FOR 3/4" CABLE FITTINGS.



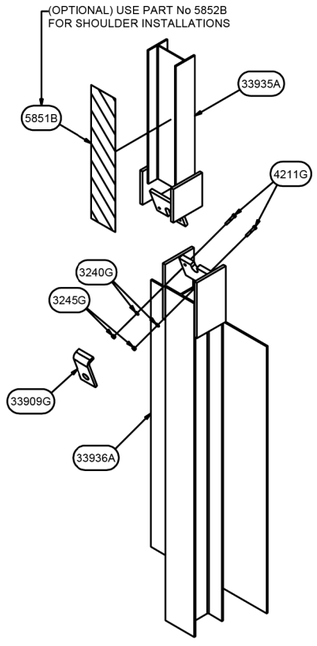
CRP TERMINAL POST - IN CONCRETE
(CCT TERMINAL POST 1X - 3)
(POST OPTION #1 SHOWN)

PARTS LIST - CCT TERMINAL POST No. 4-9 - IN CONCRETE			
QTY	PART No	TITLE	Lbs / Each
4	3245G	5/16 DIA. HEX NUT (A563)	0.01
4	5825G	CABLE LOCK BOLT (A307)	0.12
1	5836B	CONCRETE REINFORCING RING	0.88
1	5839B	SLEEVE COVER - S3 POST	0.11
2	5919B	#4 REBAR - TERMINAL POST	1.78
1	33908G	SLEEVE - TERMINAL LINE POST	13.80
1	33910G	350-TL3 TERMINAL POST	28.63

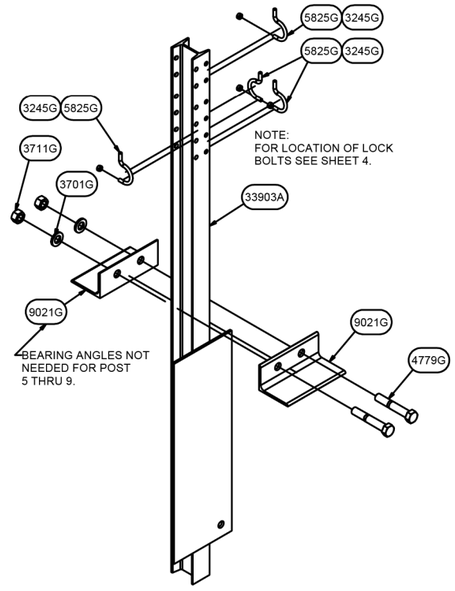


TERMINAL POST - IN CONCRETE
(CCT TERMINAL POST 4 - 9)
(POST OPTION #1 SHOWN)

PARTS LIST - CCT CABLE RELEASE POST No. 1-3 - DRIVEN			
QTY	PART No	TITLE	Lbs / Each
2	3240G	5/16 FLAT WASHER (F844)	0.00
2	3245G	5/16 HEX NUT (A563)	0.01
2	4211G	5/16 HEX BOLT x 1 3/4" (A307)	0.05
1	5851B	REFLECTOR - MEDIAN - YELLOW	0.10
1	33909G	CASS CABLE BRACKET	1.92
1	33935A	CRP - UPPER POST	31.57
1	33936A	CRP - LOWER POST	178.57



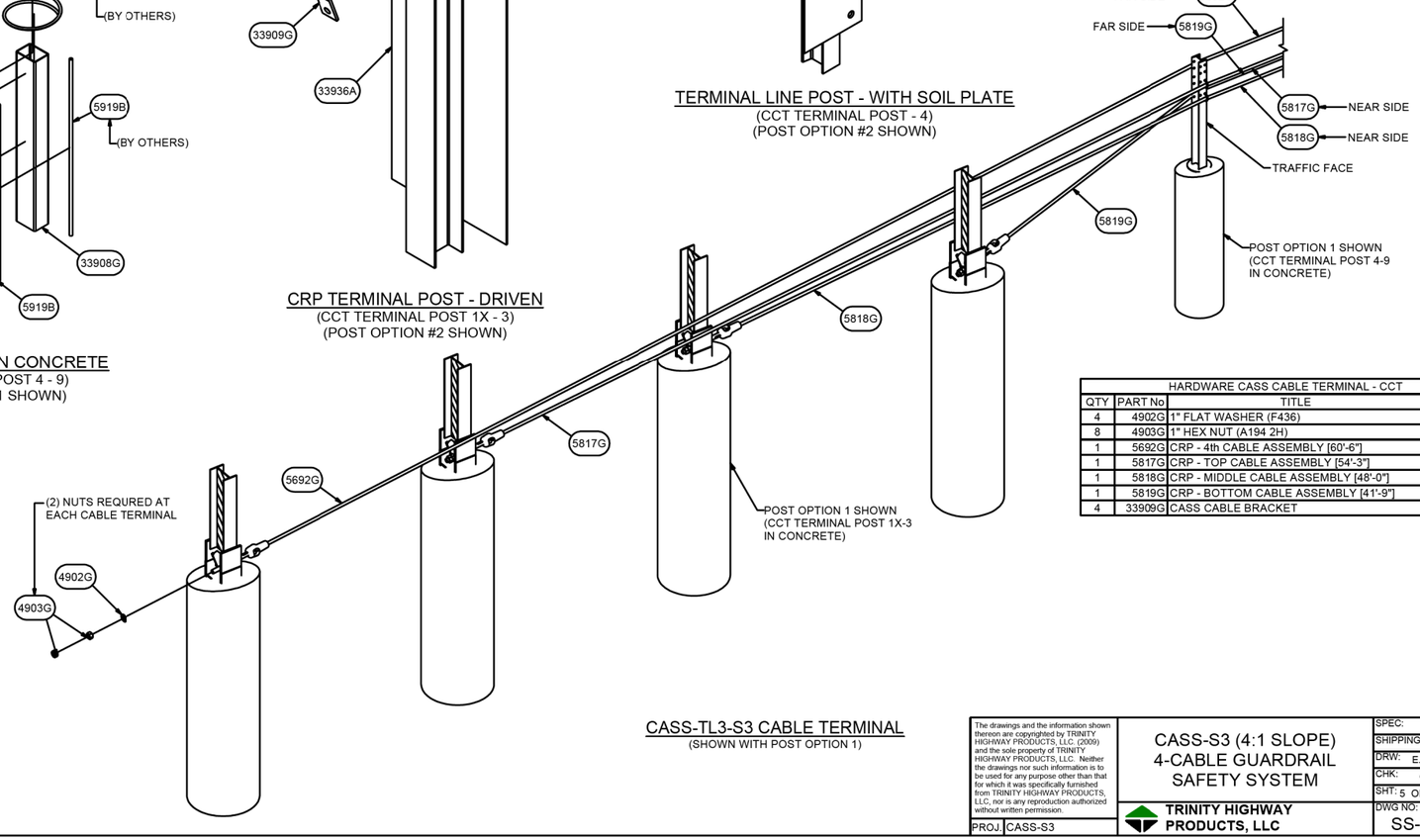
CRP TERMINAL POST - DRIVEN
(CCT TERMINAL POST 1X - 3)
(POST OPTION #2 SHOWN)



TERMINAL LINE POST - WITH SOIL PLATE
(CCT TERMINAL POST - 4)
(POST OPTION #2 SHOWN)

PARTS LIST - CCT TERMINAL POST No. 4 - WITH SOIL PLATE			
QTY	PART No	TITLE	Lbs / Each
4	3245G	5/16 DIA. HEX NUT (A563)	0.01
2	3701G	3/4 FLAT WASHER (F436)	0.01
2	3711G	3/4 HEX NUT (A194 2H)	0.02
2	4779G	3/4 HEX BOLT x 4 1/2" (A325)	0.09
4	5825G	CABLE LOCK BOLT (A307)	0.12
2	9021G	BEARING ANGLE (A36)	3.81
1	33903A	350-TL3 TERMINAL POST w/ SOIL PLATE	42.25

PARTS LIST - CCT TERMINAL POST No. 5-9 - WITH SOIL PLATE			
QTY	PART No	TITLE	Lbs / Each
3	3245G	5/16 DIA. HEX NUT (A563)	0.01
3	5825G	CABLE LOCK BOLT (A307)	0.12
1	33903A	350-TL3 TERMINAL POST w/ SOIL PLATE	42.25



CASS-TL3-S3 CABLE TERMINAL
(SHOWN WITH POST OPTION 1)

HARDWARE CASS CABLE TERMINAL - CCT			
QTY	PART No	TITLE	Lbs / Each
4	4902G	1" FLAT WASHER (F436)	0.11
8	4903G	1" HEX NUT (A194 2H)	0.33
1	5692G	CRP - 4th CABLE ASSEMBLY [60'-6"]	116.97
1	5817G	CRP - TOP CABLE ASSEMBLY [54'-3"]	107.53
1	5818G	CRP - MIDDLE CABLE ASSEMBLY [48'-0"]	98.12
1	5819G	CRP - BOTTOM CABLE ASSEMBLY [41'-9"]	88.86
4	33909G	CASS CABLE BRACKET	1.92

PROJ. CASS-S3

CASS-S3 (4:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY PRODUCTS, LLC

SPEC:		
SHIPPING WT:		
DRW: E.A.S.	1/25/2010	
CHK: G.N.	1/25/2010	
SHT: 5 OF 5	SIZE: D	
DWG NO: SS-742	REV 0	

Plot Scale - 1:200
- Plotted From - tnvi1n23
file: SS-742_TL3_S3_4T1_4C.dgn
File - ...\Working\CASS SS743.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	13	57

Plotting Date: 03/05/2018

Plot Scale - 1:200

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.

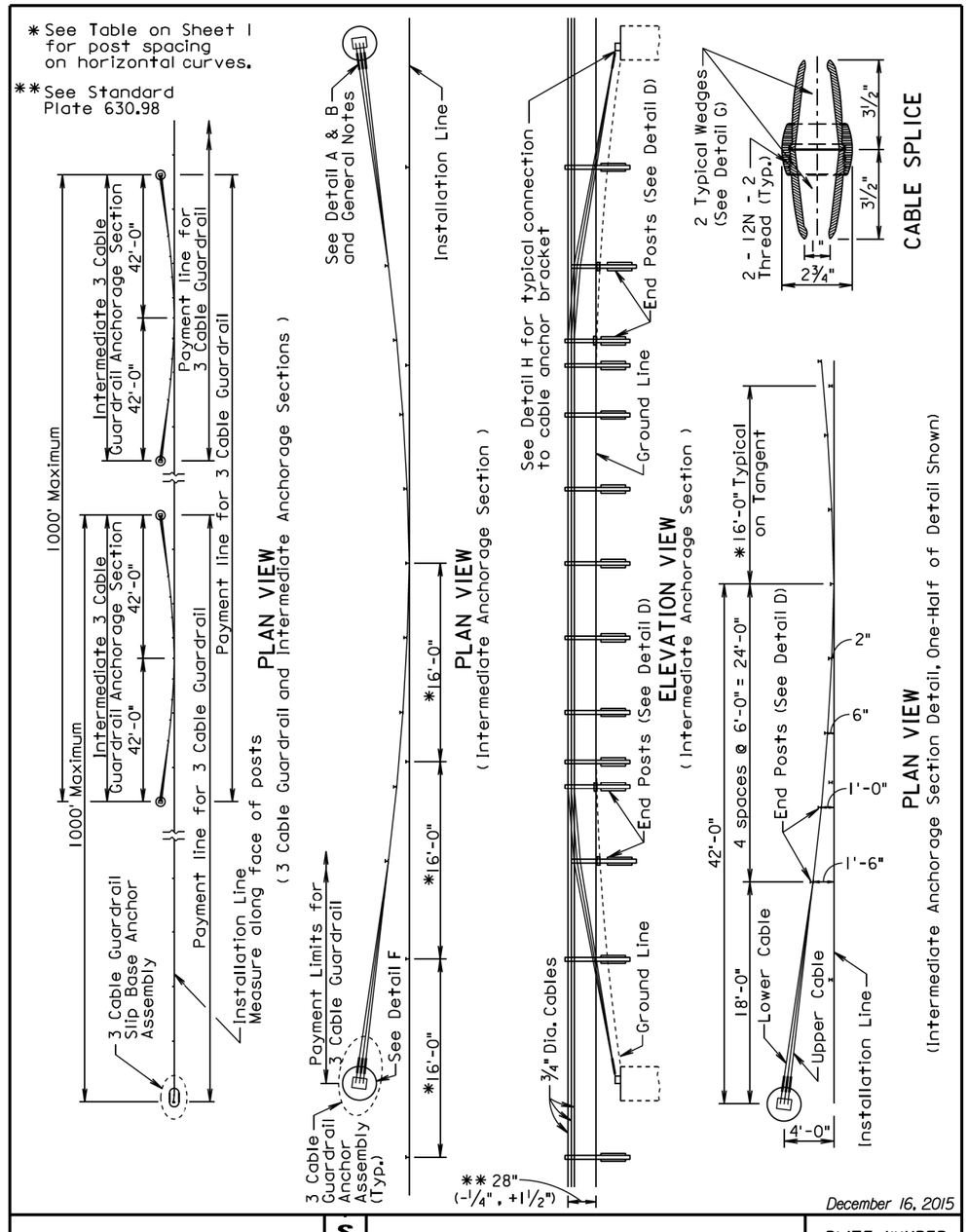
The cable shall be retensioned after the initial 2 week pretension period in accordance with the following table:

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

December 16, 2015

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



December 16, 2015

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

- Plotted From - tnvi1n23

File - ...\Working\Standard Plates.dgn

Published Date: 1st Qtr. 2018

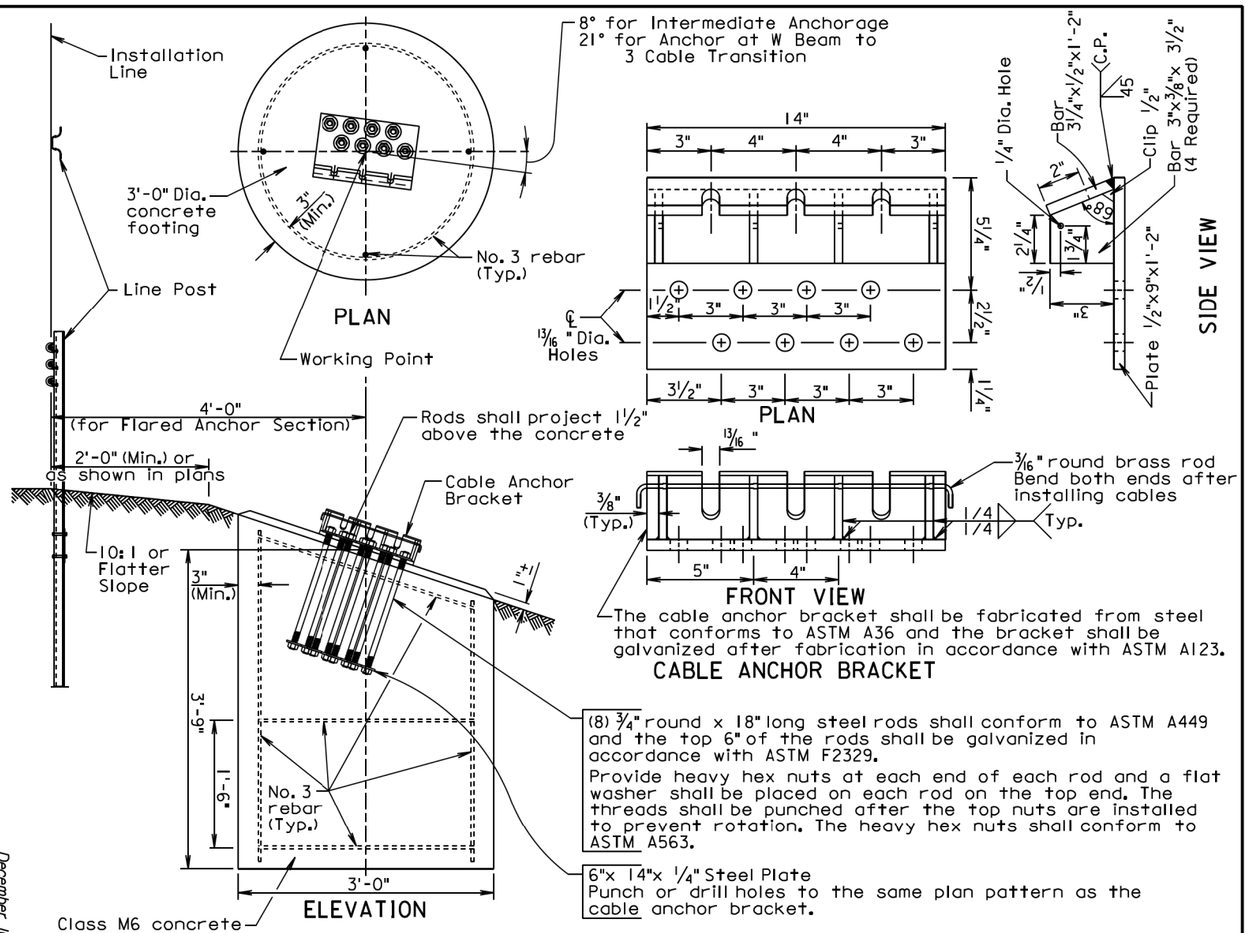
SDDOT

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: 1st Qtr. 2018

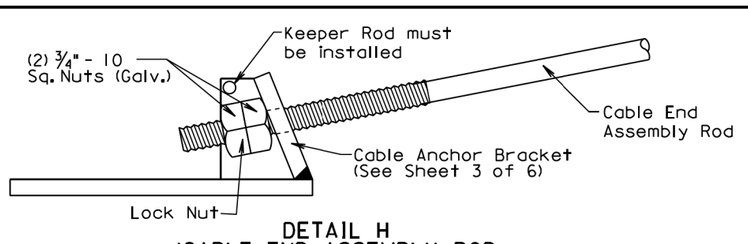
SDDOT

3 CABLE GUARDRAIL (LOW TENSION)

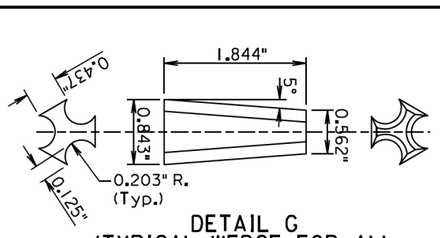
PLATE NUMBER 629.01

Sheet 4 of 6

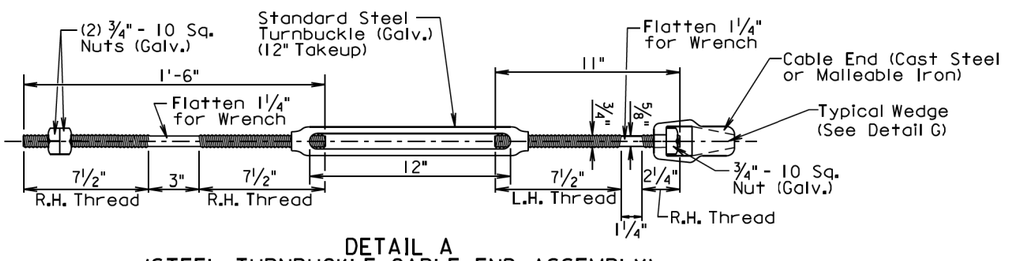
December 16, 2015



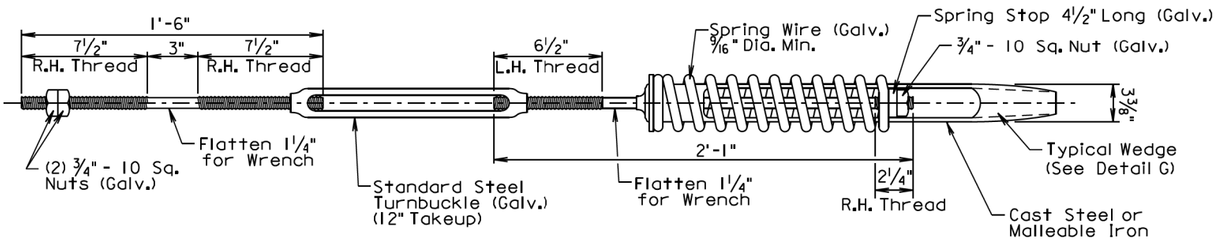
DETAIL H
(CABLE END ASSEMBLY ROD CONNECTION TO CABLE ANCHOR BRACKET)



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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SHEET 14

TOTAL SHEETS 57

Published Date: 1st Qtr. 2018

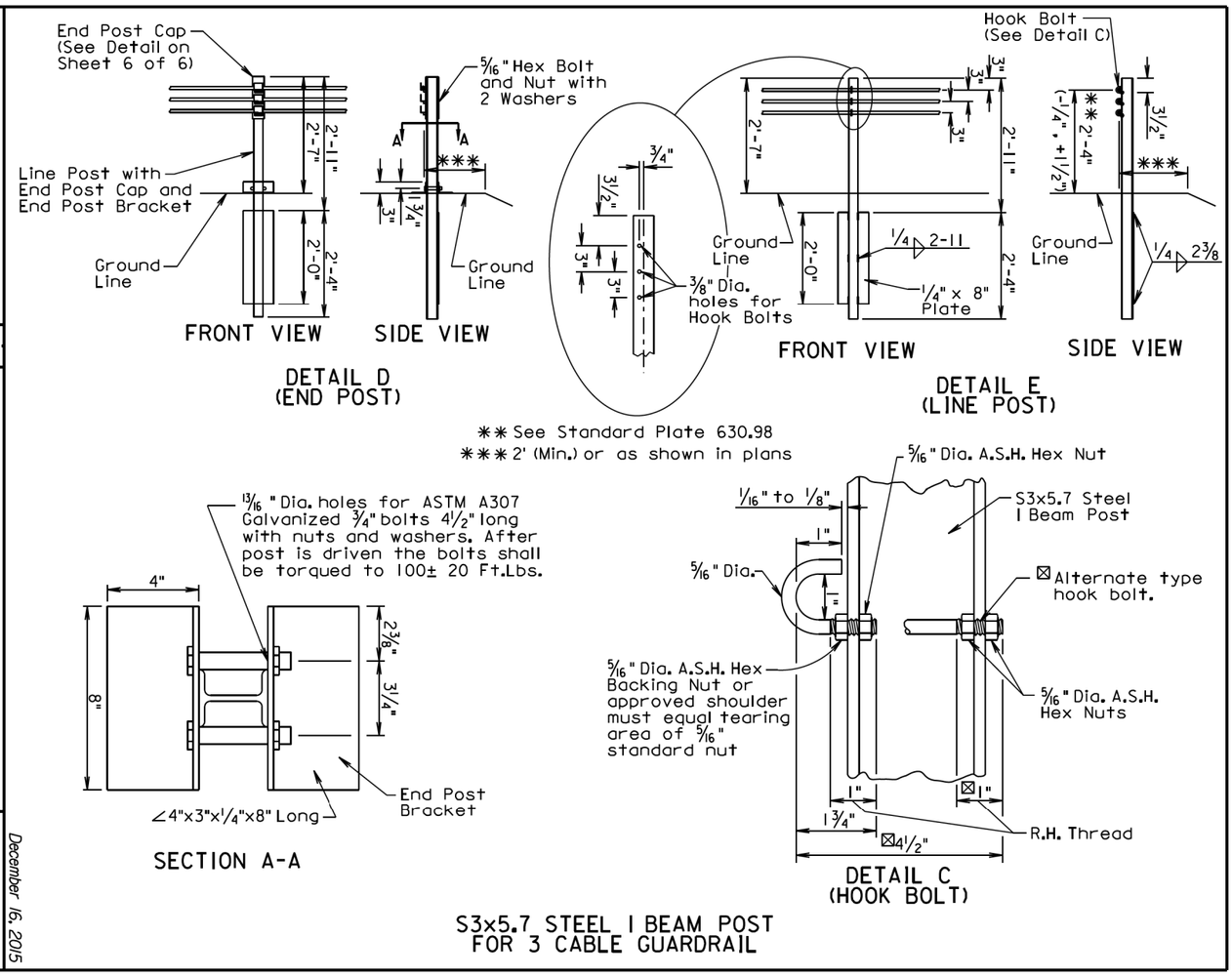
SDDOT

3 CABLE GUARDRAIL (LOW TENSION)

PLATE NUMBER 629.01

Sheet 5 of 6

December 16, 2015



Published Date: 1st Qtr. 2018

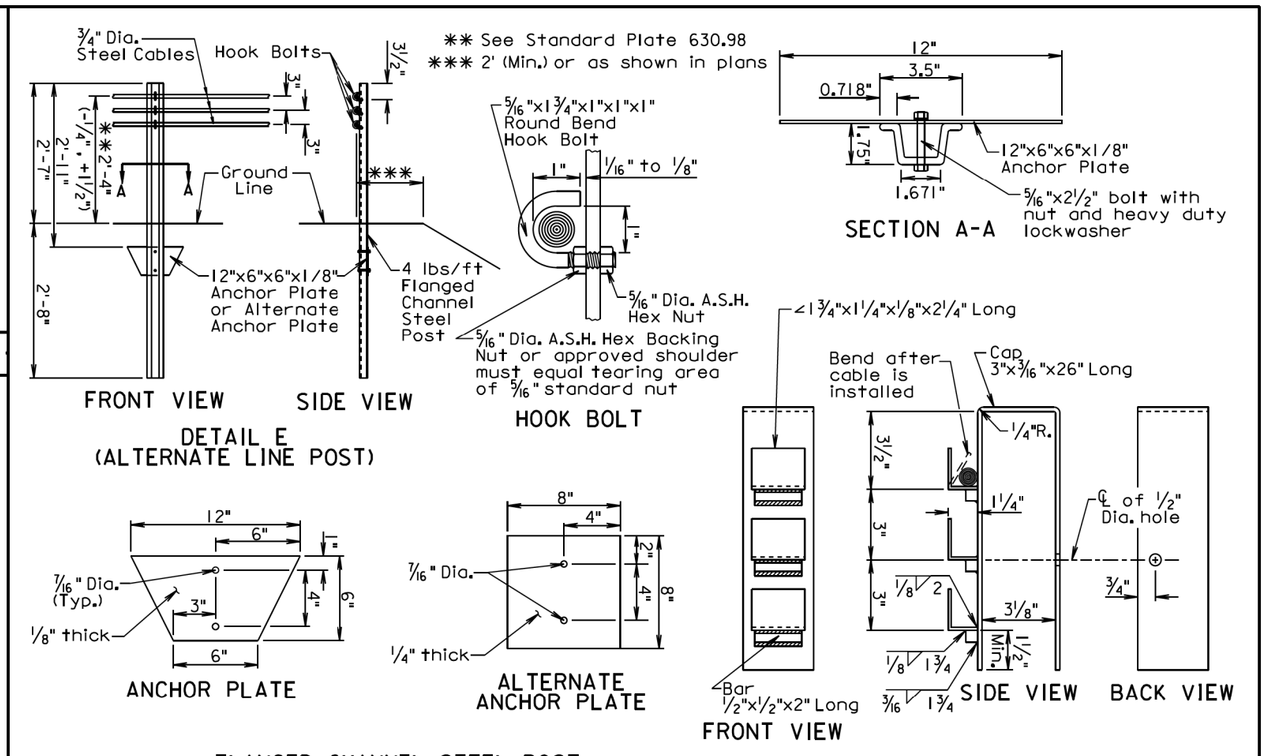
SDDOT

3 CABLE GUARDRAIL (LOW TENSION)

PLATE NUMBER 629.01

Sheet 6 of 6

December 16, 2015



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.

STATE OF SOUTH DAKOTA

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SHEET 15

TOTAL SHEETS 57

Published Date: 1st Qtr. 2018

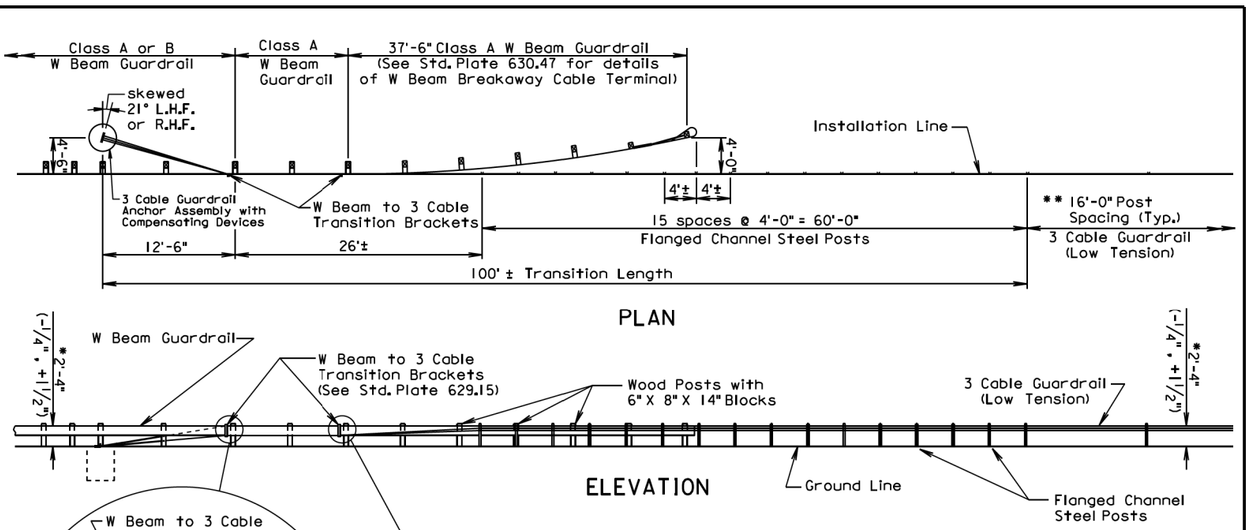
SDDOT

W BEAM TO 3 CABLE TRANSITION

PLATE NUMBER 629.05

Sheet 1 of 1

December 16, 2014



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.

Published Date: 1st Qtr. 2018

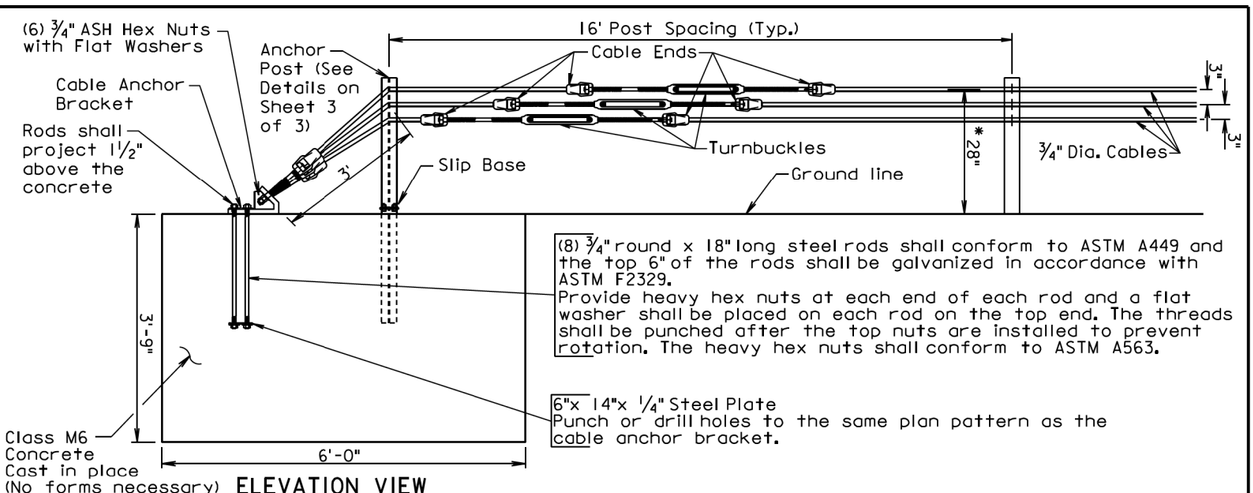
SDDOT

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

PLATE NUMBER 629.10

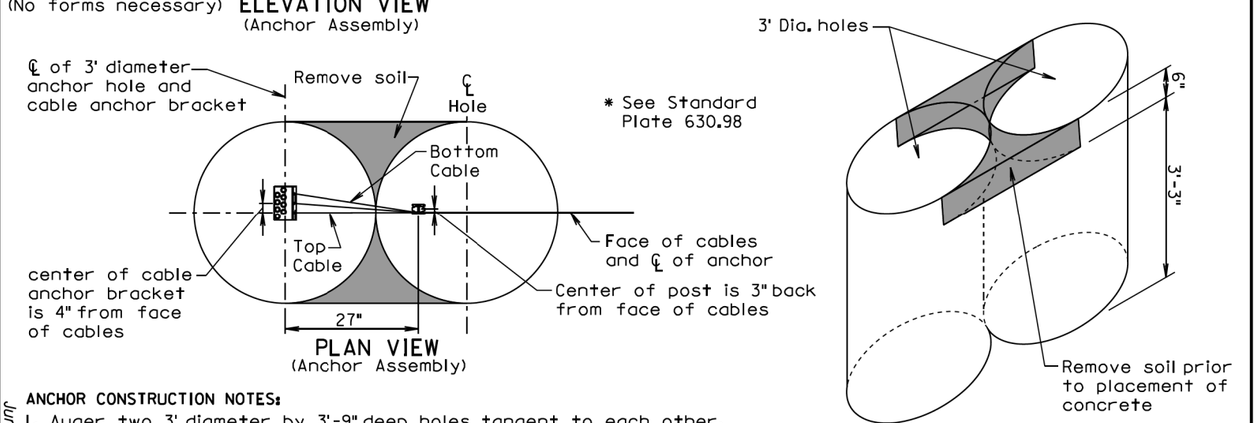
Sheet 1 of 3

June 26, 2016



(8) 3/4" 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 1/4" Steel Plate
Punch or drill holes to the same plan pattern as the cable anchor bracket.



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.

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SHEET 16
TOTAL SHEETS 57

Published Date: 1st Qtr. 2018

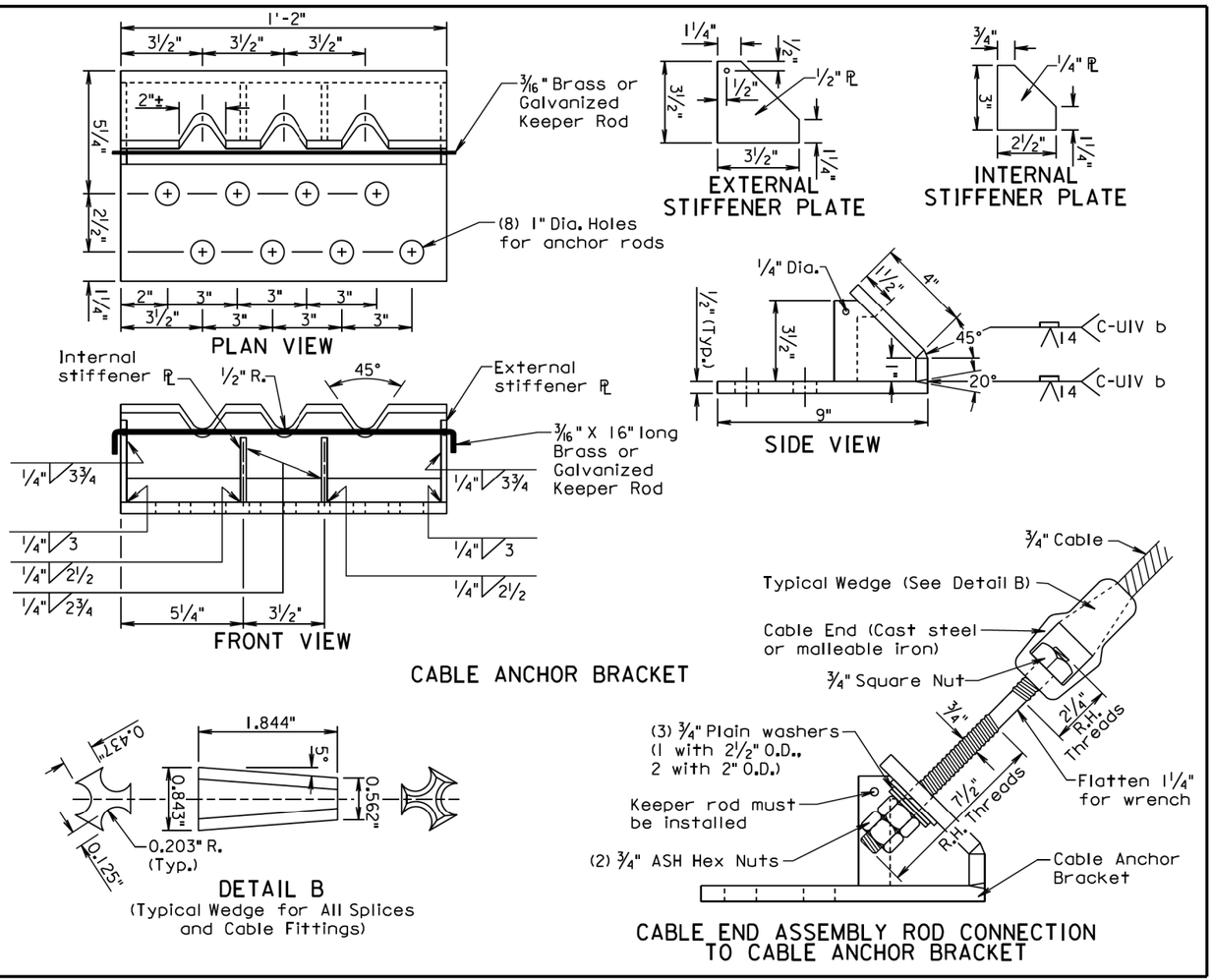
SDDOT

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

PLATE NUMBER 629.10

Sheet 2 of 3

June 26, 2016



Published Date: 1st Qtr. 2018

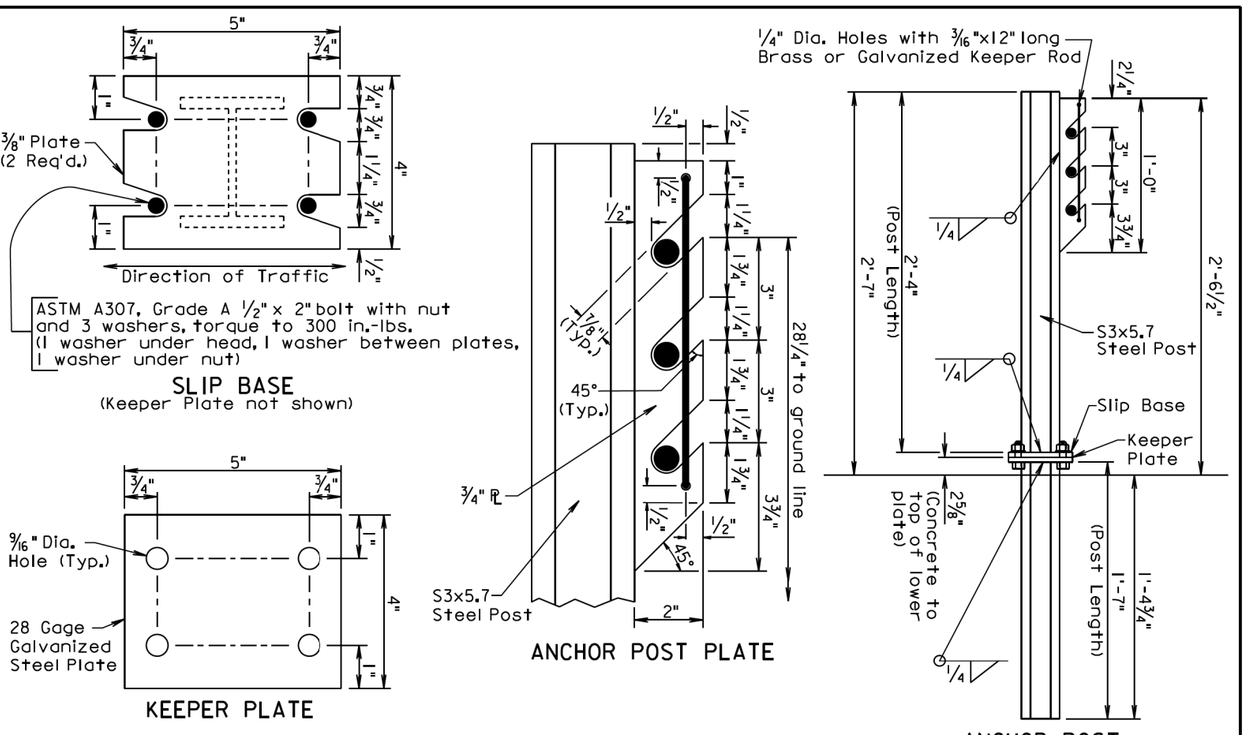
SDDOT

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

PLATE NUMBER 629.10

Sheet 3 of 3

June 26, 2016



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".

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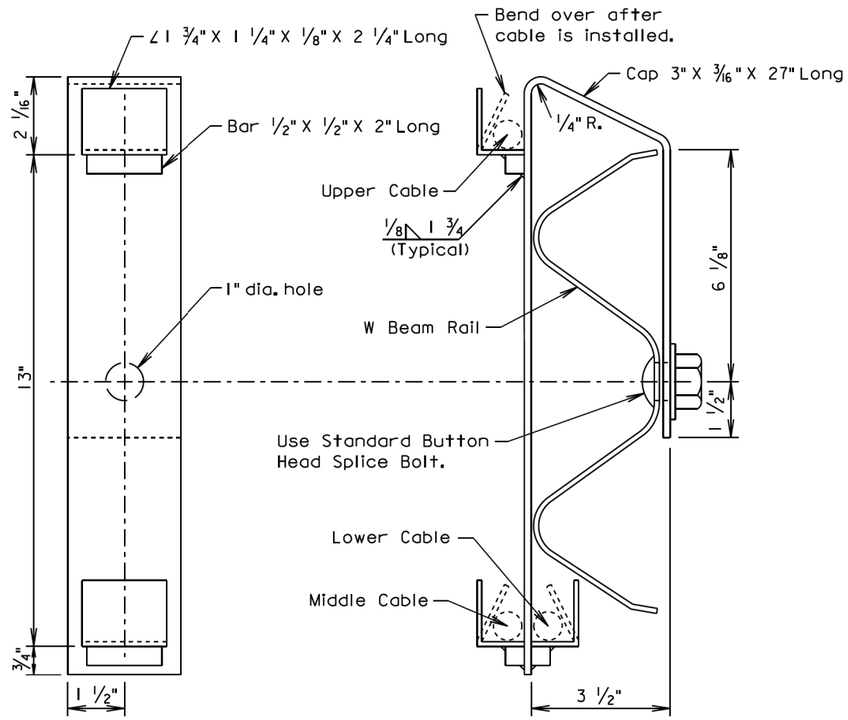


ELEVATION
(TRANSITION BRACKET)

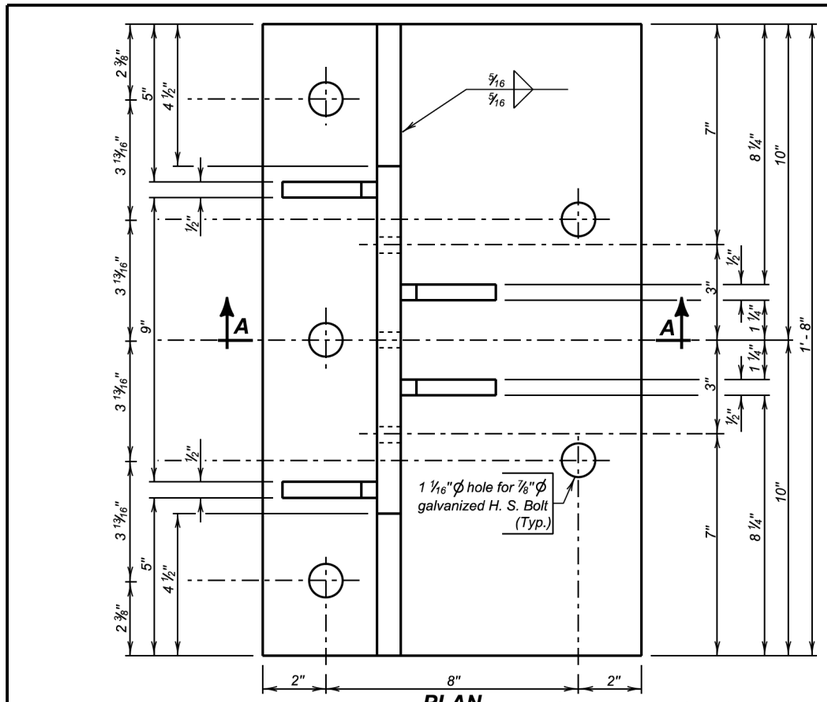
END VIEW
(W BEAM RAIL AND
TRANSITION BRACKET)

GENERAL NOTES:

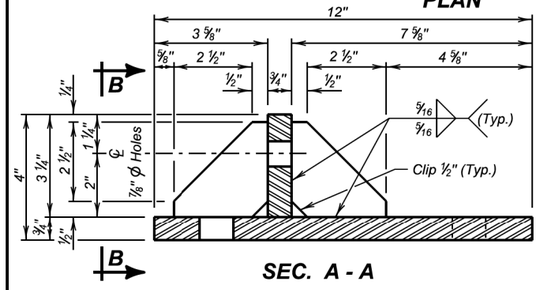
Steel used in the fabrication of the bracket shall conform to ASTM A36 and the bracket shall be galvanized after fabrication in accordance with ASTM A123.

March 31, 2000

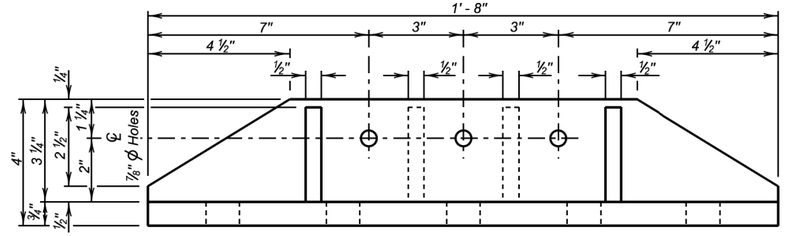
Published Date: 1st Qtr. 2018	SDDOT	W BEAM TO 3 CABLE TRANSITION BRACKET	PLATE NUMBER 629.15
			Sheet 1 of 1



PLAN



SEC. A - A



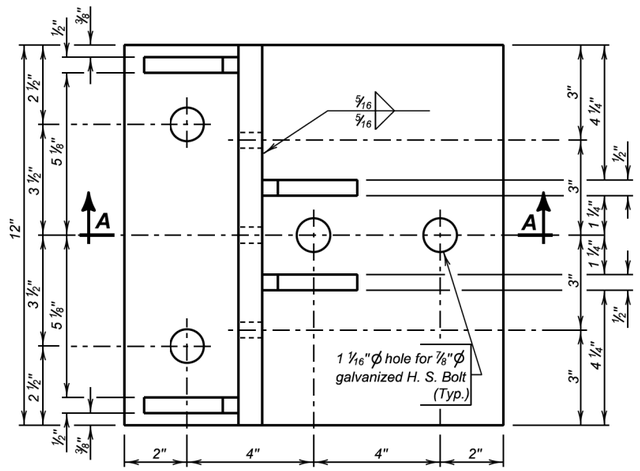
VIEW B - B

GENERAL NOTES:

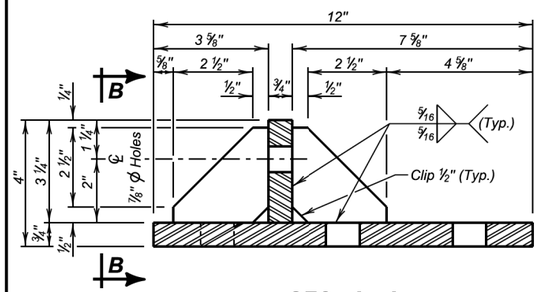
1. All steel shall conform to ASTM A709 Grade 36.
2. Welding and weld inspection shall be in conformance with AWS/ANSI D1.1 (Current Year) Structural Welding Code - Steel.
3. After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).
4. Bolts, nuts, and washers shall be provided with each 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

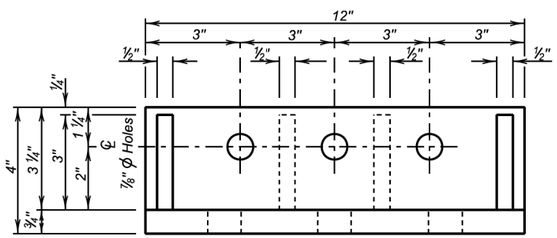
Published Date: 1st Qtr. 2018	SDDOT	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER 629.30
			Sheet 1 of 1



PLAN



SEC. A - A



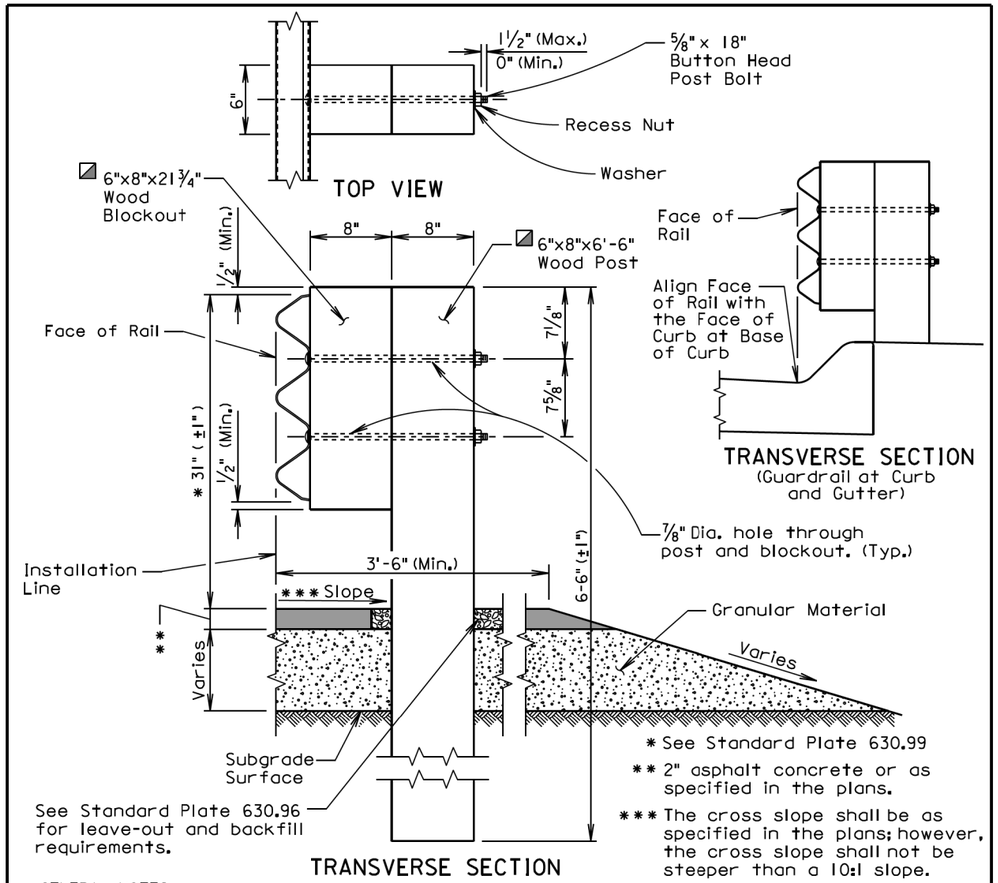
VIEW B - B

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: 1st Qtr. 2018	SDDOT	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER 629.31
			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 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.

☑ The post and blockout illustrated above is typical for standard thrie beam guardrail. When other variations of posts and blockouts are specified on other standard plates (e.g. transitions) then the posts and blockouts shall be as specified on the other standard plates or as specified 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.

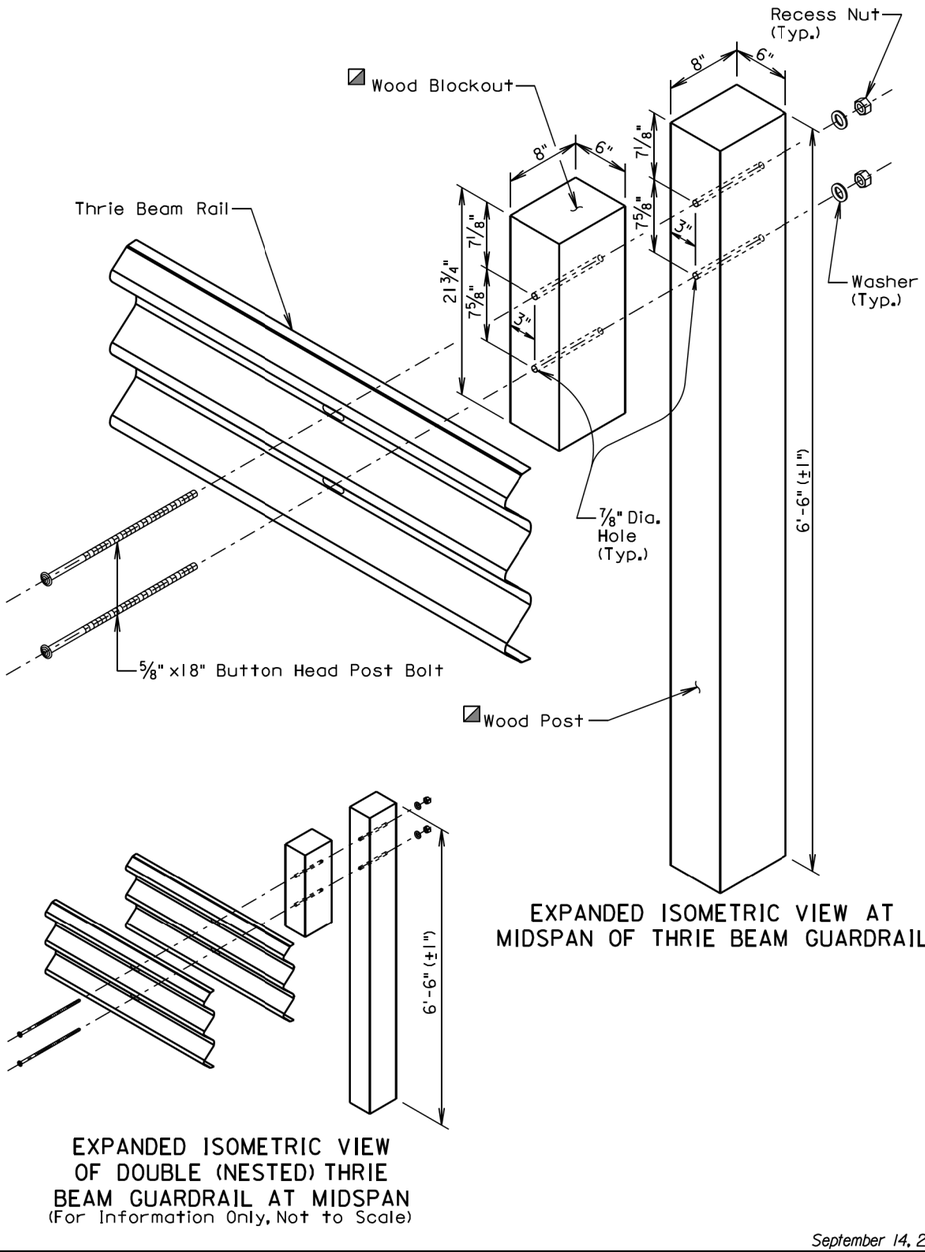
The top of post and top of block shall have a true square cut. The top of block shall be a maximum of ±1/2 inch from the top of the post.

September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 1 of 5

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	20	57

Plotting Date: 03/05/2018

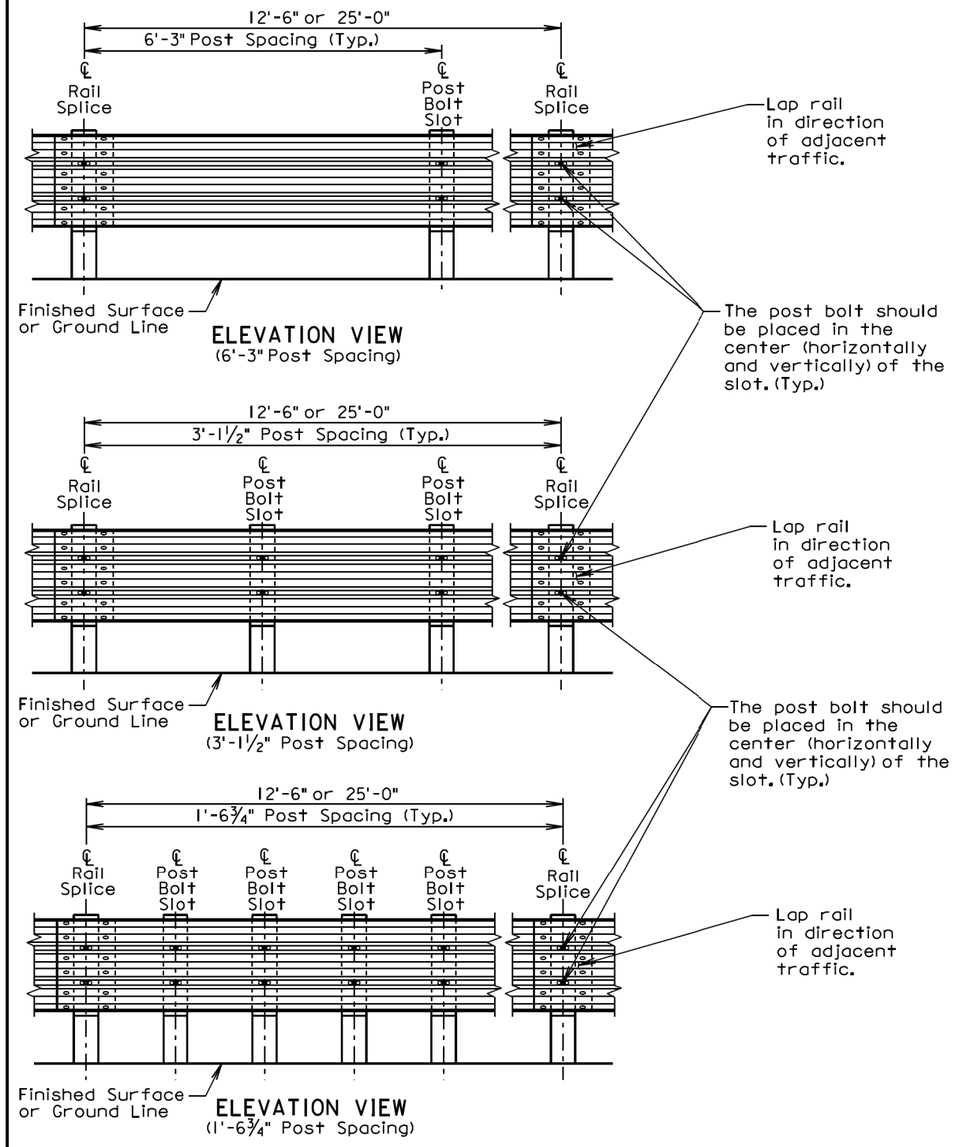


EXPANDED ISOMETRIC VIEW AT MIDSPAN OF THRIE BEAM GUARDRAIL

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

September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 2 of 5



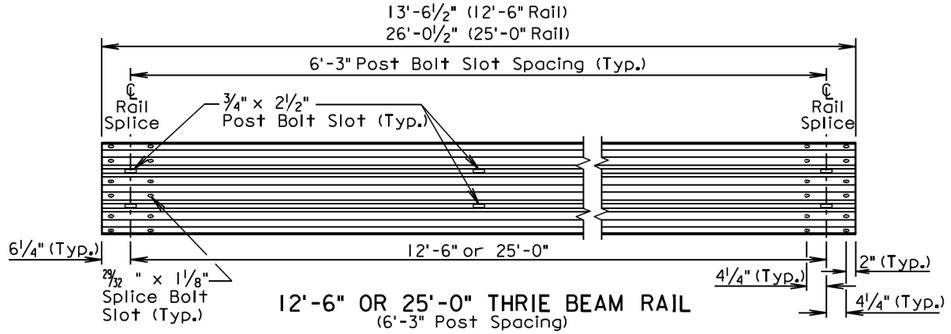
ELEVATION VIEW
(6'-3" Post Spacing)

ELEVATION VIEW
(3'-1 1/2" Post Spacing)

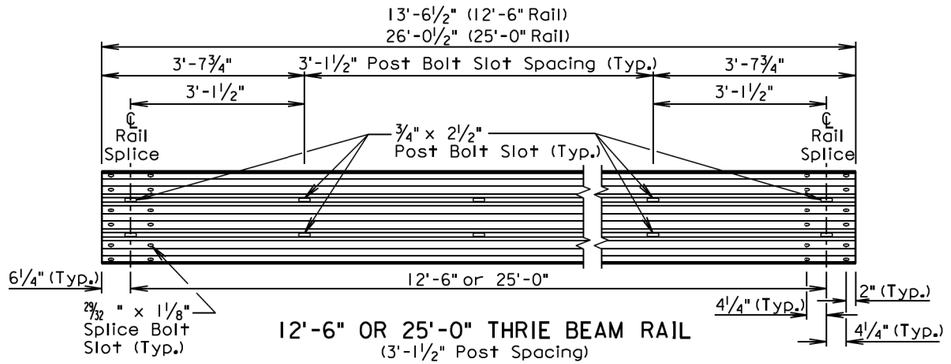
ELEVATION VIEW
(1'-6 3/4" Post Spacing)

September 14, 2017

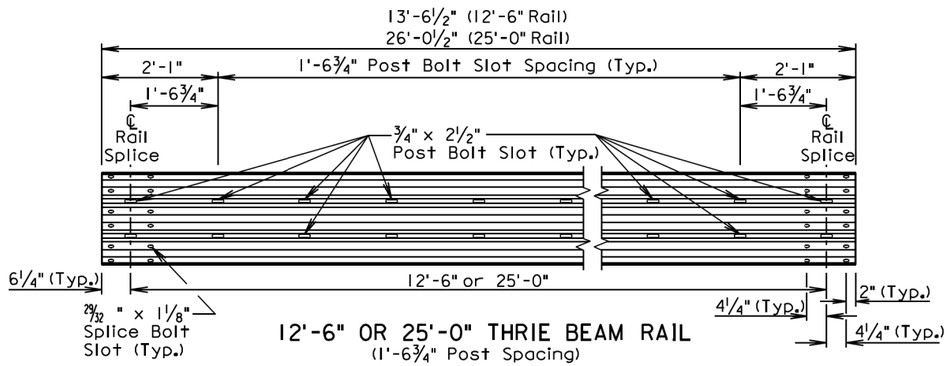
Published Date: 1st Qtr. 2018	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 3 of 5



12'-6" OR 25'-0" THRIE BEAM RAIL
(6'-3" Post Spacing)



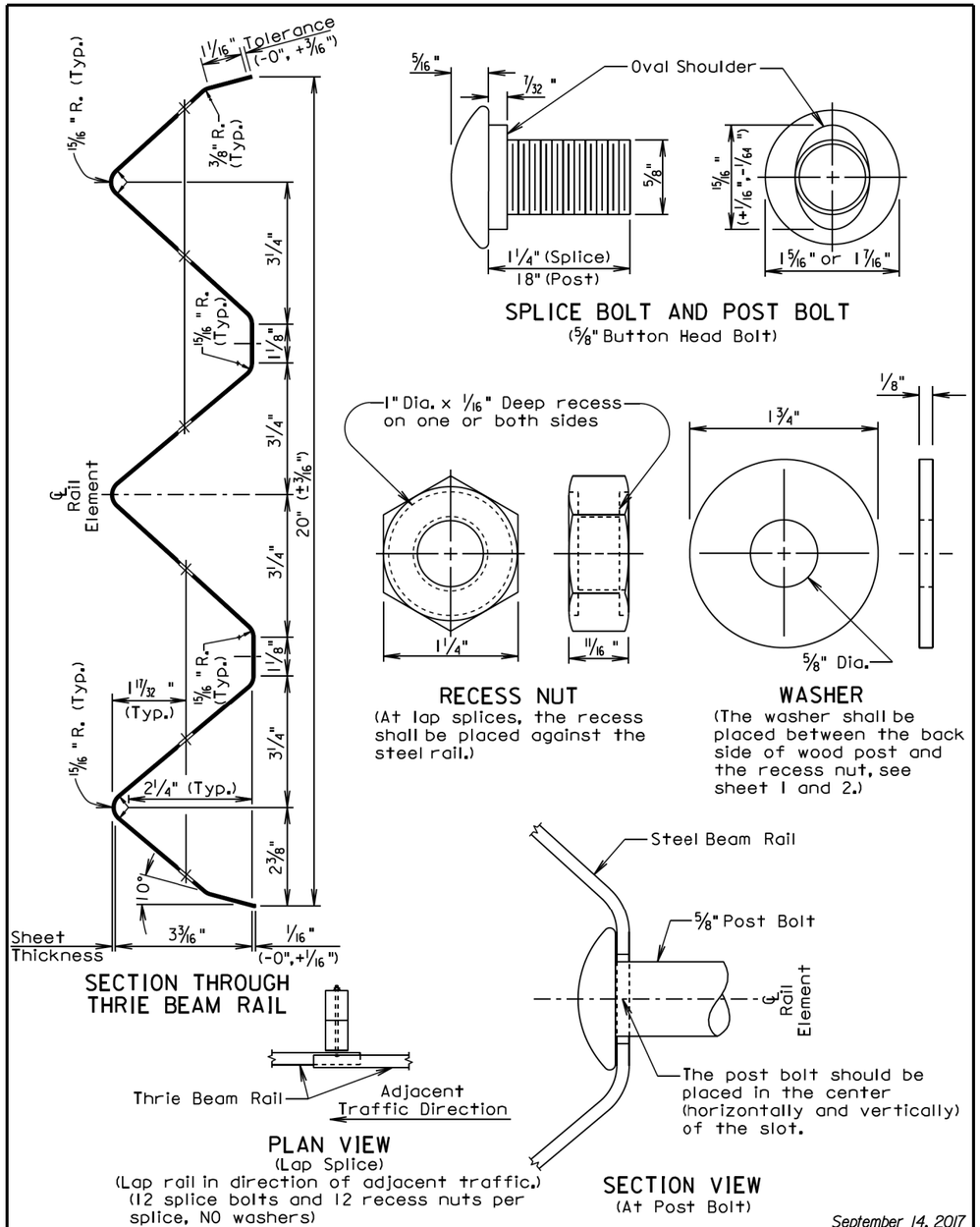
12'-6" OR 25'-0" THRIE BEAM RAIL
(3'-1½" Post Spacing)



12'-6" OR 25'-0" THRIE BEAM RAIL
(1'-6¾" Post Spacing)

September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 4 of 5



SPLICE BOLT AND POST BOLT
(⅝" 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.)

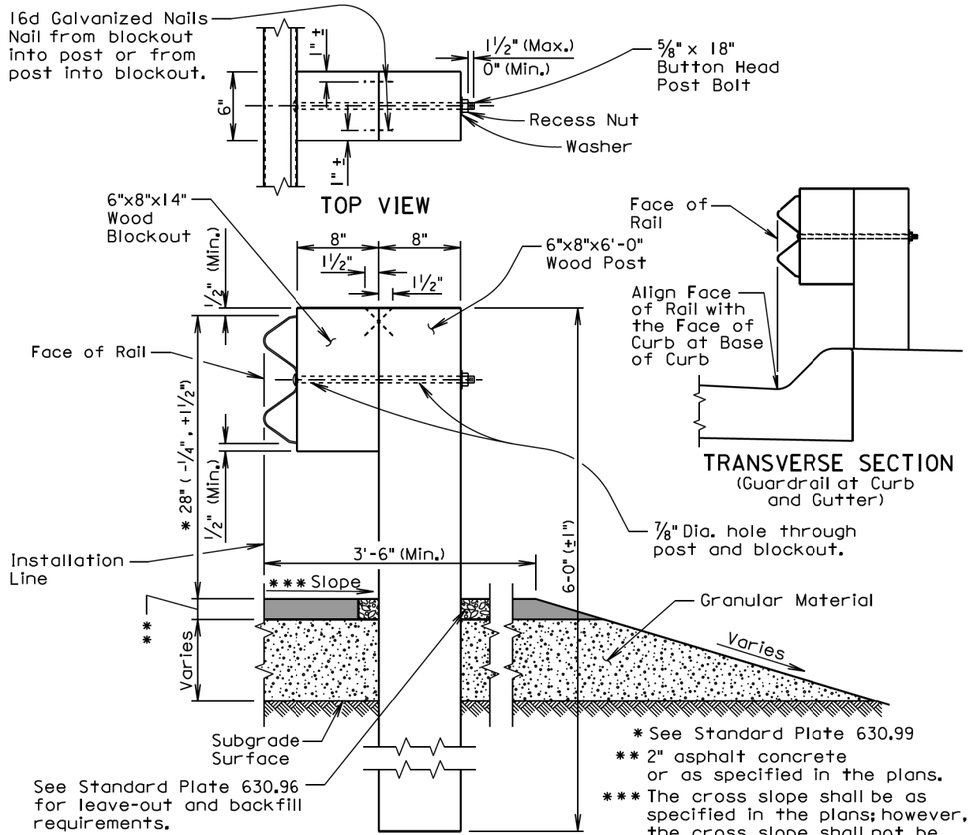
SECTION THROUGH THRIE BEAM RAIL

PLAN VIEW
(Lap Splice)
(Lap rail in direction of adjacent traffic.)
(12 splice bolts and 12 recess nuts per splice, NO washers)

SECTION VIEW
(At Post Bolt)

September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 5 of 5



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.

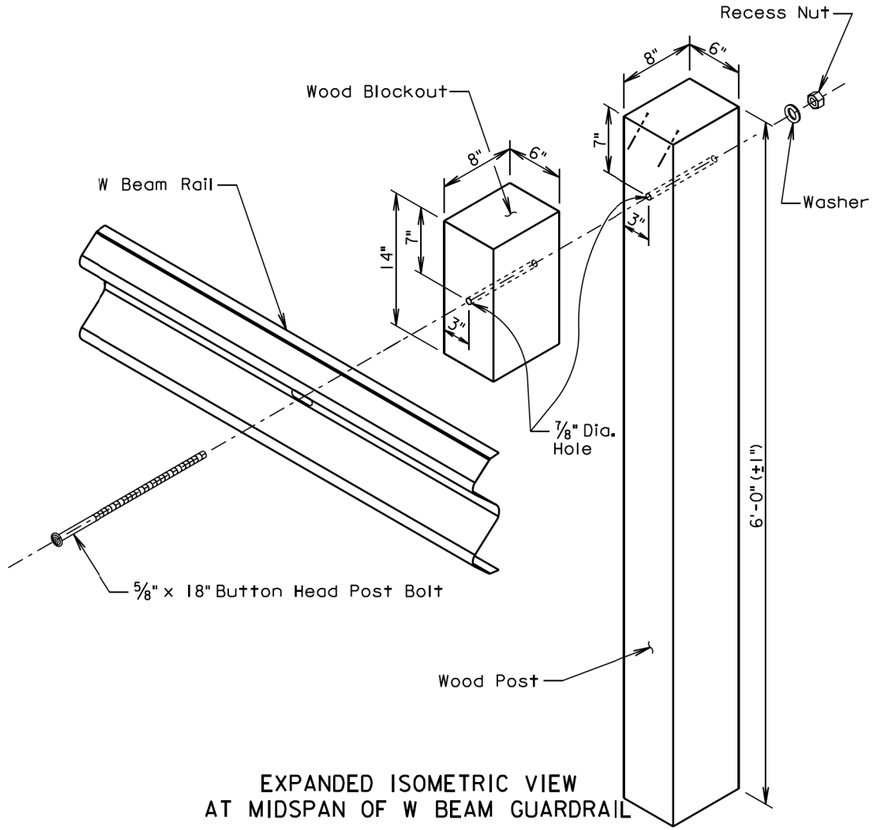
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

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.

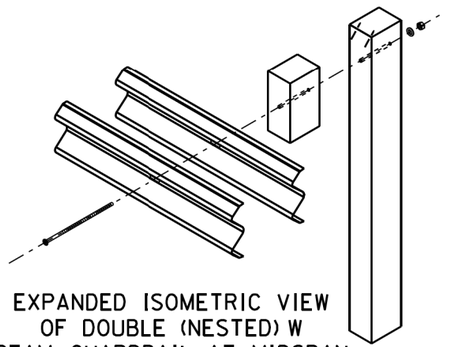
The top of post and top of block shall have a true square cut. The top of block shall be a maximum of ±½ inch from the top of the post.

February 14, 2017

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



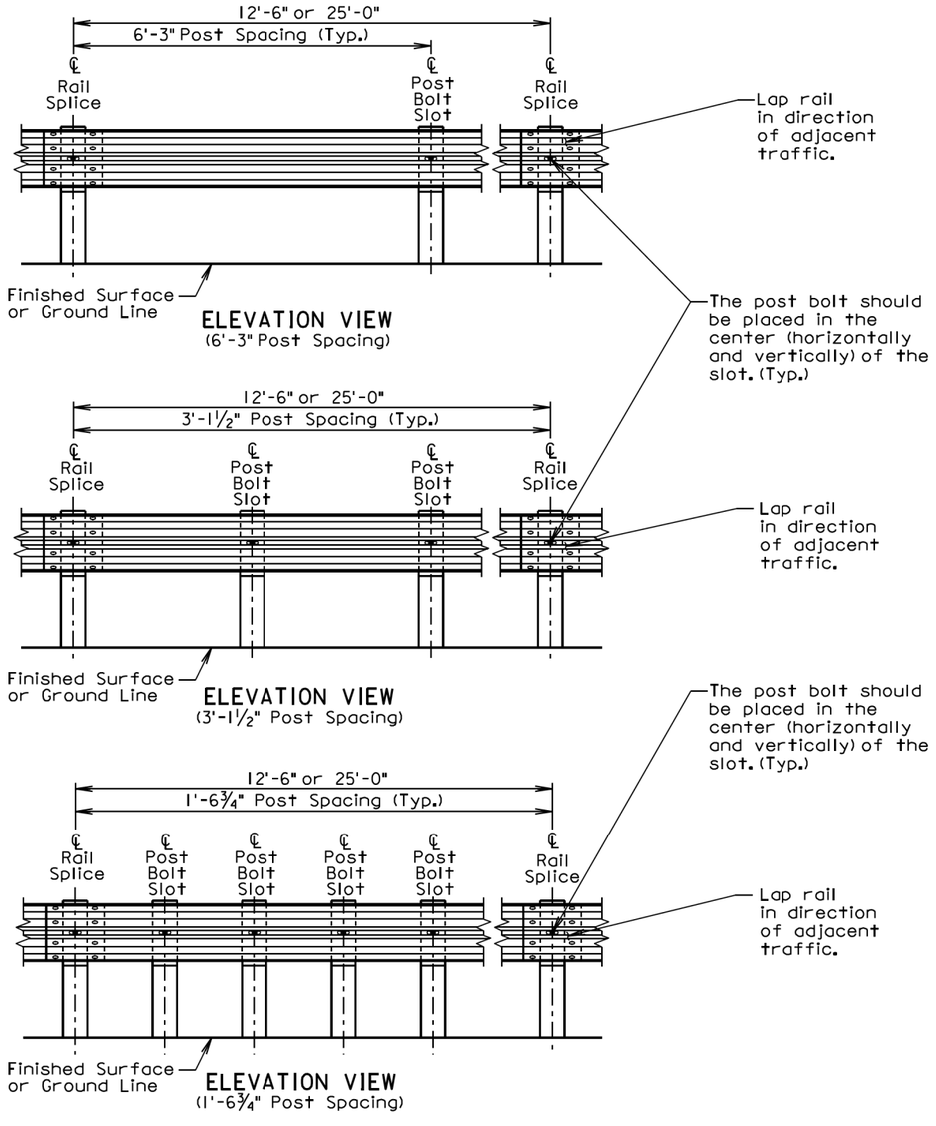
EXPANDED ISOMETRIC VIEW AT MIDSPAN OF W BEAM GUARDRAIL



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

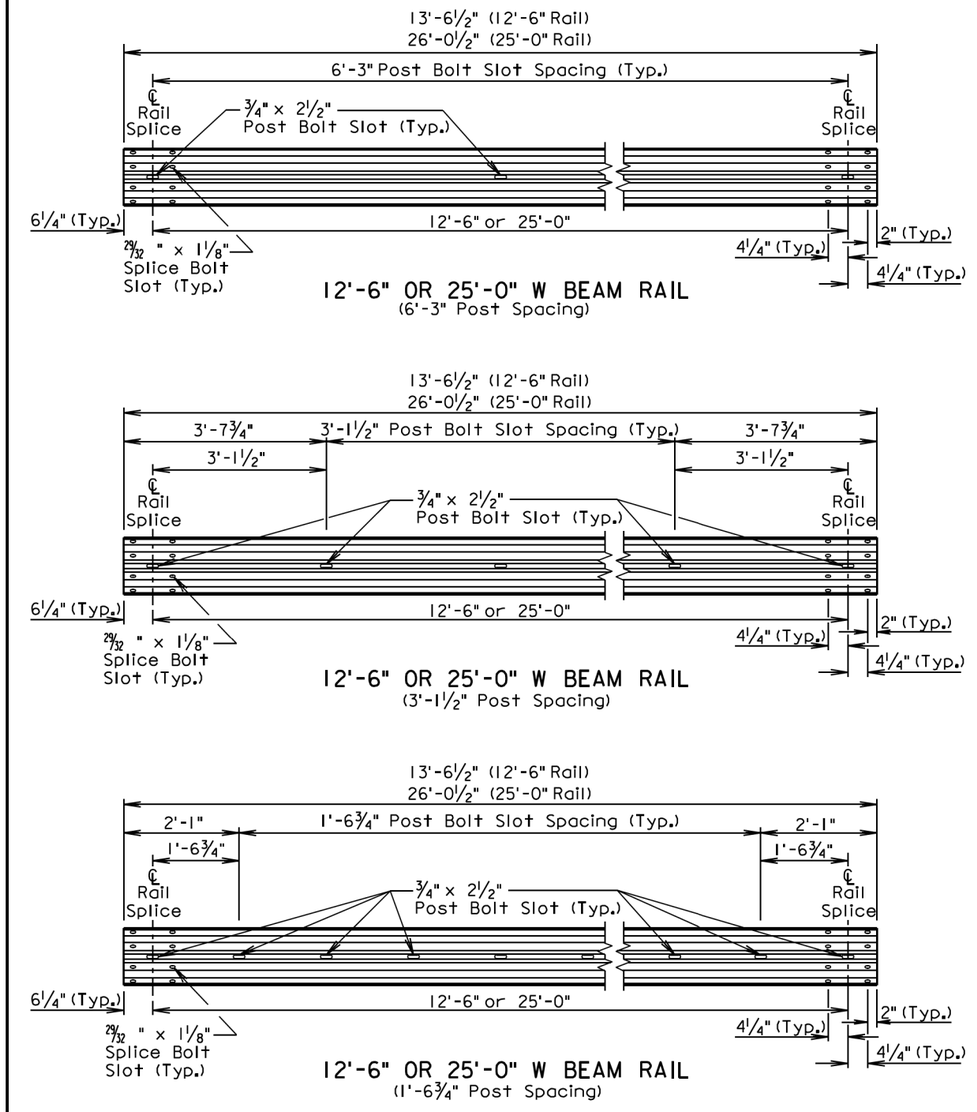
February 14, 2017

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



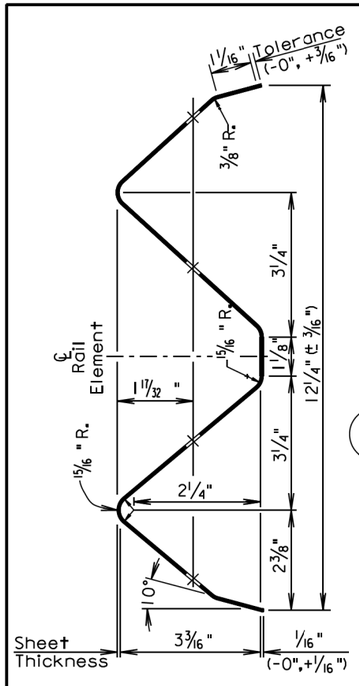
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 3 of 5

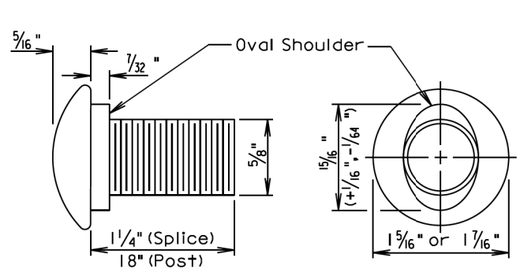


February 14, 2017

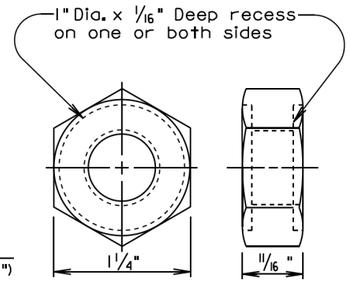
Published Date: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 4 of 5



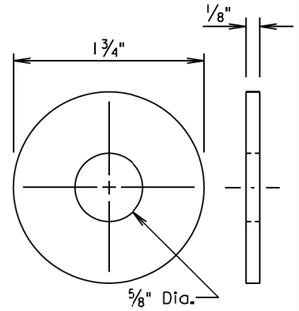
SECTION THROUGH W BEAM RAIL



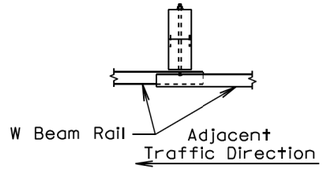
SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)



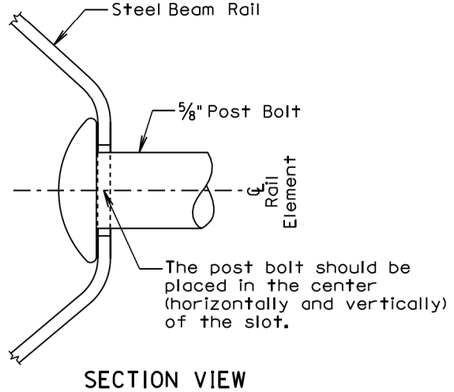
RECESS NUT
(At lap splices, the recess shall be placed against the steel rail.)



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: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 5 of 5

TYPE AND DETAILS OF MGS

Type of MGS	W Beam Rail Single or Double (Nested)	Blockout Size	Blockout Material	Post Size	Post Material	Post Spacing
1	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"
1C	Single	6"x12"x14"	Wood	6"x8"x7'-6"	Wood	6'-3"
2	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	3'-1 1/2"
3	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	1'-6 3/4"
4	Double	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	6'-3"

STANDARD PLATE REFERENCE

Type of MGS	See Standard Plate(s)
1	630.20, 630.22
1C	630.20, 630.25
2	630.20
3	630.20
4	630.20

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 on sheet 2 of 6.

All W beam rail shall be Type 1 and Class A (12 Ga.) unless specified otherwise in the plans.

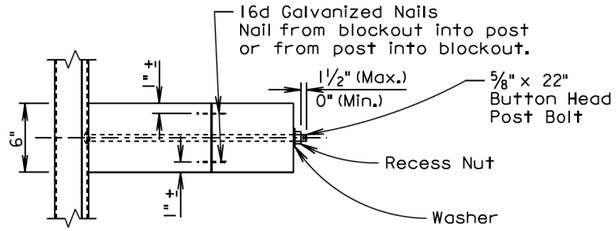
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

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.

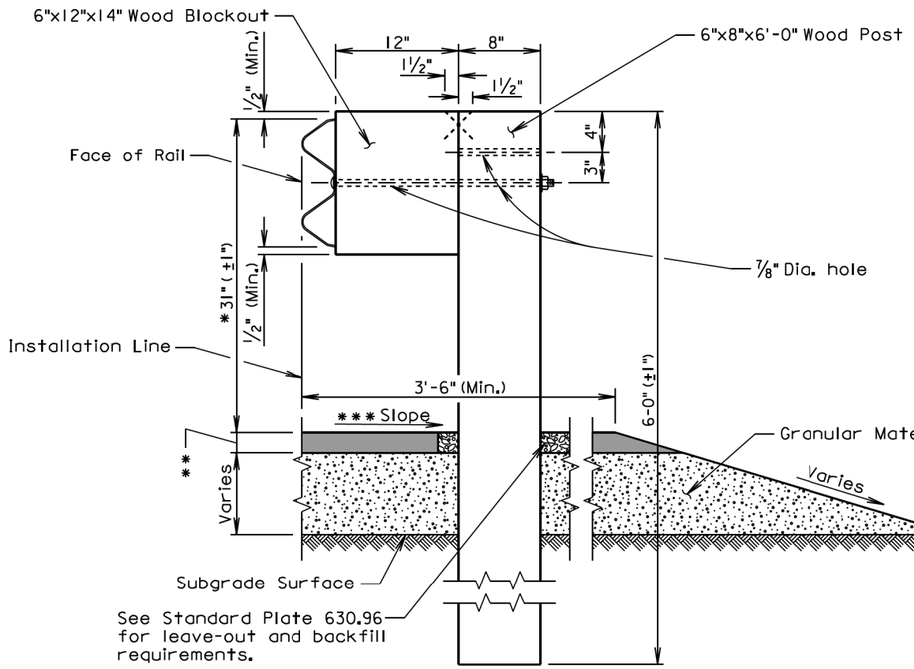
All costs for constructing the MGS including labor, equipment, and materials including all posts, blockouts, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective MGS bid item.

September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6



TOP VIEW
(Type 1, 2, or 3 MGS Installation)



TRANSVERSE SECTION
(Type 1, 2, or 3 MGS Installation)

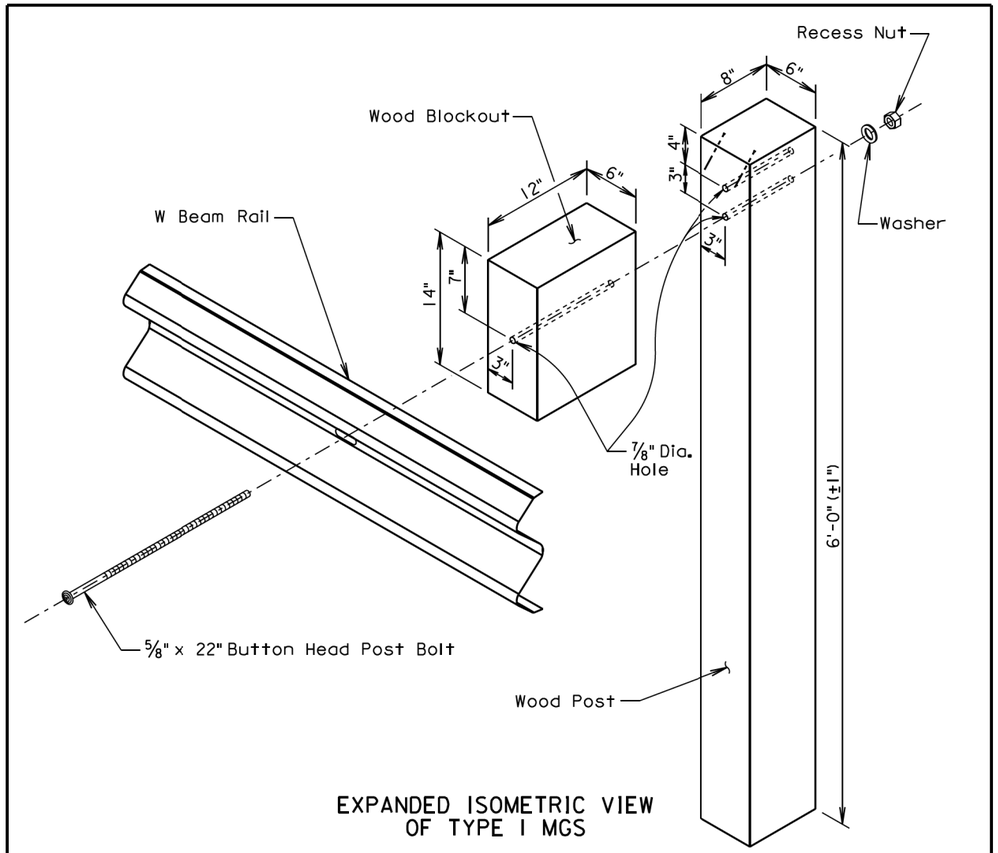
* See Standard Plate 630.99

** 2" asphalt concrete or as specified in the plans.

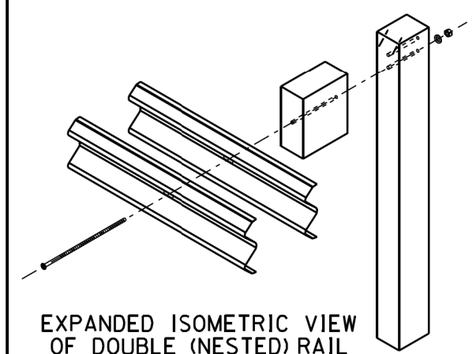
*** The cross slope shall be as specified in the plans; however, the cross slope shall not be steeper than a 10:1 slope.

September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6



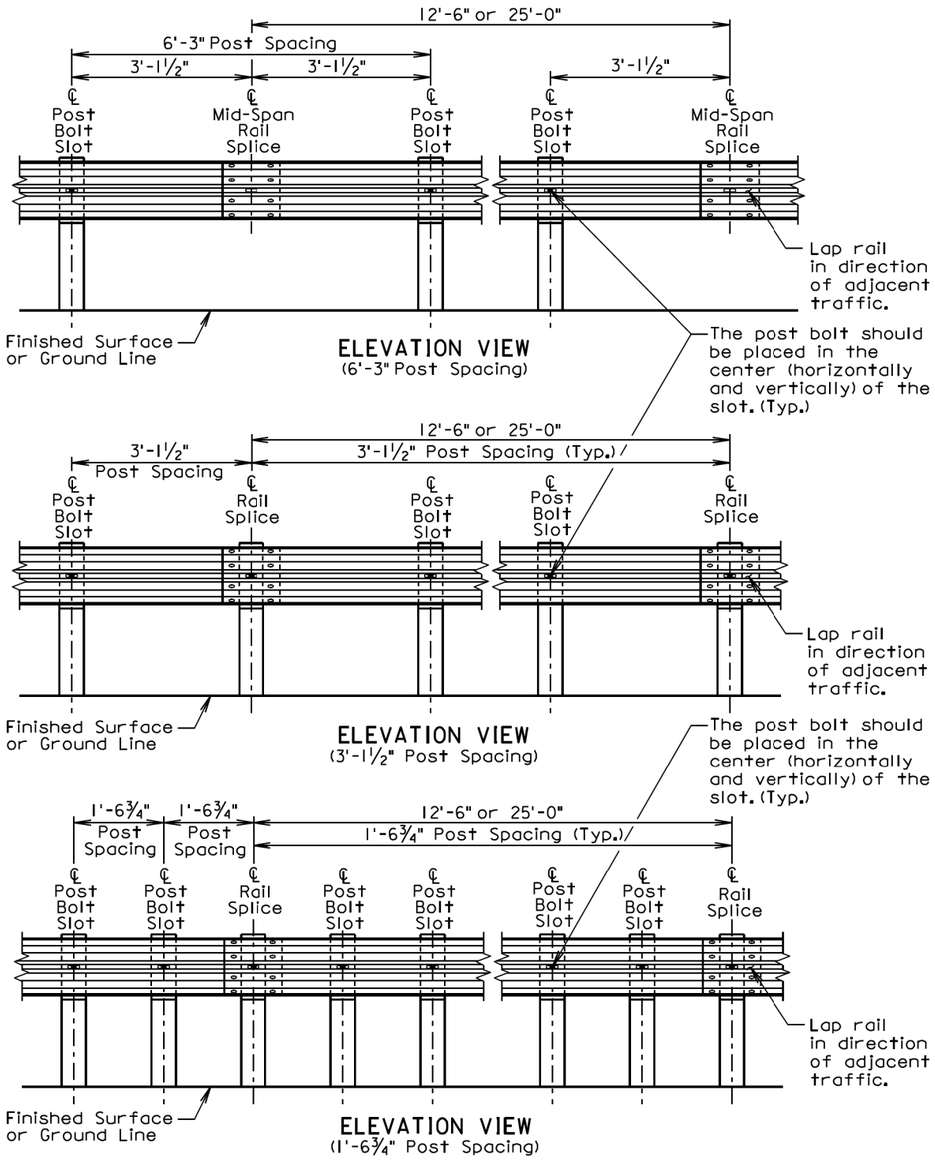
EXPANDED ISOMETRIC VIEW
OF TYPE I MGS



EXPANDED ISOMETRIC VIEW
OF DOUBLE (NESTED) RAIL
(For Information Only, Not to Scale)

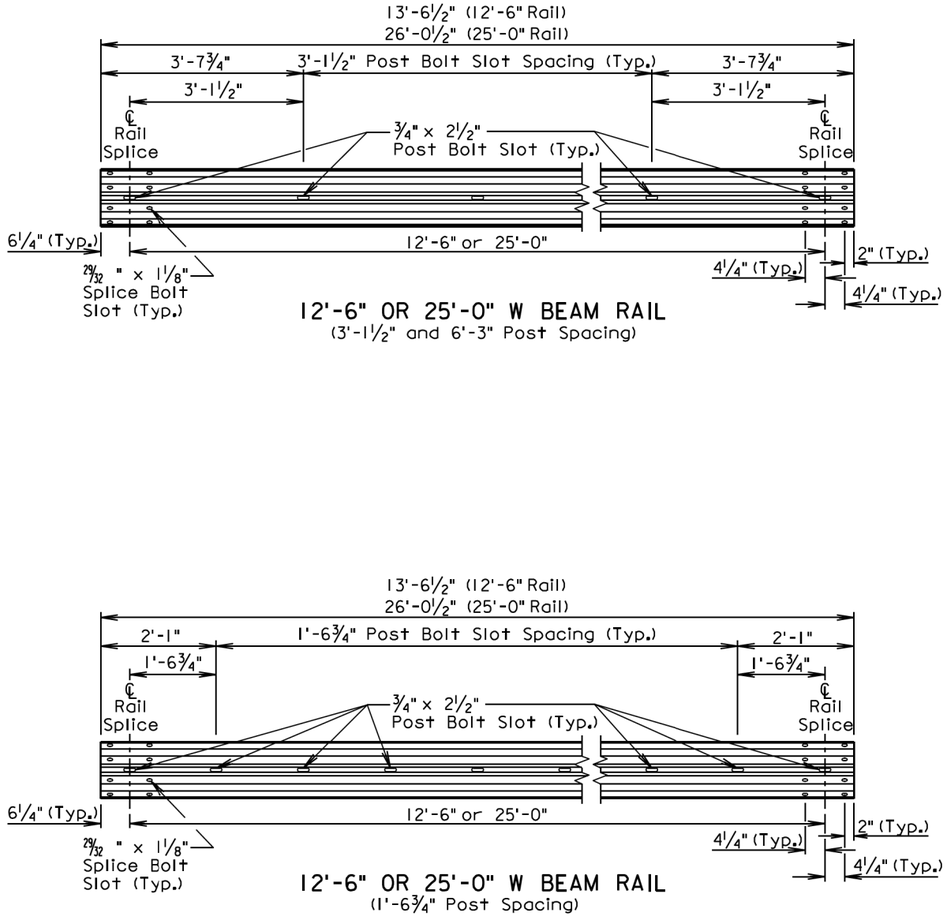
September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 3 of 6



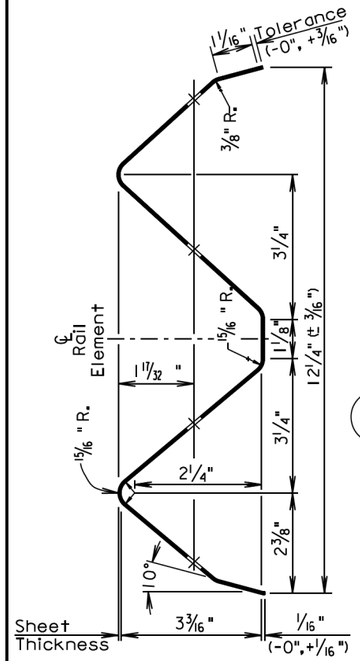
September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 4 of 6

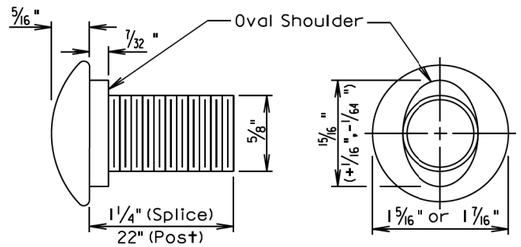


September 14, 2017

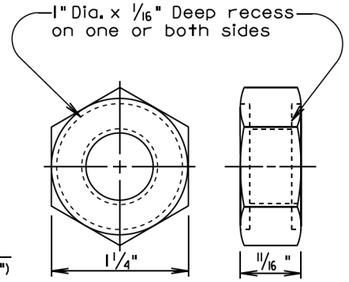
Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 5 of 6



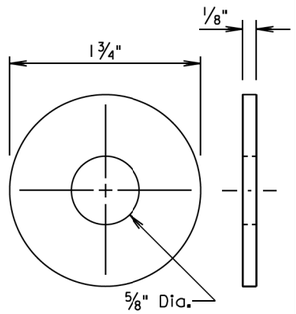
SECTION THROUGH W BEAM RAIL



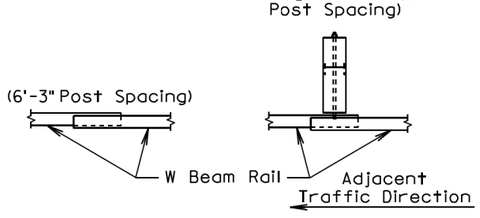
SPLICE BOLT AND POST BOLT
(5/8" Button Head Bolt)



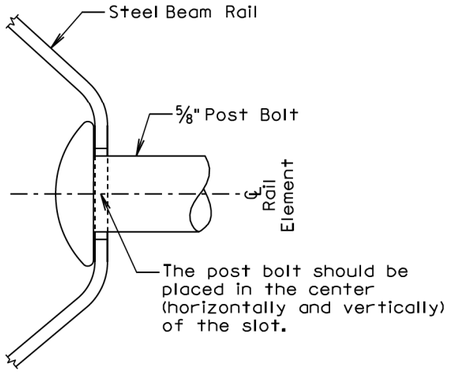
RECESS NUT
(At lap splices, the recess shall be placed against the steel rail.)



WASHER
(The washer shall be placed between the back side of wood post and the recess nut, see sheet 2 and 3.)



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

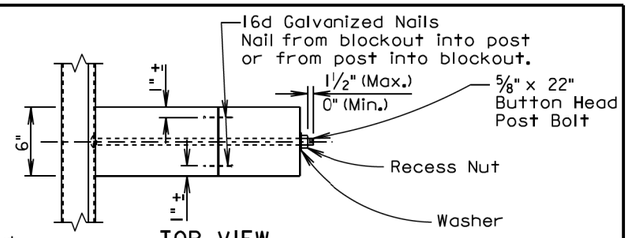


SECTION VIEW
(At Post Bolt)

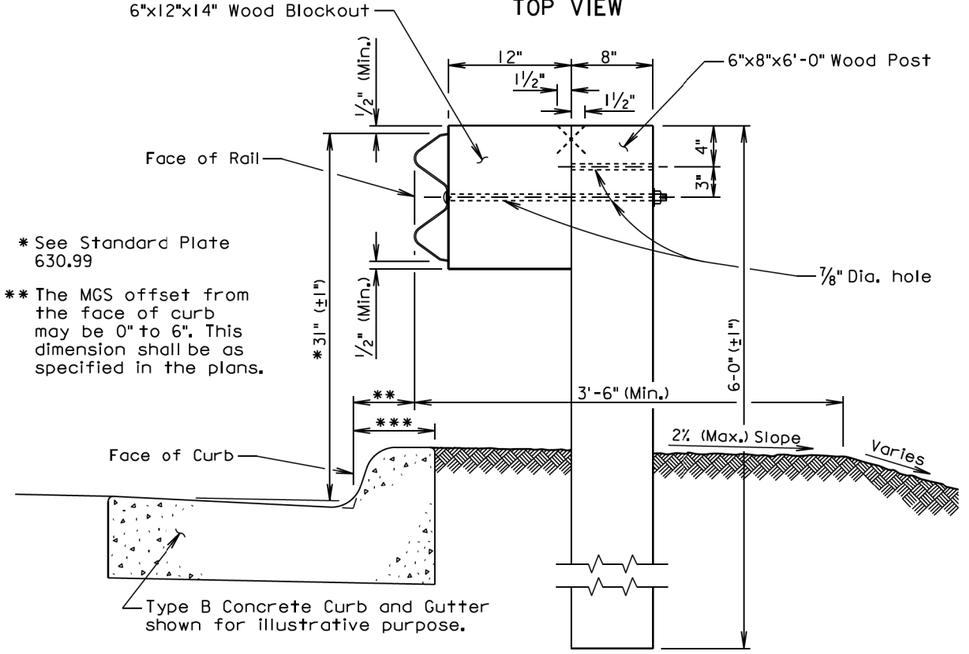
September 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 6 of 6

Concrete Curb and Gutter Type	Dimension *** (In.)
B and BL	8
D	12
F and FL	10
R	11



TOP VIEW



TRANSVERSE SECTION

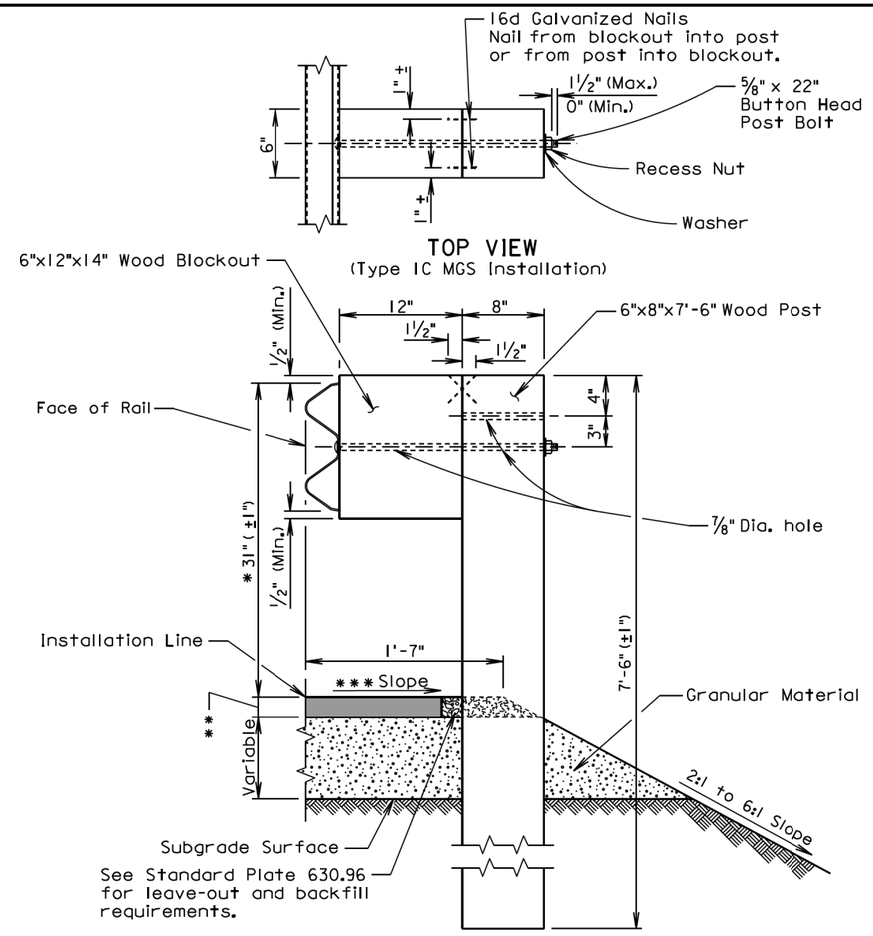
GENERAL NOTES:

The guardrail on this standard plate is Type 1 MGS. See standard plate 630.20 for specifications regarding Type 1 MGS.

When PCC pavement or asphalt concrete pavement is adjacent to the post, see standard plate 630.96 for leave-out and backfill requirements.

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS) AT CURB AND GUTTER	PLATE NUMBER 630.22
			Sheet 1 of 1



TOP VIEW
(Type 1C MGS Installation)

TRANSVERSE SECTION
(Type 1C MGS Installation)

*See Standard Plate 630.99

**2" asphalt concrete or
as specified in the plans.

***The cross slope shall be as specified in the plans; however, the cross slope shall not be steeper than a 10:1 slope.

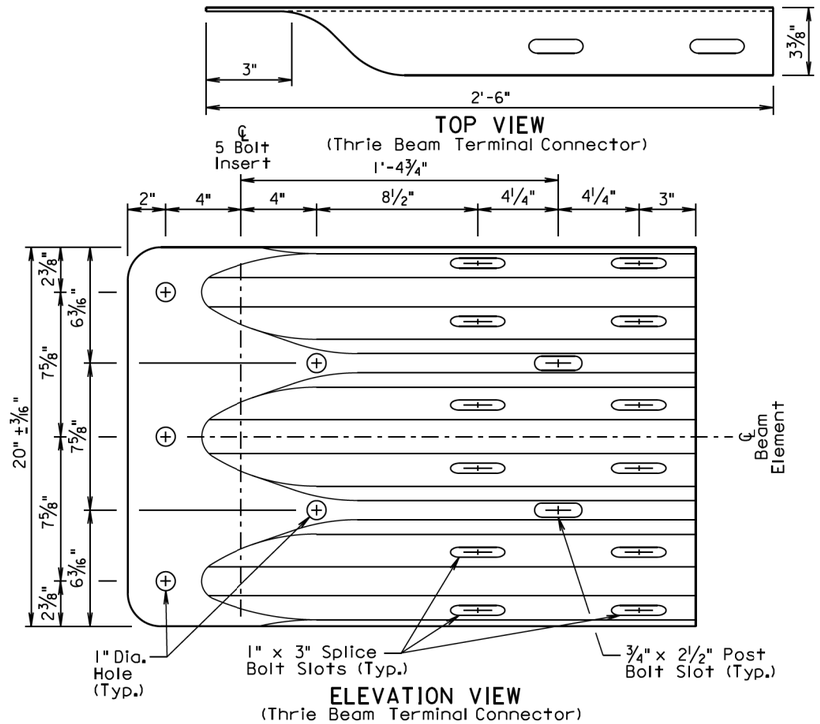
GENERAL NOTES:

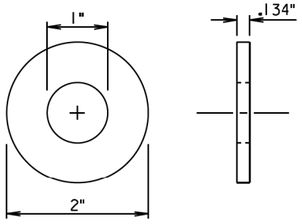
The guardrail on this standard plate is Type 1C MGS. See standard plate 630.20 for specifications regarding Type 1C MGS.

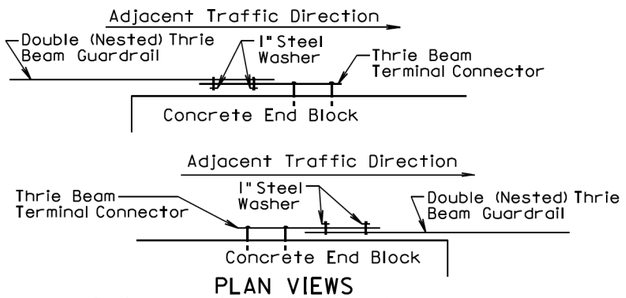
Topsoil is not shown in the transverse section drawing.

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	***TYPE 1C MIDWEST GUARDRAIL SYSTEM (MGS) INSTALLATION AT BREAK POINT OF SLOPE***	***PLATE NUMBER*** 630.25 *Sheet 1 of 1*







GENERAL NOTES:

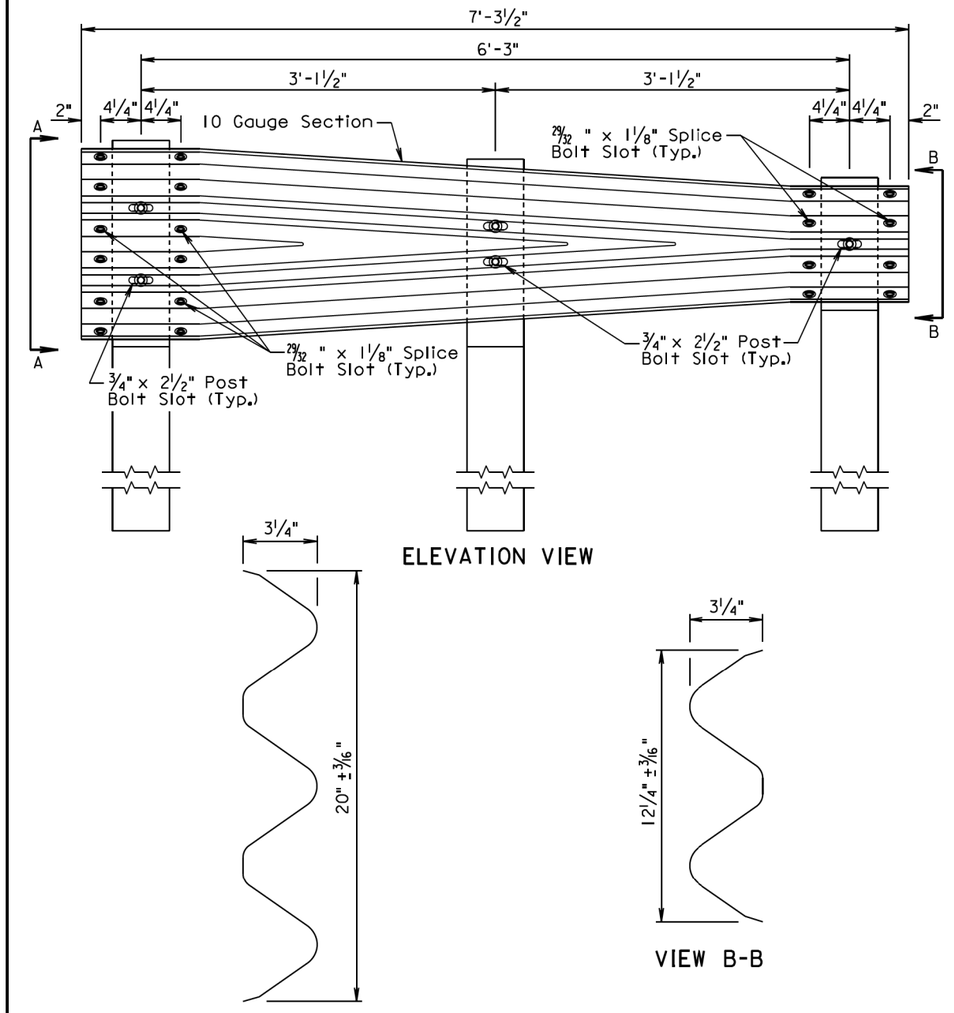
Thrie Beam Terminal Connectors shall be 10 gauge.

When the thrie beam terminal connector is used to connect the rail to the bridge or concrete end block, 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 furnishing and installing the thrie beam terminal connector shall be incidental to the contract unit price of the respective guardrail item it is attached to.

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	***THRIE BEAM TERMINAL CONNECTOR***	***PLATE NUMBER*** 630.47 *Sheet 1 of 1*

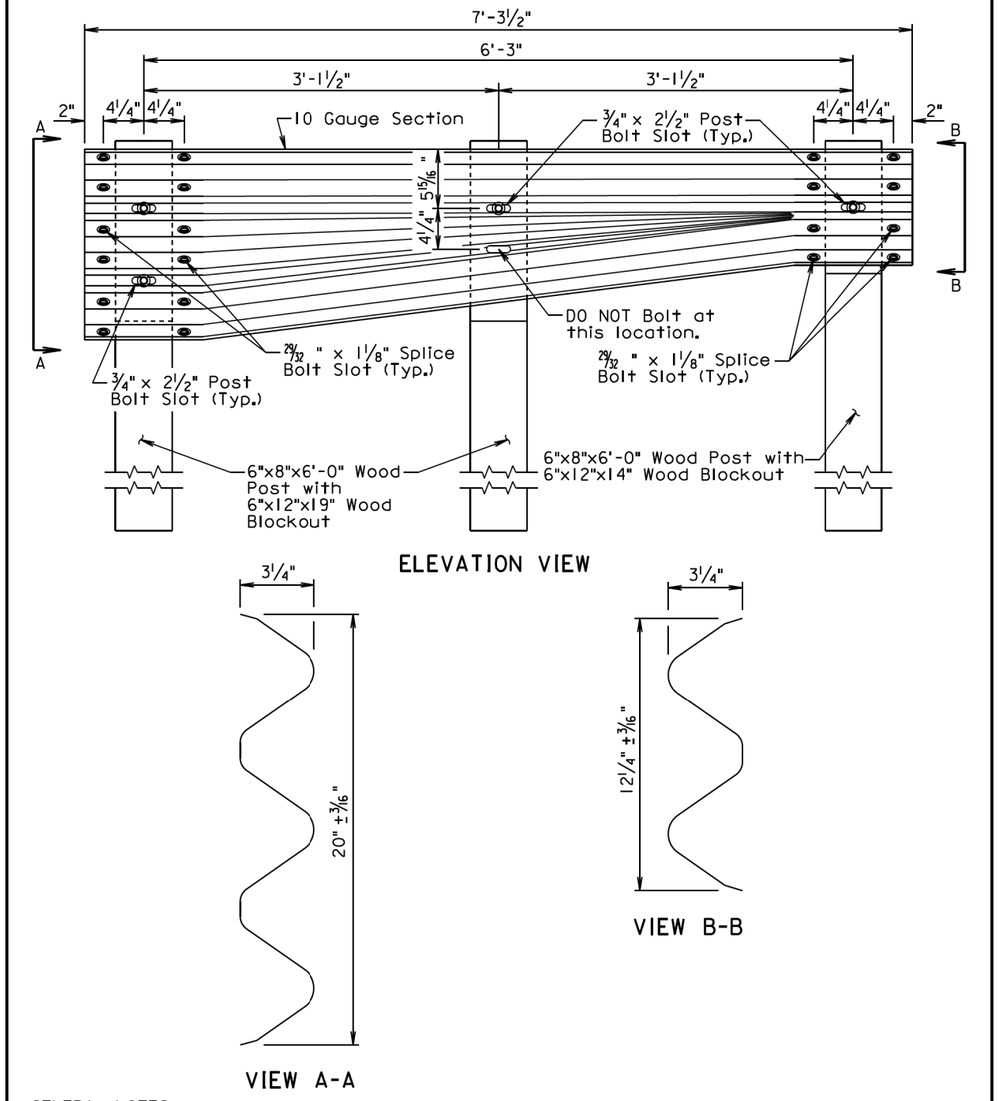


GENERAL NOTES:

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: 1st Qtr. 2018	SDDOT	***W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION***	***PLATE NUMBER*** 630.48 *Sheet 1 of 1*

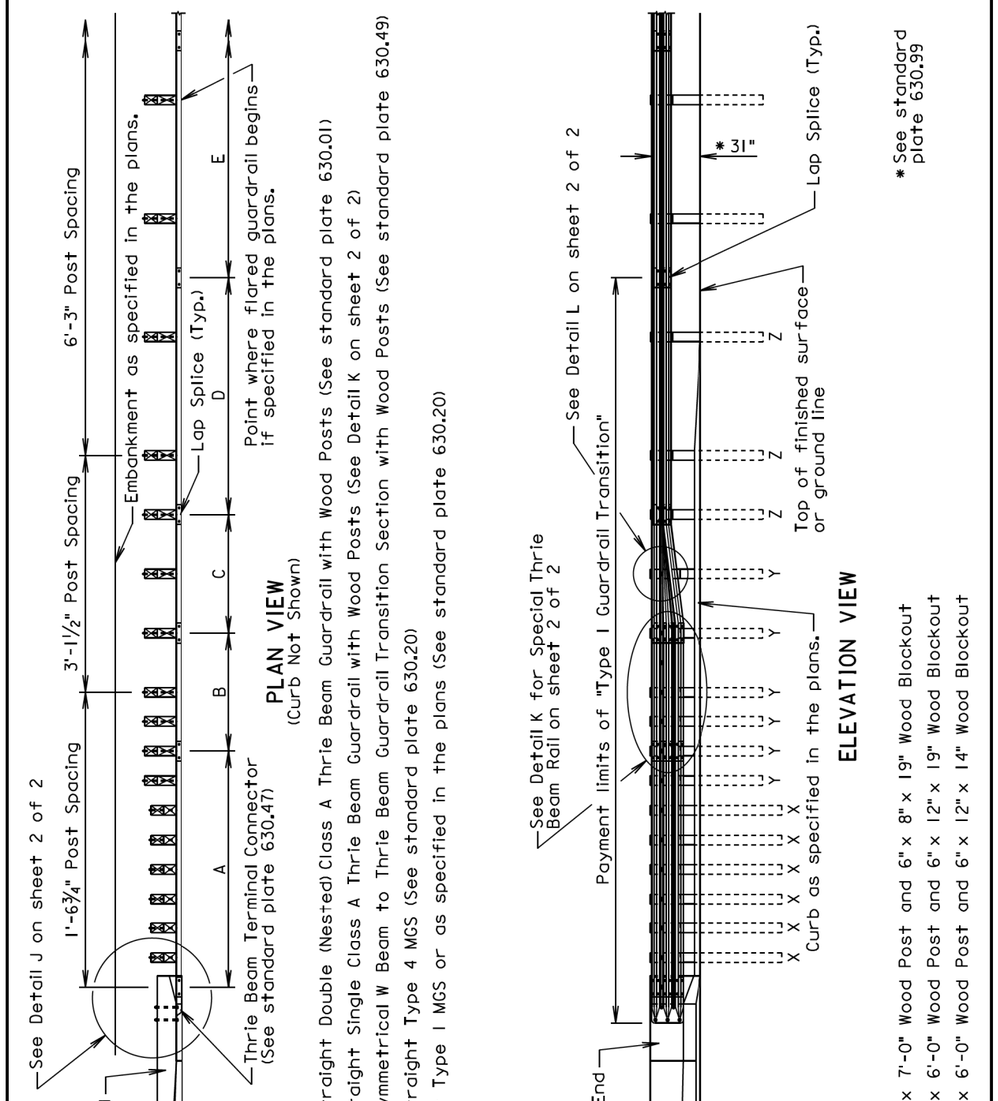


GENERAL NOTES:

All costs for furnishing and installing the asymmetrical W beam to thrie beam guardrail transition including labor, equipment, and materials including two posts, two blocks, asymmetrical W beam to thrie beam transition section, and hardware shall be incidental to the contract unit price per each for the corresponding guardrail transition bid item.

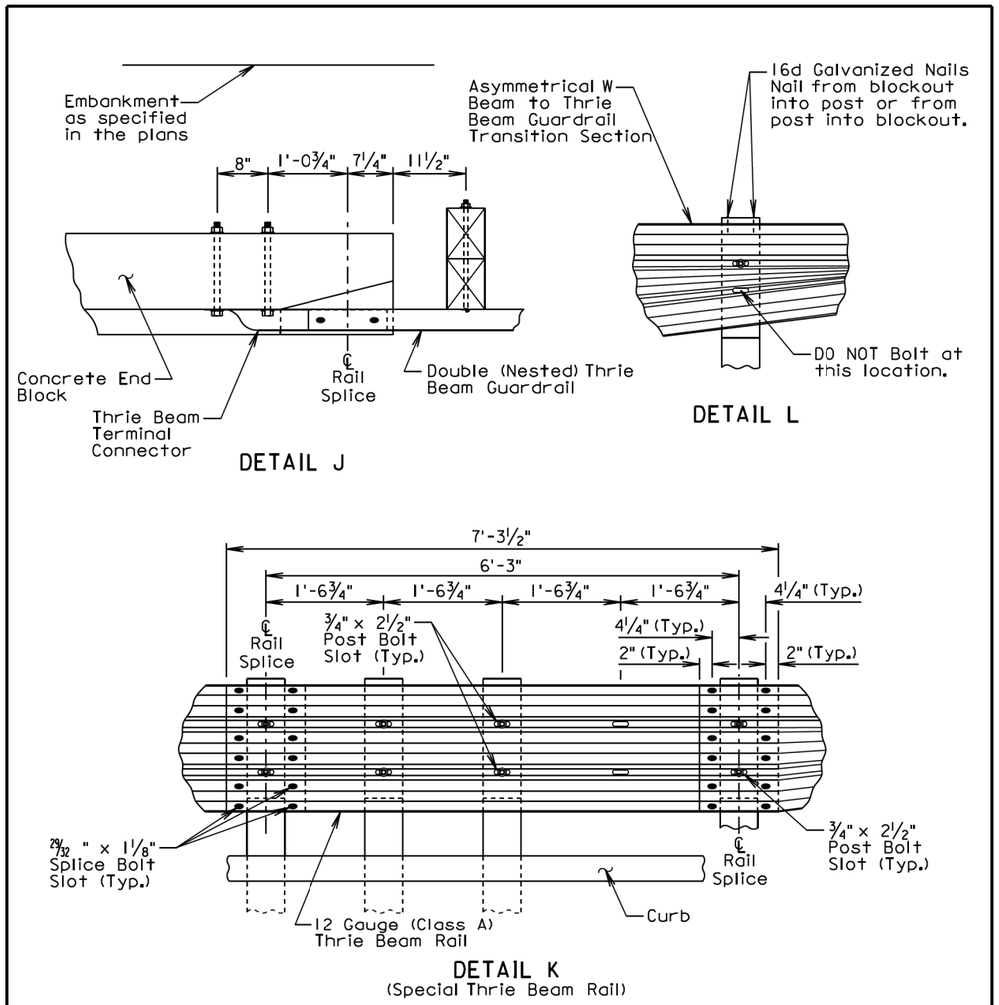
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.49 Sheet 1 of 1



February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.50 Sheet 1 of 2



DETAIL J

DETAIL L

DETAIL K
(Special Thrie Beam Rail)

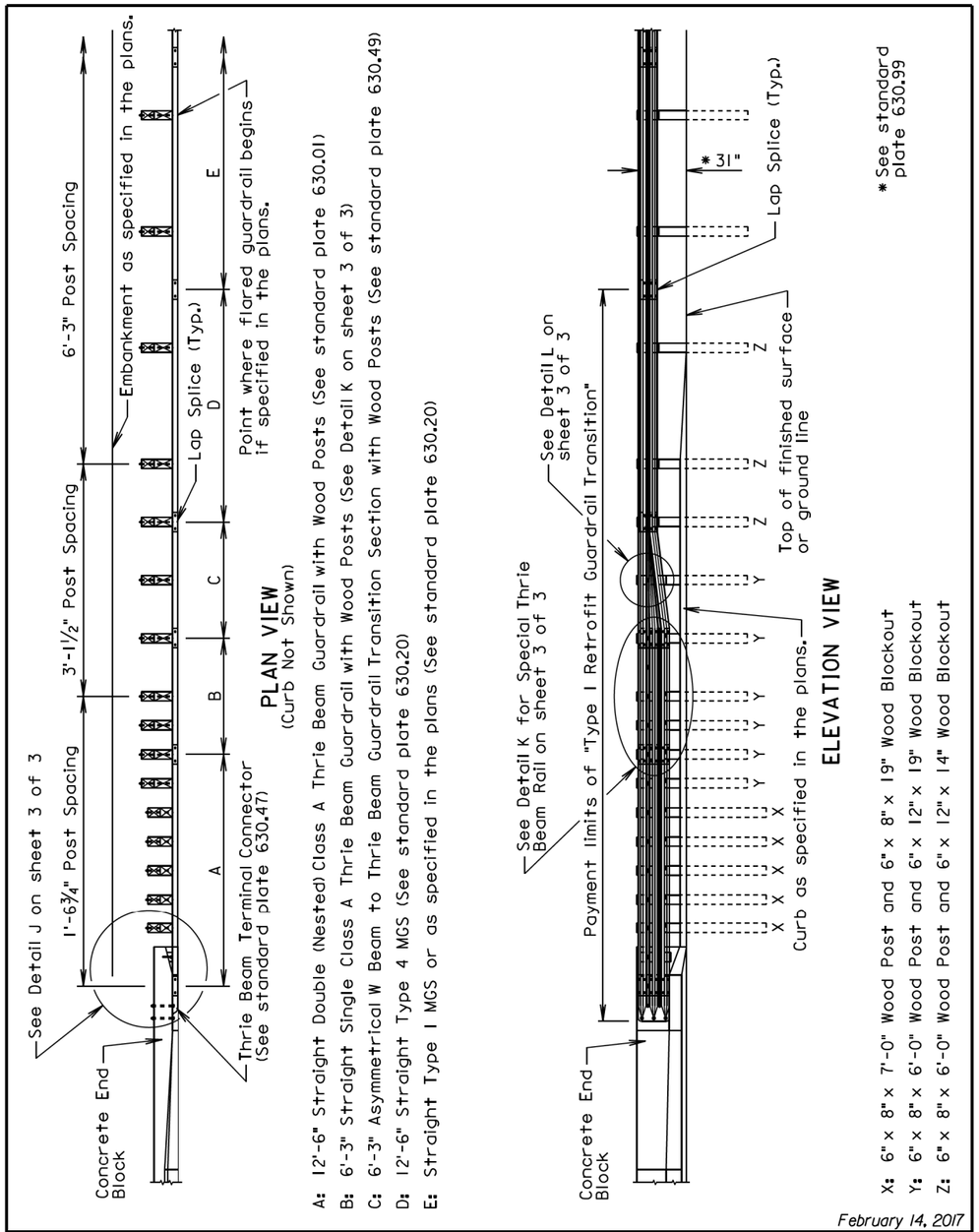
GENERAL NOTES:

Throughout the type 1 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 type 1 guardrail transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, hardware, and incidentals shall be included in the contract unit price per each for "Type 1 Guardrail Transition".

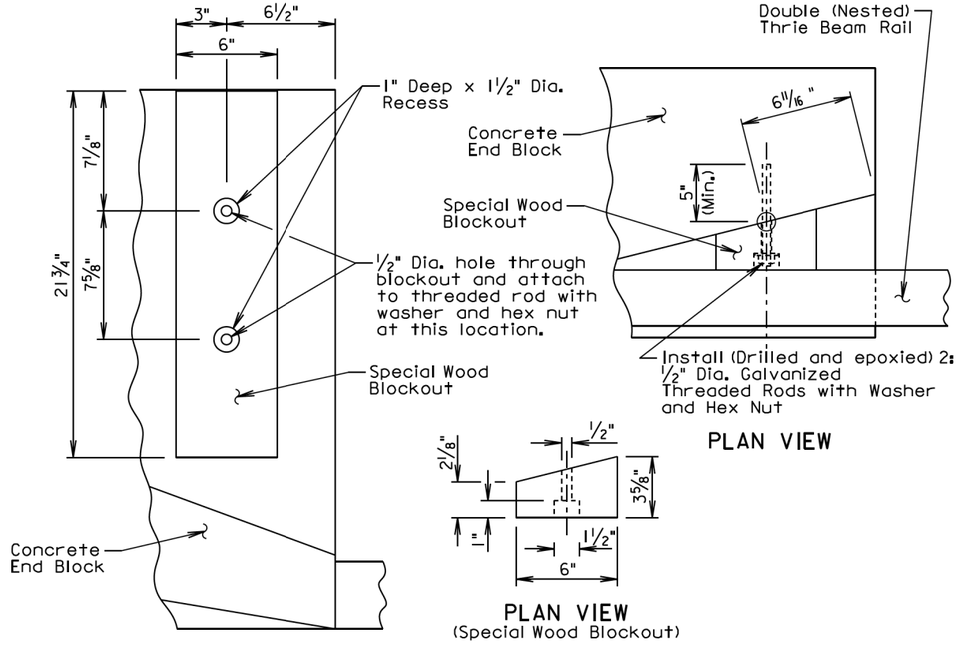
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	*TYPE 1 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))*	*PLATE NUMBER* 630.50
			Sheet 2 of 2



February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	*TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))*	*PLATE NUMBER* 630.51
			Sheet 1 of 3



DETAIL M

(See the 3 drawings above)

GENERAL NOTES FOR INSTALLING THREADED RODS INTO CONCRETE:

The special wood blockout may need to be installed at a different location than what is shown in Detail M as the in place concrete end block may not have been constructed to the exact dimensions. The blockout may be moved in the longitudinal (sideways) direction as necessary such that the blockout rests against the back of the double (nested) thrie beam rail and the rail is straight. The location shall be approved by the Engineer before installation of the blockout.

The threaded rods shall be ½" diameter and conform to ASTM F1554 Grade 55. The threaded rods shall be embedded a minimum of 5" into the concrete.

The diameter of the drilled holes shall not be less than ⅛" greater or more than ⅜" greater than the diameter of the threaded rods or as per the Manufacturer's recommendations. The holes shall not be drilled using core bits. The drilled holes shall be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to the epoxy injection.

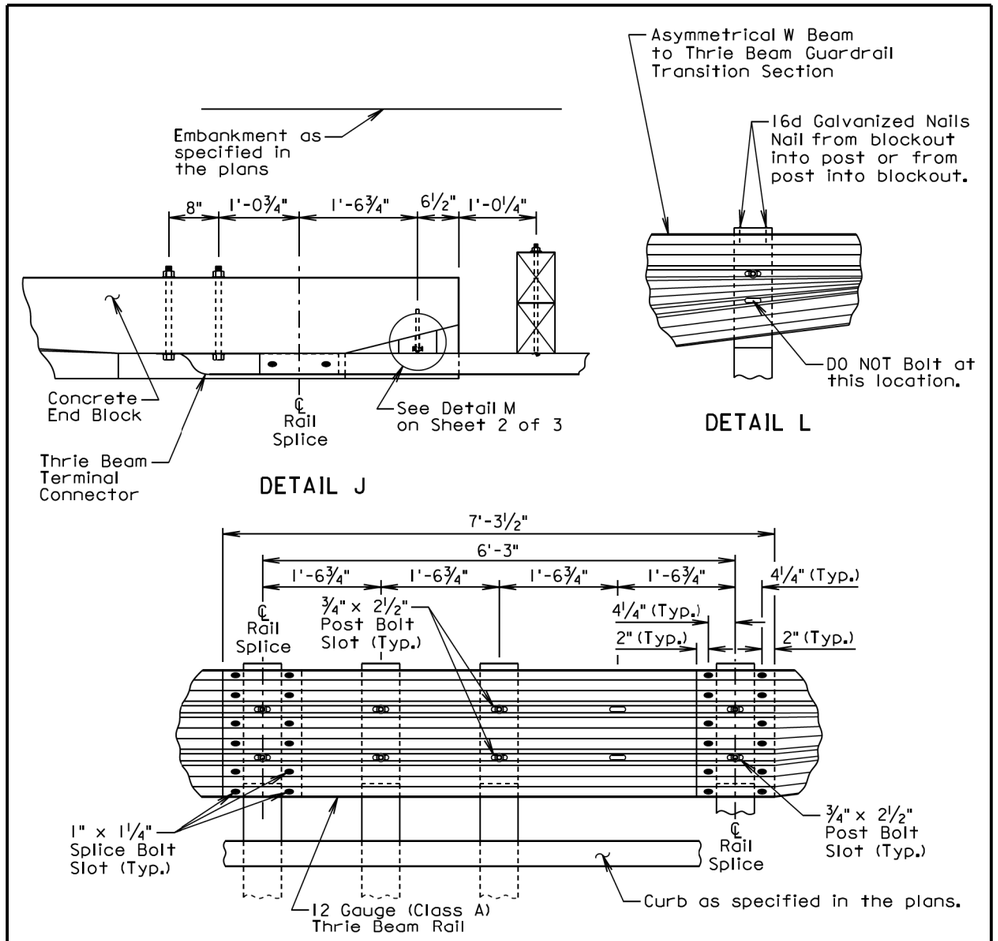
The epoxy resin mixture shall be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).

Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes ⅓ to ½ full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel rod. Rotate the steel rod during installation to eliminate voids and ensure complete bonding of the rod. Insertion of the rods by the dipping or painting methods will not be allowed.

Loads shall not be applied to the epoxy grouted threaded rods until the epoxy resin has had sufficient time to cure as specified by the epoxy resin Manufacturer.

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	**TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))**	PLATE NUMBER 630.51
			Sheet 2 of 3



DETAIL K

(Special Thrie Beam Rail)

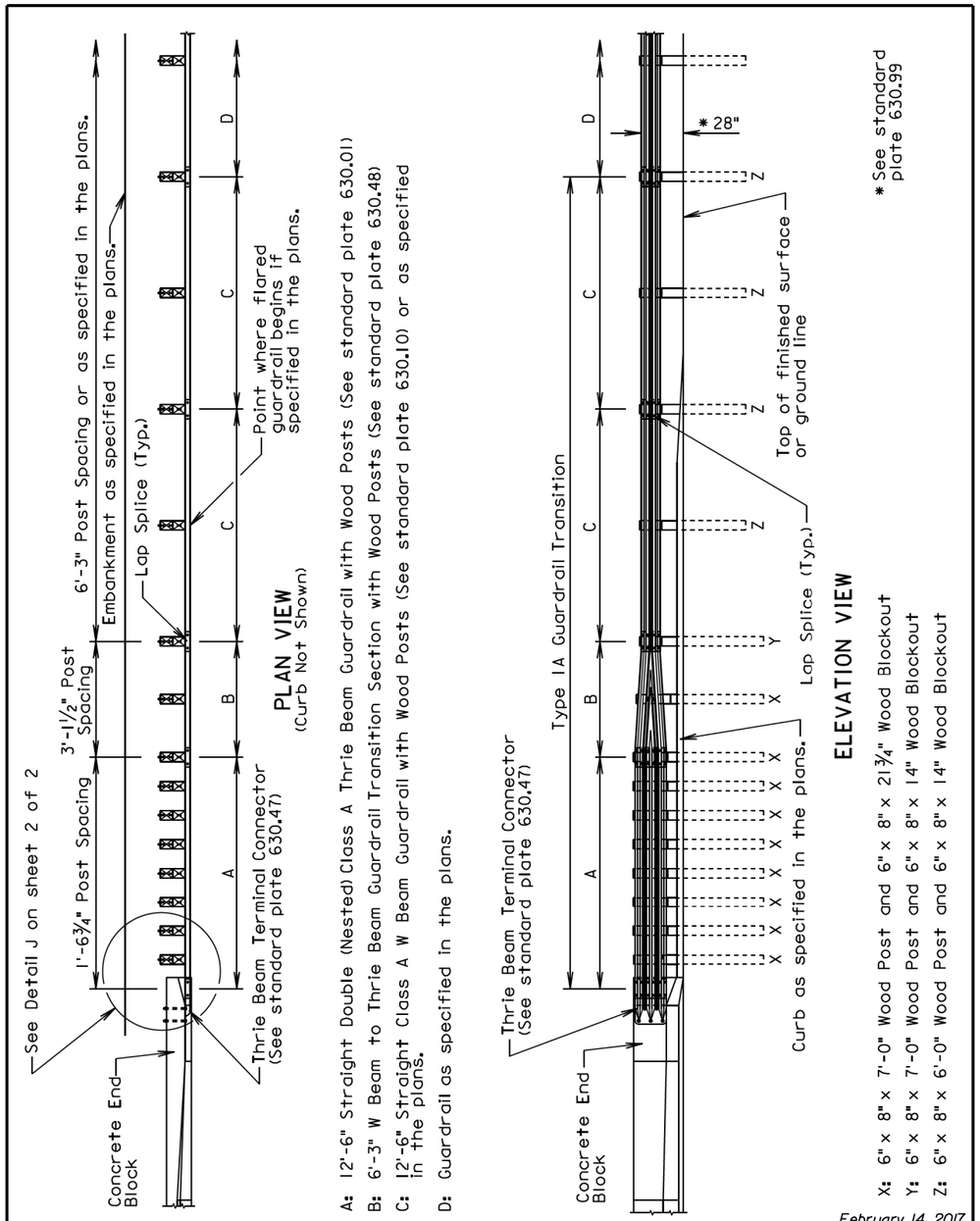
GENERAL NOTES:

Throughout the type 1 retrofit 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 type 1 retrofit guardrail transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, special blockout, hardware, and incidentals shall be included in the contract unit price per each for "Type 1 Retrofit Guardrail Transition".

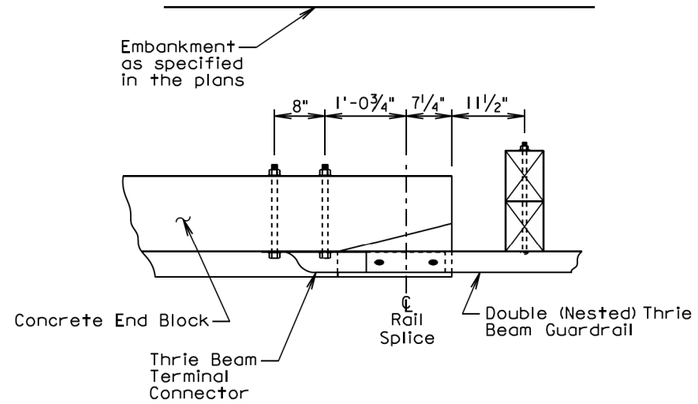
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	**TYPE 1 RETROFIT GUARDRAIL TRANSITION (CONCRETE END BLOCK TO MIDWEST GUARDRAIL SYSTEM (MGS))**	PLATE NUMBER 630.51
			Sheet 3 of 3



February 14, 2017

Published Date: 1st 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".

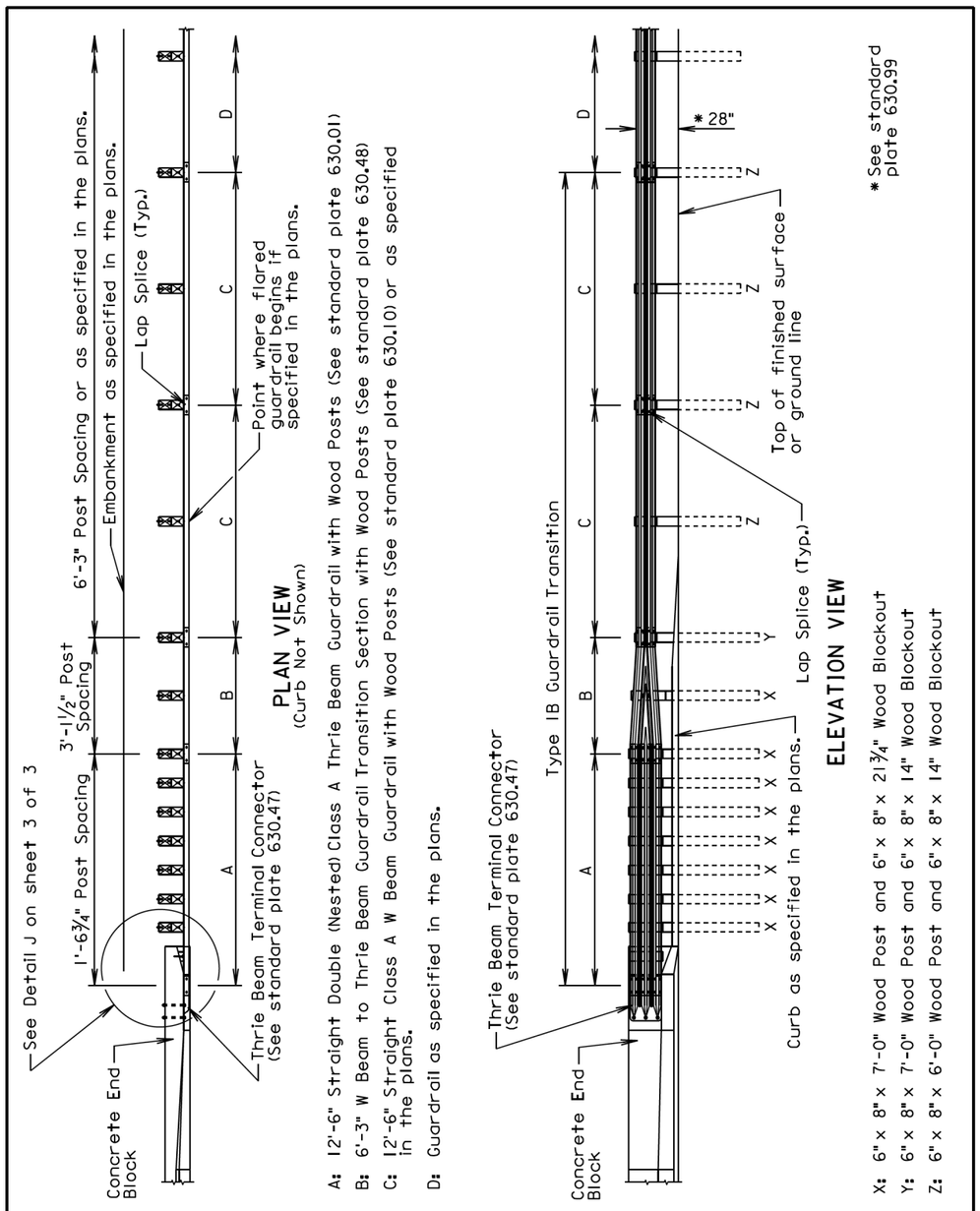
All costs for furnishing and installing the type 1A guardrail transition including labor, equipment, and materials shall be included in the contract unit price for the respective guardrail bid items.

February 14, 2017

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

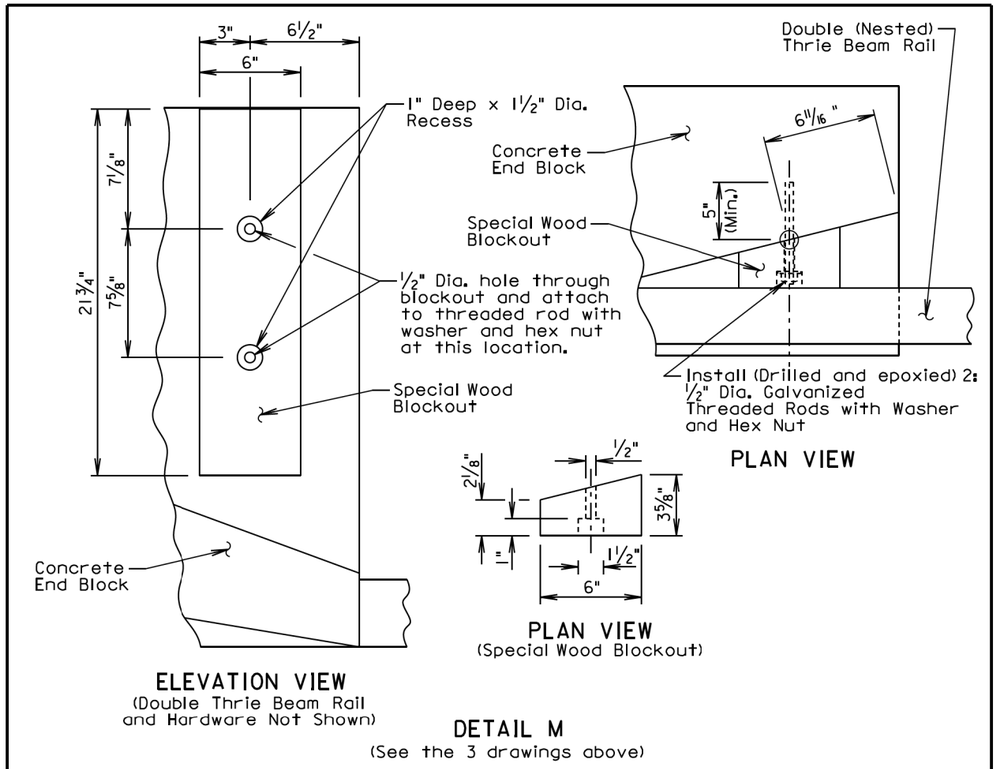
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	34	57

Plotting Date: 03/05/2018



February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	TYPE 1B GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.53
			Sheet 1 of 3



DETAIL M
(See the 3 drawings above)

GENERAL NOTES FOR INSTALLING THREADED RODS INTO CONCRETE:

The special wood blockout may need to be installed at a different location than what is shown in Detail M as the in place concrete end block may not have been constructed to the exact dimensions. The blockout may be moved in the longitudinal (sideways) direction as necessary such that the blockout rests against the back of the double (nested) thrie beam rail and the rail is straight. The location shall be approved by the Engineer before installation of the blockout.

The threaded rods shall be ½" diameter and conform to ASTM F1554 Grade 55. The threaded rods shall be embedded a minimum of 5" into the concrete.

The diameter of the drilled holes shall not be less than ⅛" greater or more than ⅜" greater than the diameter of the threaded rods or as per the Manufacturer's recommendations. The holes shall not be drilled using core bits. The drilled holes shall be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to the epoxy injection.

The epoxy resin mixture shall be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).

Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes ⅓ to ½ full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel rod. Rotate the steel rod during installation to eliminate voids and ensure complete bonding of the rod. Insertion of the rods by the dipping or painting methods will not be allowed.

Loads shall not be applied to the epoxy grouted threaded rods until the epoxy resin has had sufficient time to cure as specified by the epoxy resin Manufacturer.

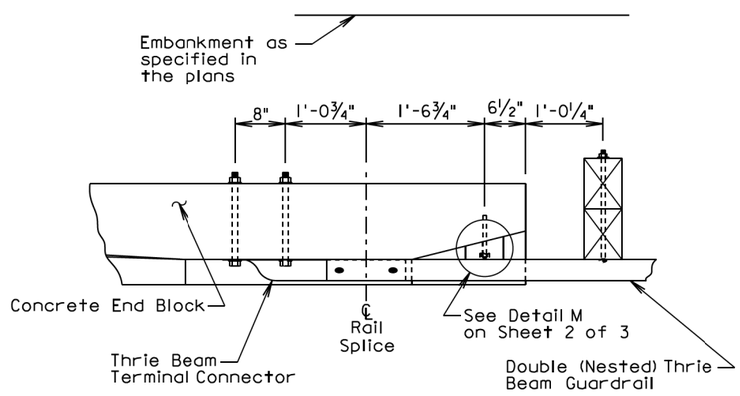
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	TYPE 1B GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.53
			Sheet 2 of 3

Plot Scale - 1:200

- Plotted From - trwi1n123

File - ...\Working\Standard Plates.dgn



DETAIL J

GENERAL NOTES:

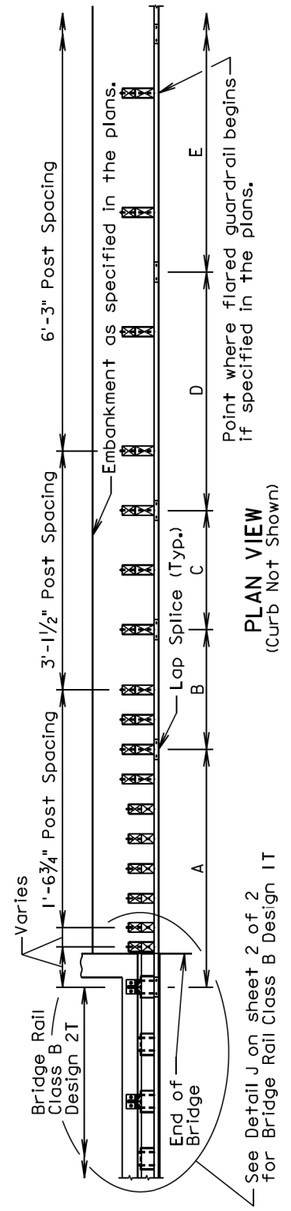
Throughout the type 1B guardrail transition, slots in the rails shall be provided as specified in the plans and by the Manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot 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, special blockout, 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 1B 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: 1st Qtr. 2018	SDDOT	TYPE 1B GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.53
			Sheet 3 of 3



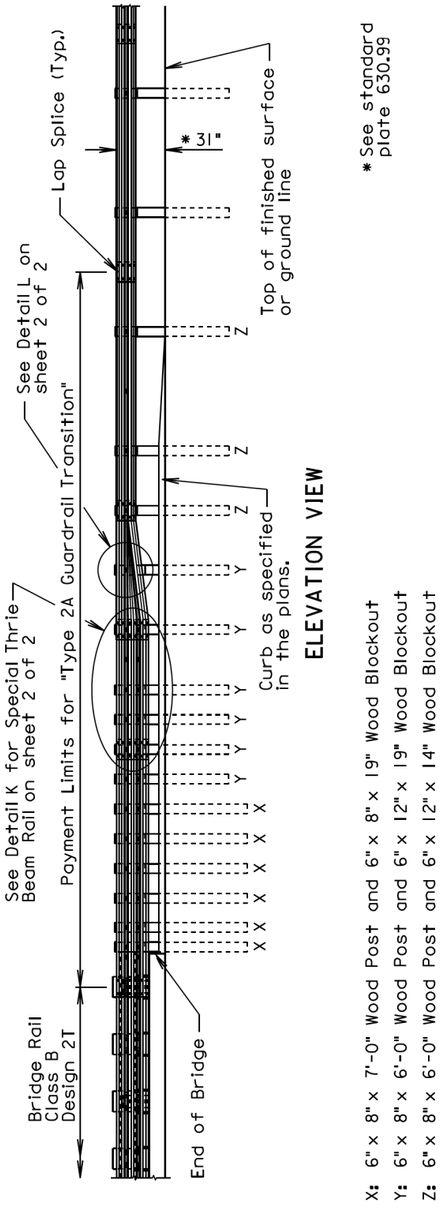
A: 12'-6" Straight Double (Nested) Class A Thrie Beam Guardrail with Wood Posts (See standard plate 630.01)

B: 6'-3" Straight Single Class A Thrie Beam Guardrail with Wood Posts (See Detail K on sheet 2 of 2)

C: 6'-3" Asymmetrical W Beam to Thrie Beam Guardrail Transition Section with Wood Posts (See standard plate 630.49)

D: 12'-6" Straight Type 4 MGS (See standard plate 630.20)

E: Straight Type 1 MGS or as specified in the plans (See standard plate 630.20)



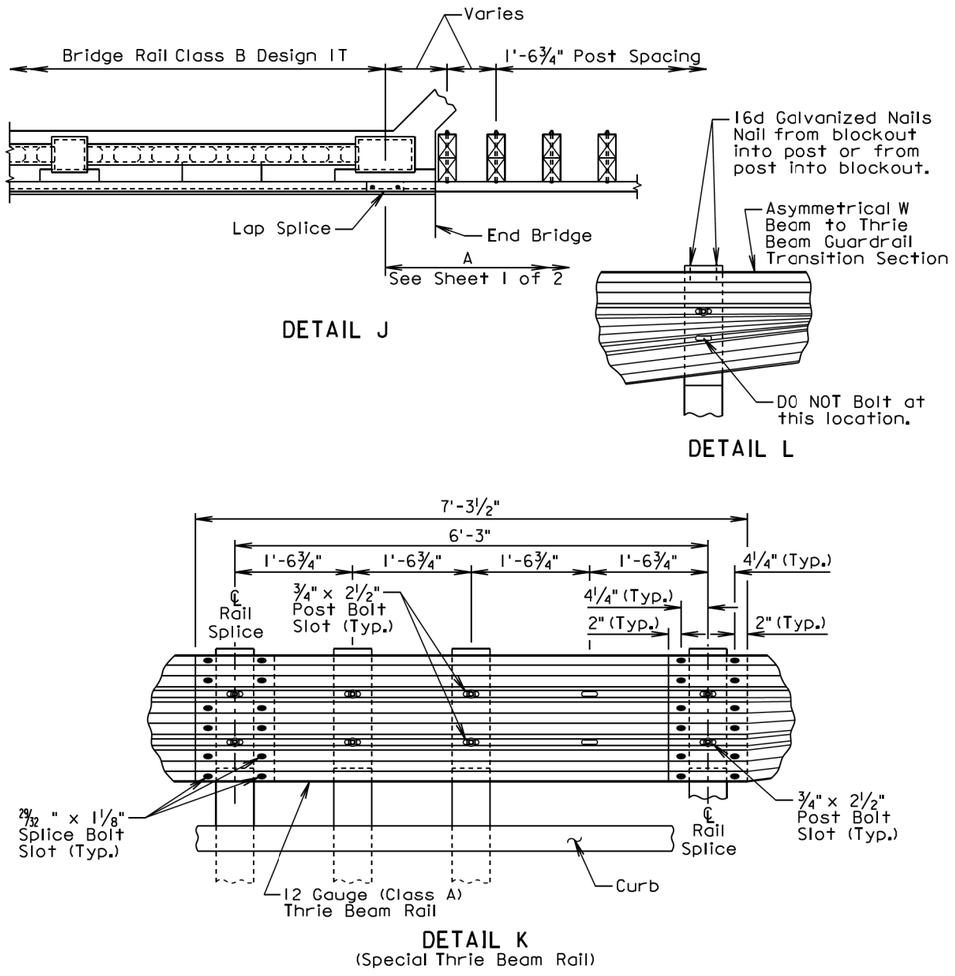
X: 6" x 8" x 7'-0" Wood Post and 6" x 8" x 19" Wood Blockout

Y: 6" x 8" x 6'-0" Wood Post and 6" x 12" x 19" Wood Blockout

Z: 6" x 8" x 6'-0" Wood Post and 6" x 12" x 14" Wood Blockout

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	TYPE 2A GUARDRAIL TRANSITION (BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO MIDWEST GUARDRAIL SYSTEM (MGS))	PLATE NUMBER 630.54
			Sheet 1 of 2



DETAIL J

DETAIL L

DETAIL K
(Special Thrie Beam Rail)

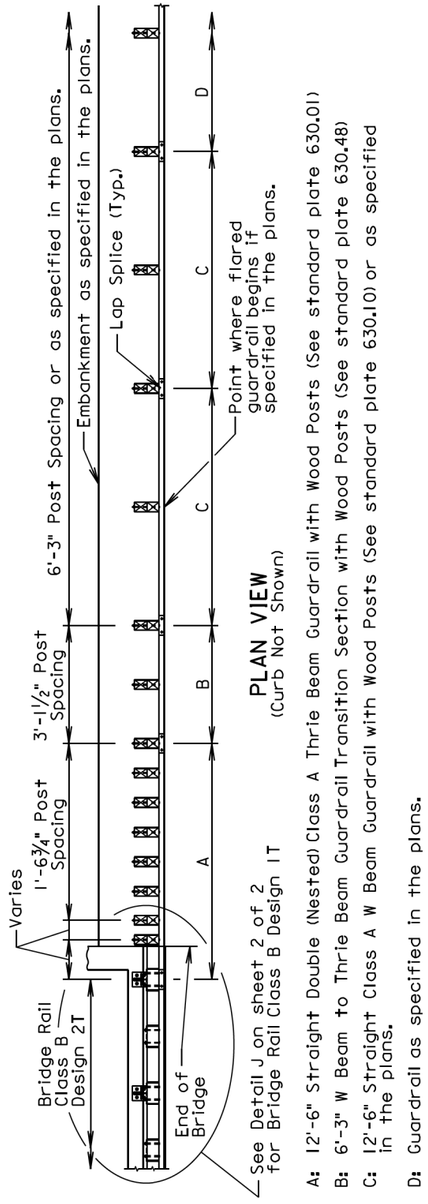
GENERAL NOTES:

Throughout the type 2A 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 type 2A guardrail transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, hardware, and incidentals shall be included in the contract unit price per each for "Type 2A Guardrail Transition".

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	***TYPE 2A GUARDRAIL TRANSITION (BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO MIDWEST GUARDRAIL SYSTEM (MGS))***	***PLATE NUMBER 630.54*** *Sheet 2 of 2*



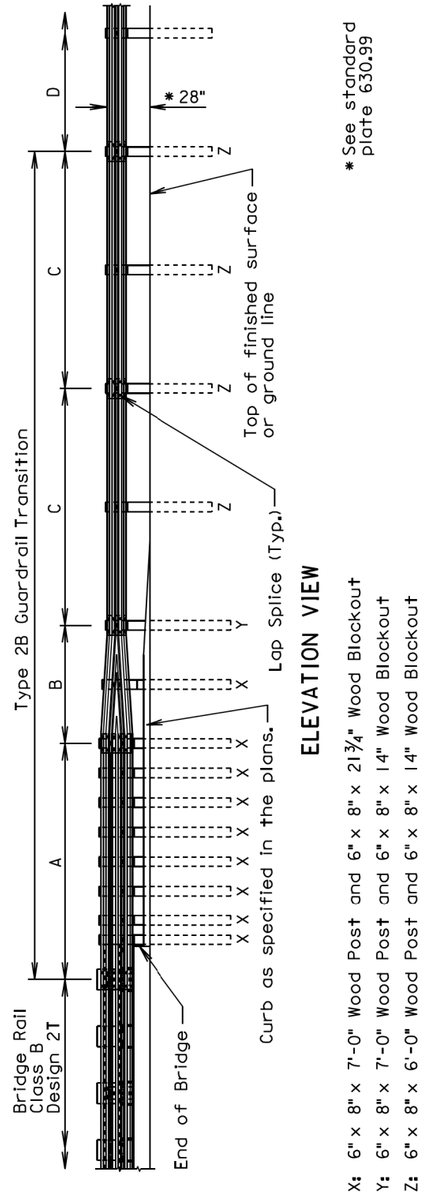
PLAN VIEW
(Curb Not Shown)

A: 12'-6" Straight Double (Nested) Class A Thrie Beam Guardrail with Wood Posts (See standard plate 630.01)

B: 6'-3" W Beam to Thrie Beam Guardrail Transition Section with Wood Posts (See standard plate 630.48)

C: 12'-6" Straight Class A W Beam Guardrail with Wood Posts (See standard plate 630.10) or as specified in the plans.

D: Guardrail as specified in the plans.



* See standard plate 630.99

ELEVATION VIEW

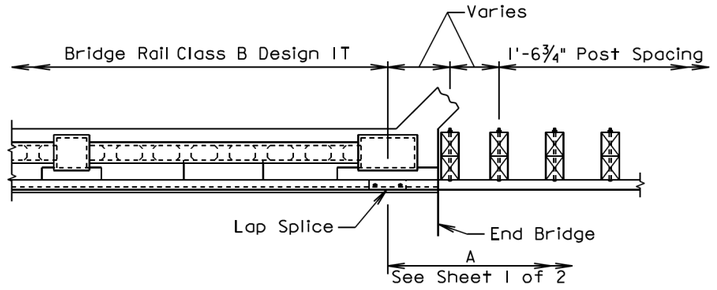
X: 6" x 8" x 7'-0" Wood Post and 6" x 8" x 21¾" Wood Blockout

Y: 6" x 8" x 7'-0" Wood Post and 6" x 8" x 14" Wood Blockout

Z: 6" x 8" x 6'-0" Wood Post and 6" x 8" x 14" Wood Blockout

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	***TYPE 2B GUARDRAIL TRANSITION (BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO W BEAM GUARDRAIL)***	***PLATE NUMBER 630.55*** *Sheet 1 of 2*



DETAIL J

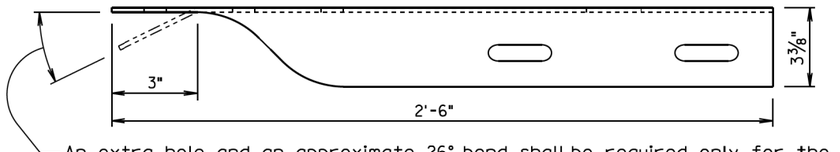
GENERAL NOTES:

Throughout the type 2B 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 type 2B guardrail transition including labor, equipment, and materials shall be included in the contract unit price for the respective guardrail bid items.

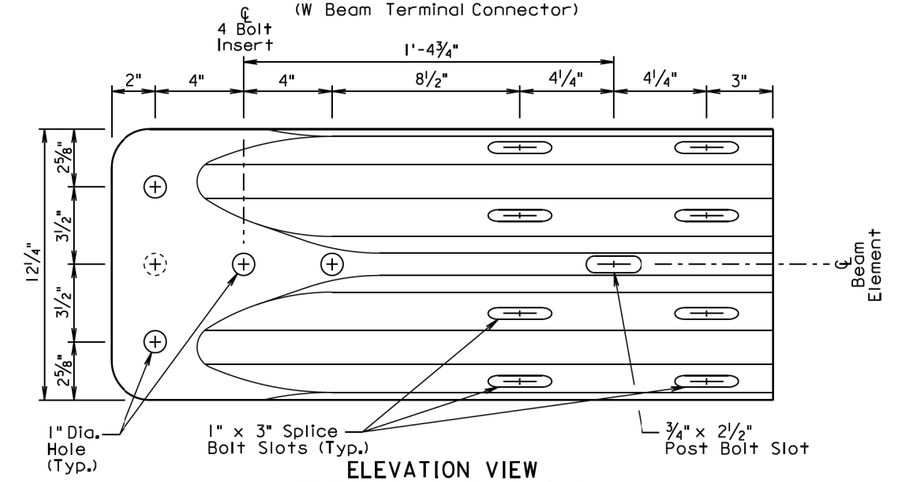
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	***TYPE 2B GUARDRAIL TRANSITION (BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO W BEAM GUARDRAIL)***	***PLATE NUMBER*** 630.55 *Sheet 2 of 2*

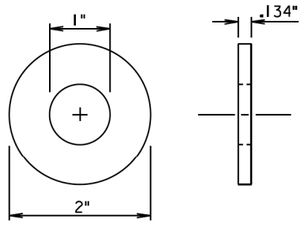


An extra hole and an approximate 26° bend shall be required only for the Special Anchor Assembly and Breakaway Cable Terminal. The Modified W Beam Terminal Connector placement detail is shown on standard plates 630.84 and 630.85.

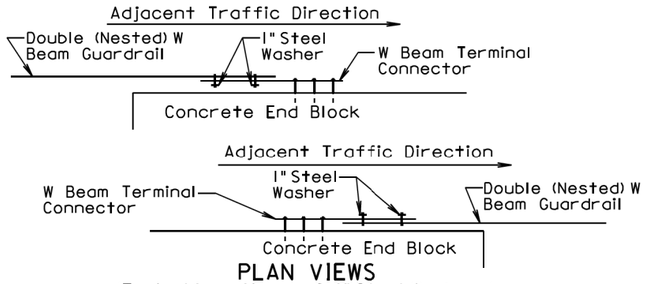
TOP VIEW
(W Beam Terminal Connector)



ELEVATION VIEW
(W Beam Terminal Connector)



1" STEEL WASHER
(8 washers required)



PLAN VIEWS
(Typical Locations of 1" Steel Washers)
(Washers are required at these lap splices)

GENERAL NOTES:

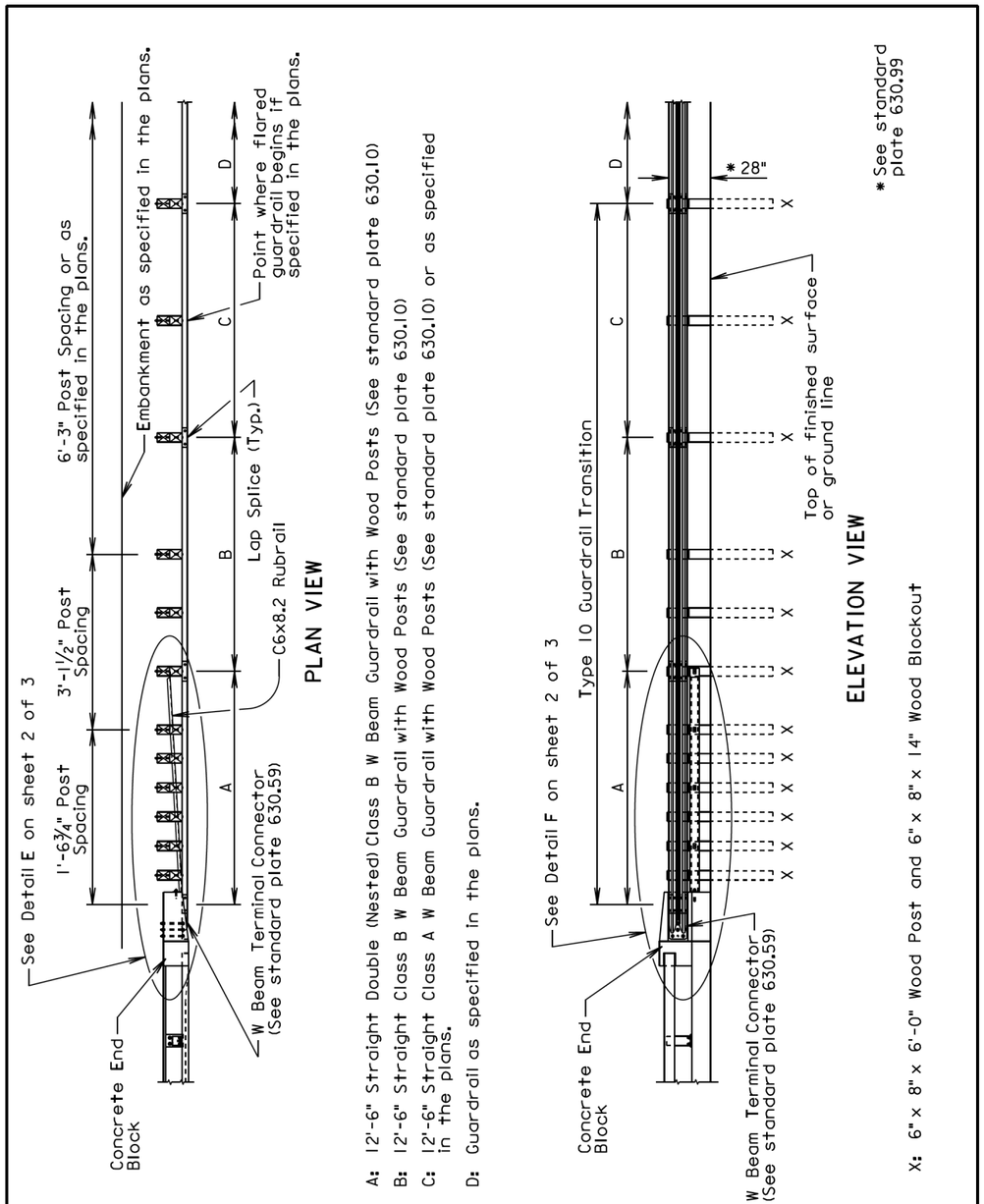
W Beam Terminal Connectors shall be 10 gauge.

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

There will be no separate payment for furnishing and installing the W beam terminal connector. All costs for furnishing and installing the W beam terminal connector shall be incidental to the contract unit price of the respective guardrail item it is attached to.

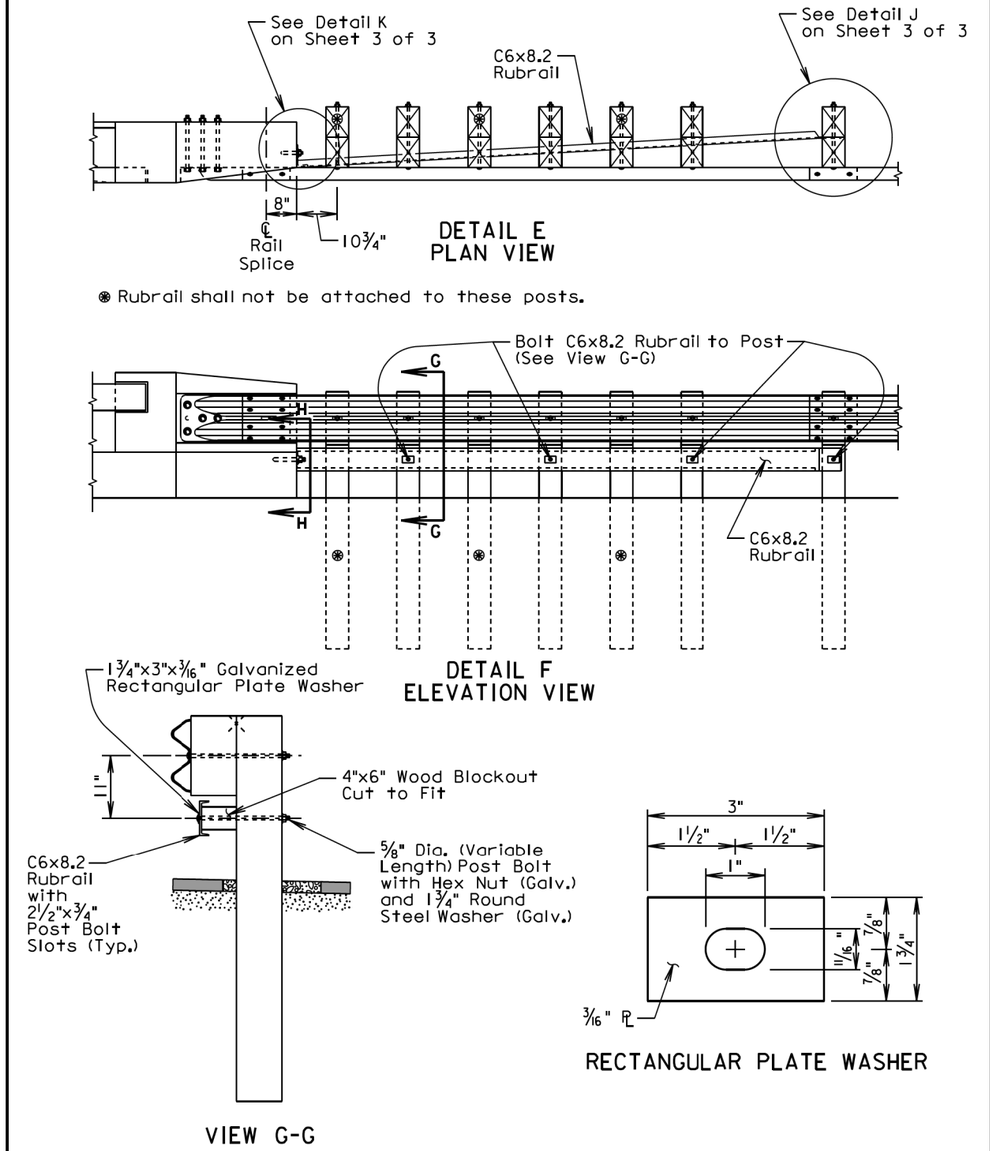
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	***W BEAM TERMINAL CONNECTOR***	***PLATE NUMBER*** 630.59 *Sheet 1 of 1*



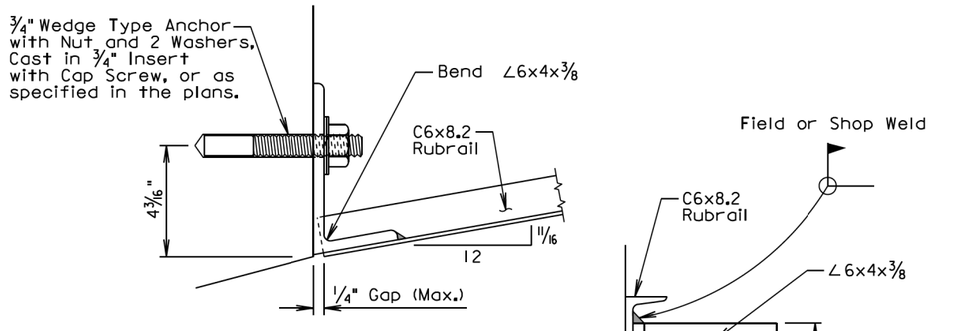
February 14, 2017

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

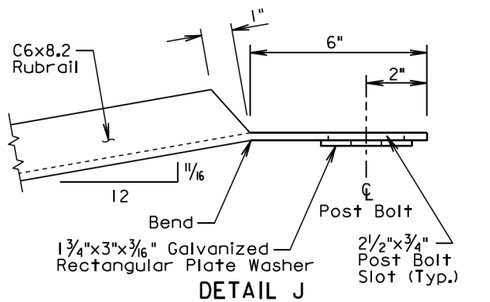


February 14, 2017

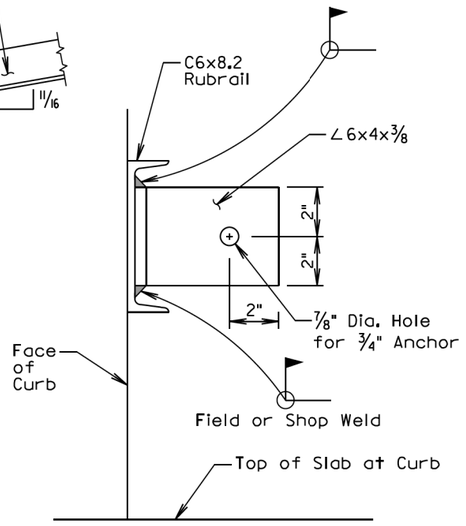
Published Date: 1st Qtr. 2018	SDDOT	TYPE 10 GUARDRAIL TRANSITION (CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.60 Sheet 2 of 3



DETAIL K
(Double Class B Rail Not Shown)



DETAIL J
(Post, Blockout, Post Bolt, and Rail Not Shown)



VIEW H-H
(Anchor and Rail Not Shown)

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.

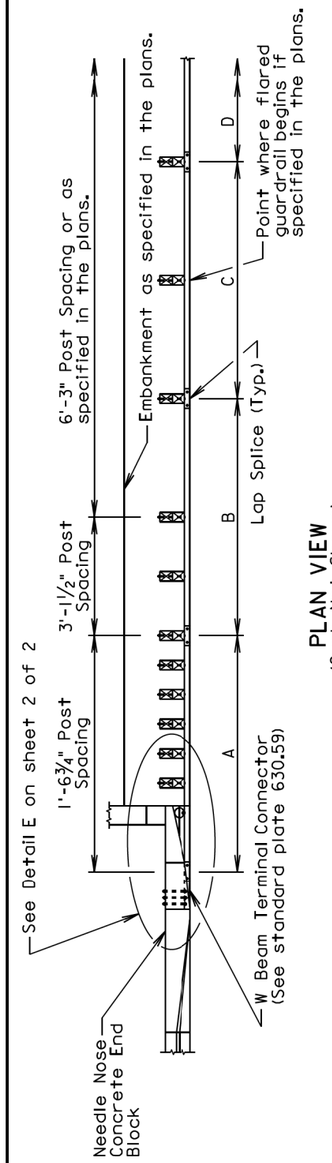
The wedge type anchor bolt, nut, and washers shall be hot dipped galvanized or made of a corrosion resistent material. The wedge type anchor shall be capable of sustaining an ultimate load in tension or shear of 17,000 pounds when the anchor is set in 4,500 psi compressive strength concrete. The anchor 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.

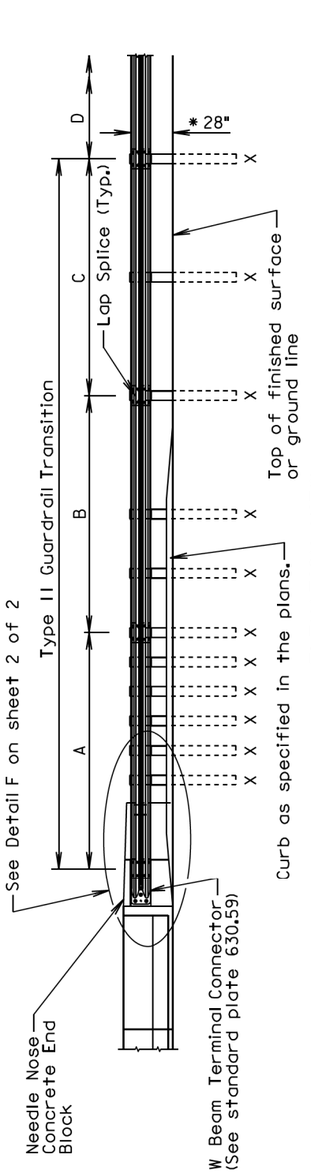
February 14, 2017

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



PLAN VIEW
(Curb Not Shown)

A: 12'-6" Straight Double (Nested) Class B W Beam Guardrail with Wood Posts (See standard plate 630.10)
B: 12'-6" Straight Class B W Beam Guardrail with Wood Posts (See standard plate 630.10)
C: 12'-6" Straight Class A W Beam Guardrail with Wood Posts (See standard plate 630.10) or as specified in the plans.
D: Guardrail as specified in the plans.

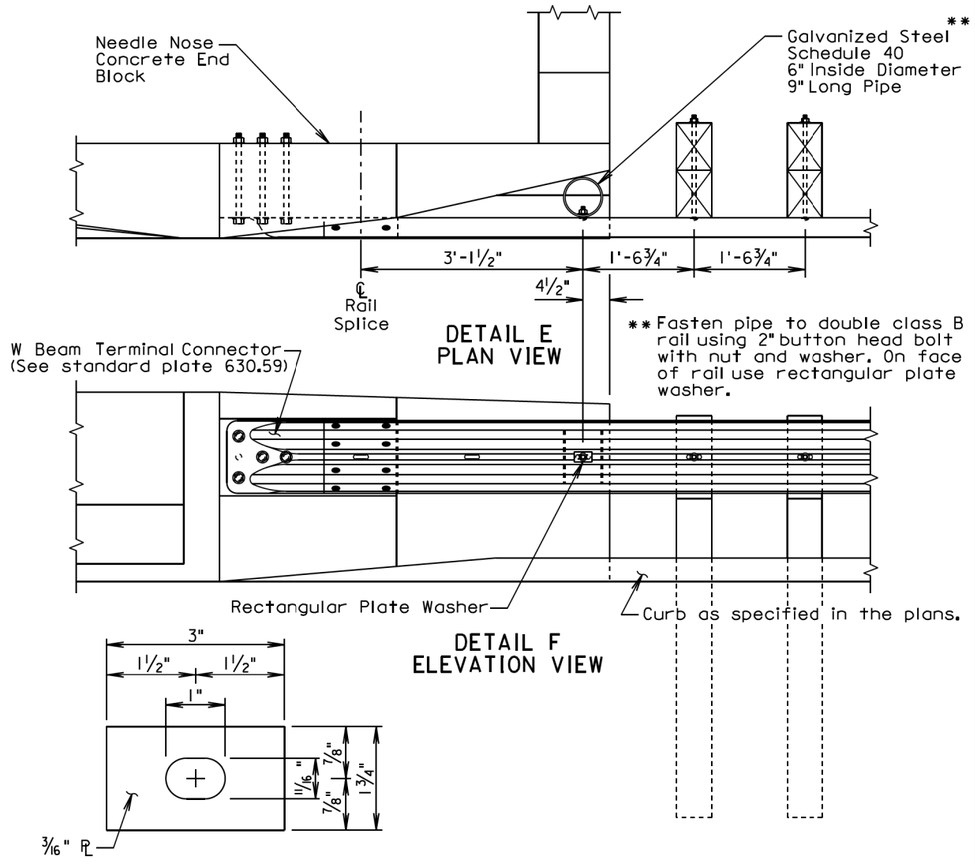


ELEVATION VIEW

X: 6" x 8" x 6'-0" Wood Post and 6" x 8" x 14" Wood Blockout

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	TYPE 11 GUARDRAIL TRANSITION (NEEDLE NOSE CONCRETE END BLOCK TO W BEAM GUARDRAIL)	PLATE NUMBER 630.61
			Sheet 1 of 2



RECTANGULAR PLATE WASHER

GENERAL NOTES:

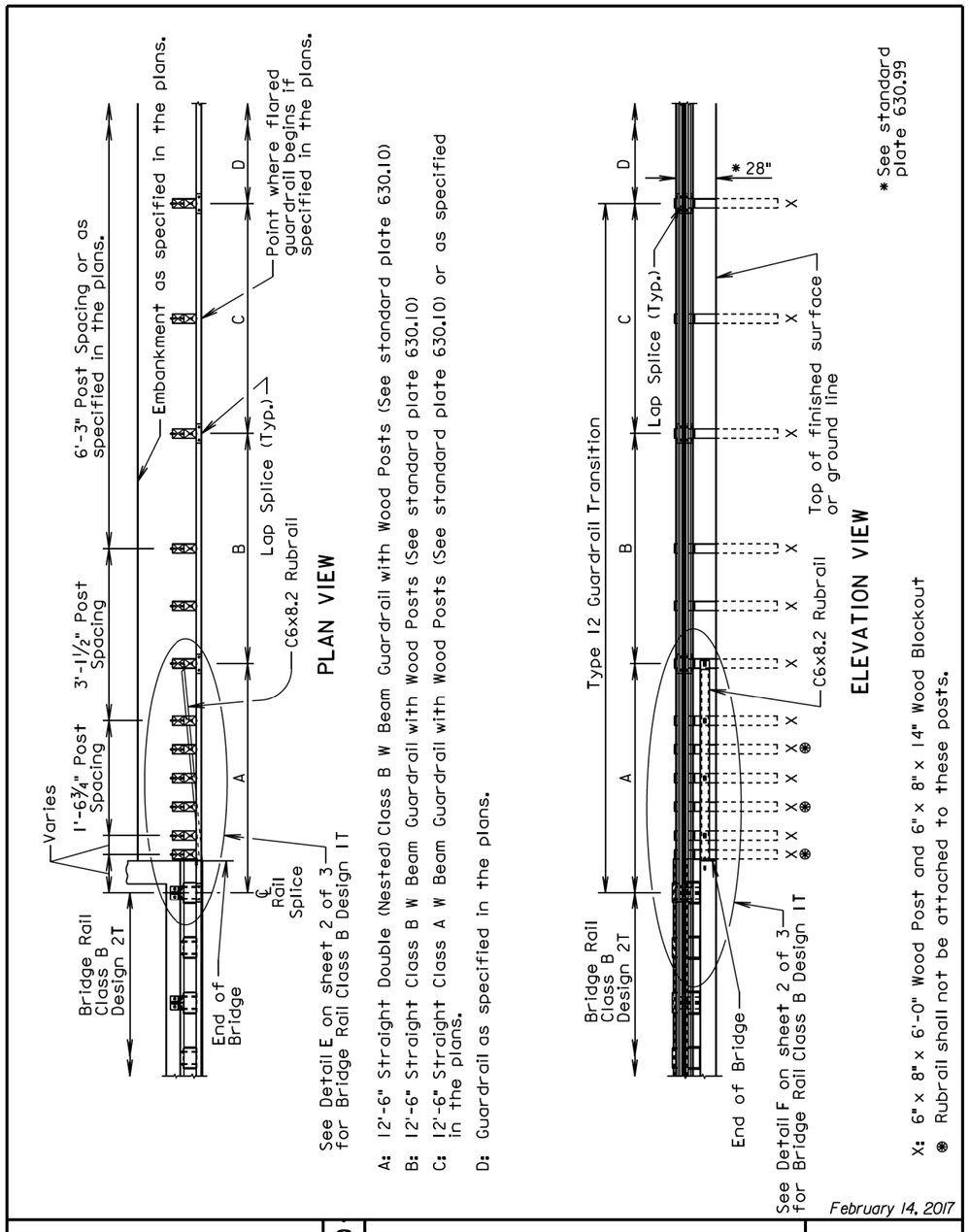
Throughout the type II guardrail transition, slots in the rails shall be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot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

All costs for furnishing and installing the straight double class B W beam guardrail including labor, equipment, and materials including the W beam rails, posts, blockouts, W beam terminal connector, steel pipe, 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 II 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: 1st Qtr. 2018	SDDOT	**TYPE 11 GUARDRAIL TRANSITION (NEEDLE NOSE CONCRETE END BLOCK TO W BEAM GUARDRAIL)**	PLATE NUMBER 630.61 Sheet 2 of 2

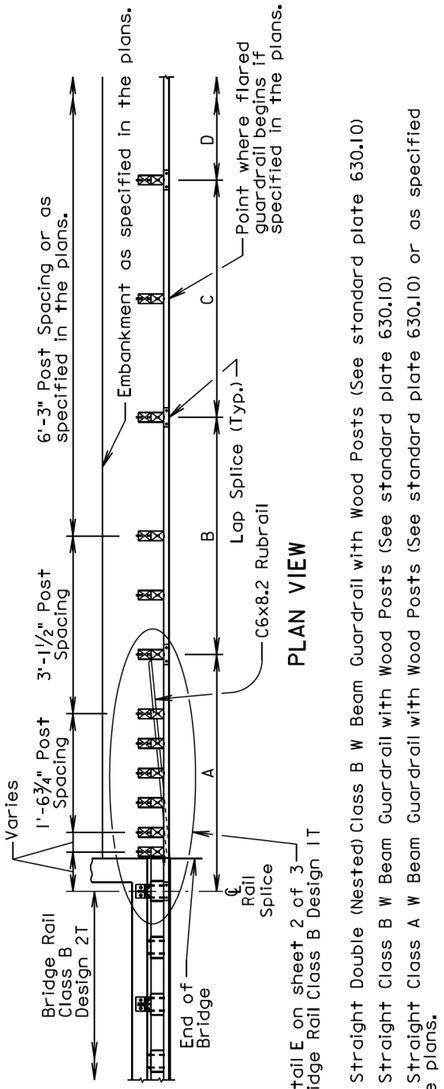


February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	**TYPE 12 GUARDRAIL TRANSITION (W BEAM BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO W BEAM GUARDRAIL)**	PLATE NUMBER 630.63 Sheet 1 of 3

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	41	57

Plotting Date: 03/05/2018



PLAN VIEW

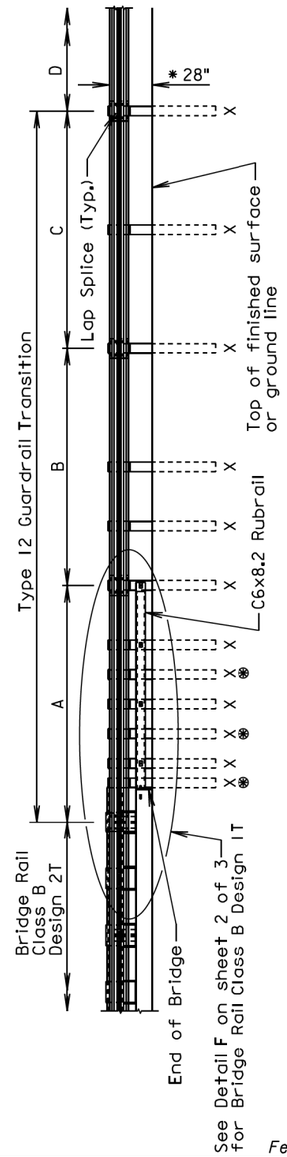
See Detail E on sheet 2 of 3 for Bridge Rail Class B Design 1T

A: 12'-6" Straight Double (Nested) Class B W Beam Guardrail with Wood Posts (See standard plate 630.10)

B: 12'-6" Straight Class B W Beam Guardrail with Wood Posts (See standard plate 630.10)

C: 12'-6" Straight Class A W Beam Guardrail with Wood Posts (See standard plate 630.10) or as specified in the plans.

D: Guardrail as specified in the plans.



ELEVATION VIEW

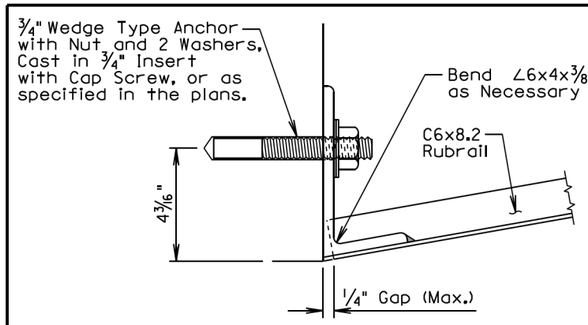
* See standard plate 630.99

X: 6"x 8"x 6'-0" Wood Post and 6"x 8"x 14" Wood Blockout

*: Rubrail shall not be attached to these posts.

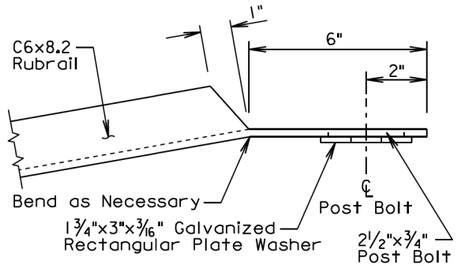
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	TYPE 12 GUARDRAIL TRANSITION (W BEAM BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO W BEAM GUARDRAIL)	PLATE NUMBER 630.63
			Sheet 1 of 3



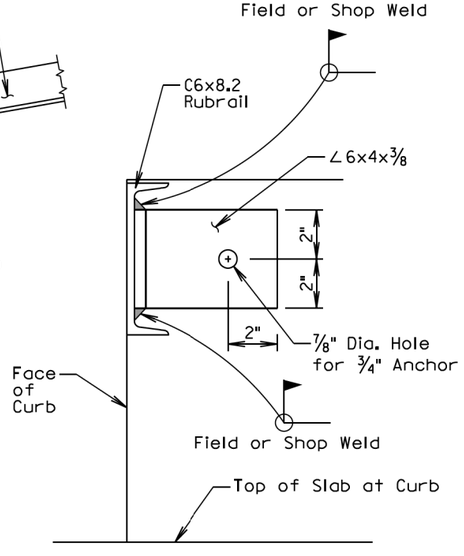
DETAIL K

(Double Class B Rail Not Shown)
(For Bridge Rail Class B Design 1T or 2T)



DETAIL J

(Post, Blockout, Post Bolt, and Rail Not Shown)
(For Bridge Rail Class B Design 1T or 2T)



VIEW H-H

(Anchor and Rail Not Shown)
(For Bridge Rail Class B Design 1T or 2T)

GENERAL NOTES:

Throughout the type 12 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 12 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: 1st Qtr. 2018	SDDOT	TYPE 12 GUARDRAIL TRANSITION (W BEAM BRIDGE RAIL CLASS B DESIGN 1T OR 2T TO W BEAM GUARDRAIL)	PLATE NUMBER 630.63
			Sheet 3 of 3

Plot Scale - 1:200

- Plotted From - tw1tn23

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Published Date: 1st Qtr. 2018

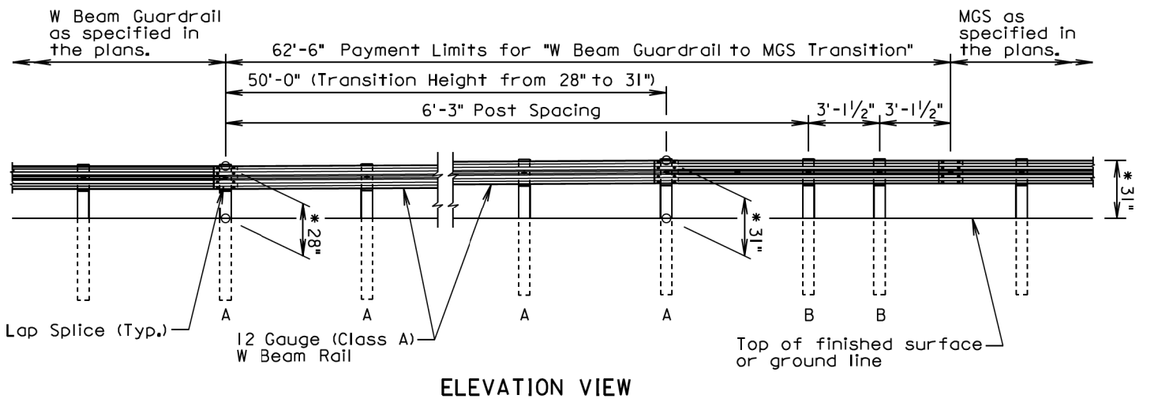
SDDOT

W BEAM GUARDRAIL TO MGS (MIDWEST GUARDRAIL SYSTEM) TRANSITION

PLATE NUMBER 630.64

Sheet 1 of 1

February 14, 2017



ELEVATION VIEW

A: 6" x 8" x 6'-0" Wood Post and 6" x 8" x 14" Wood Blockout (See standard plate 630.10)

B: 6" x 8" x 6'-0" Wood Post and 6" x 12" x 14" Wood Blockout (See standard plate 630.20)

* See standard plate 630.99

GENERAL NOTES:

All costs for furnishing and installing the W beam guardrail to MGS transition including labor, equipment, and materials which includes all rail sections, posts and blockouts, hardware, and incidentals shall be included in the contract unit price per each for "W Beam Guardrail to MGS Transition".

Published Date: 1st Qtr. 2018

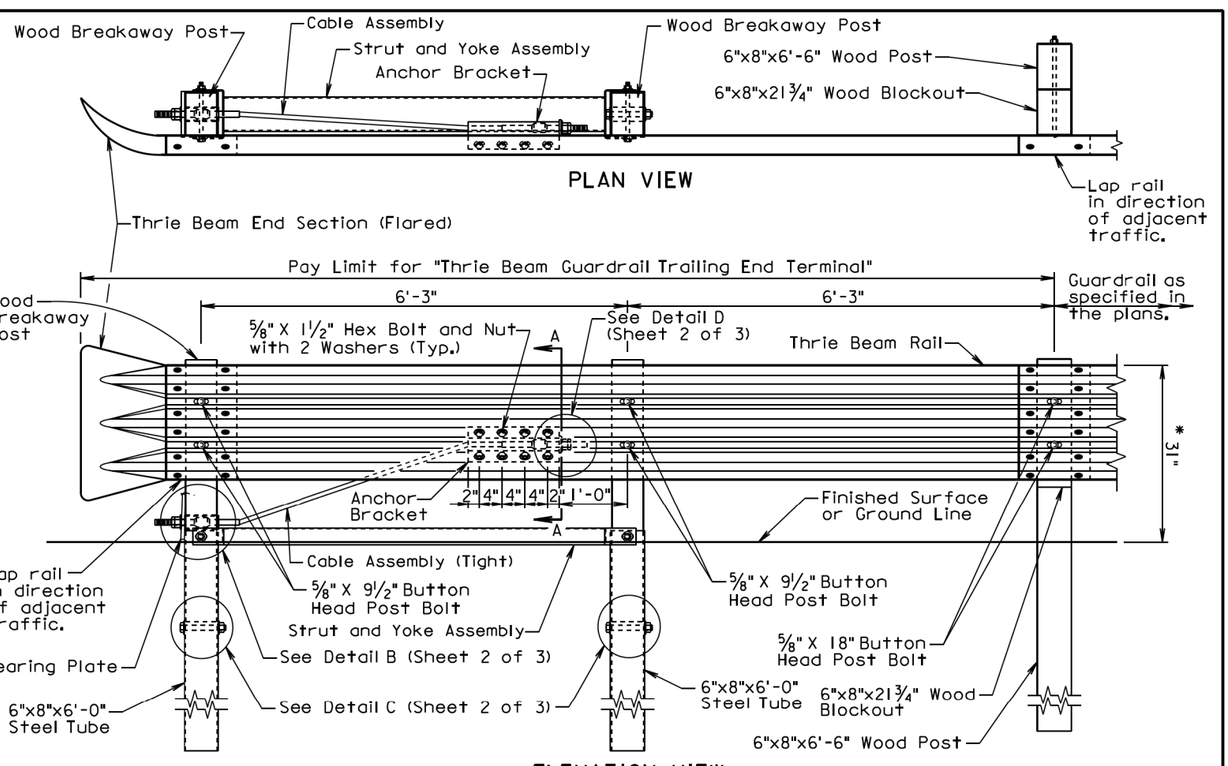
SDDOT

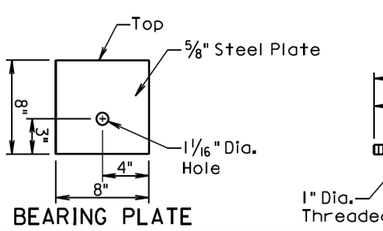
THRIE BEAM GUARDRAIL TRAILING END TERMINAL

PLATE NUMBER 630.80

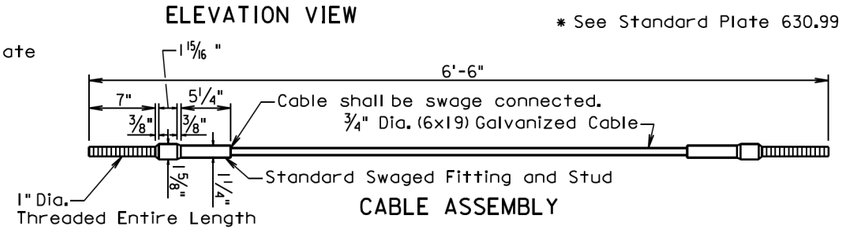
Sheet 1 of 3

June 9, 2017





BEARING PLATE



CABLE ASSEMBLY

Plotting Date: 03/05/2018

STATE OF SOUTH DAKOTA

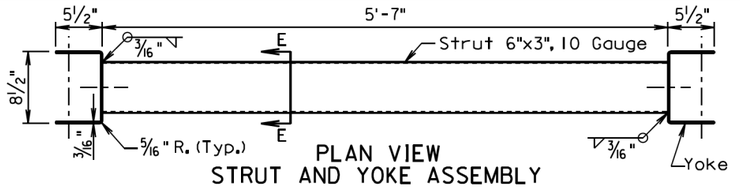
PROJECT 0001-391

SHEET 42

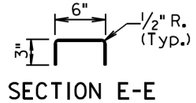
TOTAL SHEETS 57

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	43	57

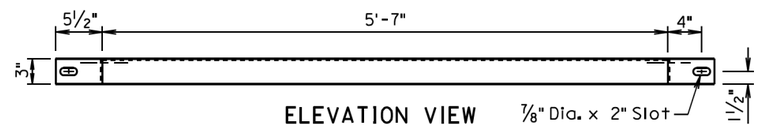
Plotting Date: 03/05/2018



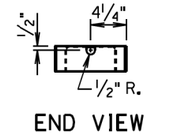
PLAN VIEW
STRUT AND YOKE ASSEMBLY



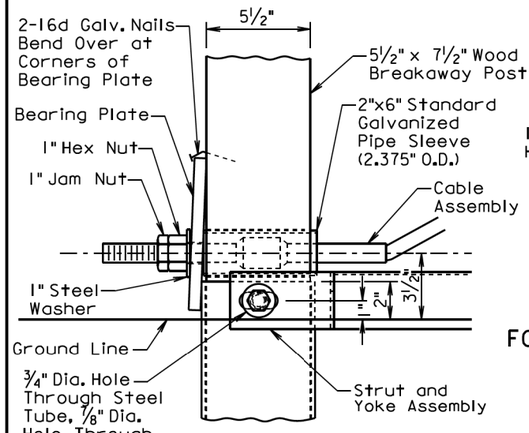
SECTION E-E
STRUT



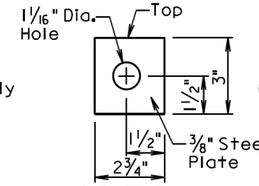
ELEVATION VIEW
STRUT AND YOKE ASSEMBLY



END VIEW
STRUT AND
YOKE ASSEMBLY



DETAIL B



END PLATE
FOR ANCHOR BRACKET

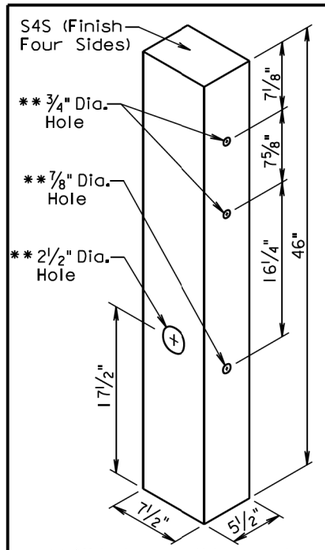
DETAIL C

DETAIL D
(Thrie Beam Rail Not Shown)

SECTION A-A

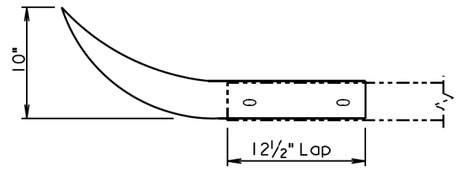
June 9, 2017

Published Date: 1st Qtr. 2018	SDDOT	THRIE BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 2 of 3

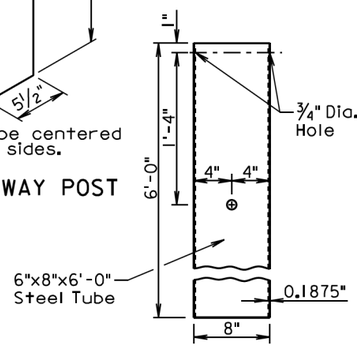


** All holes shall be centered on respective sides.

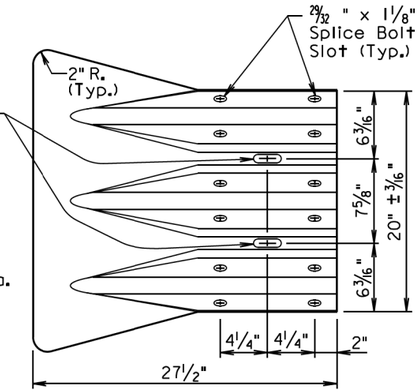
WOOD BREAKAWAY POST



TOP VIEW
(Thrie Beam End Section (Flared))



STEEL TUBE



ELEVATION VIEW
(Thrie Beam End Section (Flared))

GENERAL NOTES:

The thrie beam guardrail trailing end terminal shall only be used in a one-way traffic situation.

Thrie beam end sections (flared) shall be 12 gauge.

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

The steel tube 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.

All hardware shall be galvanized in accordance with ASTM A153.

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.

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 constructing the thrie beam guardrail trailing end terminal including labor, equipment, materials which includes thrie beam rail section, post and blockout, wood breakaway posts, steel tubes, cable assembly, bearing plate, anchor bracket, strut and yoke assembly, thrie beam end section (flared), hardware, and incidentals shall be included in the contract unit price per each for "Thrie Beam Guardrail Trailing End Terminal".

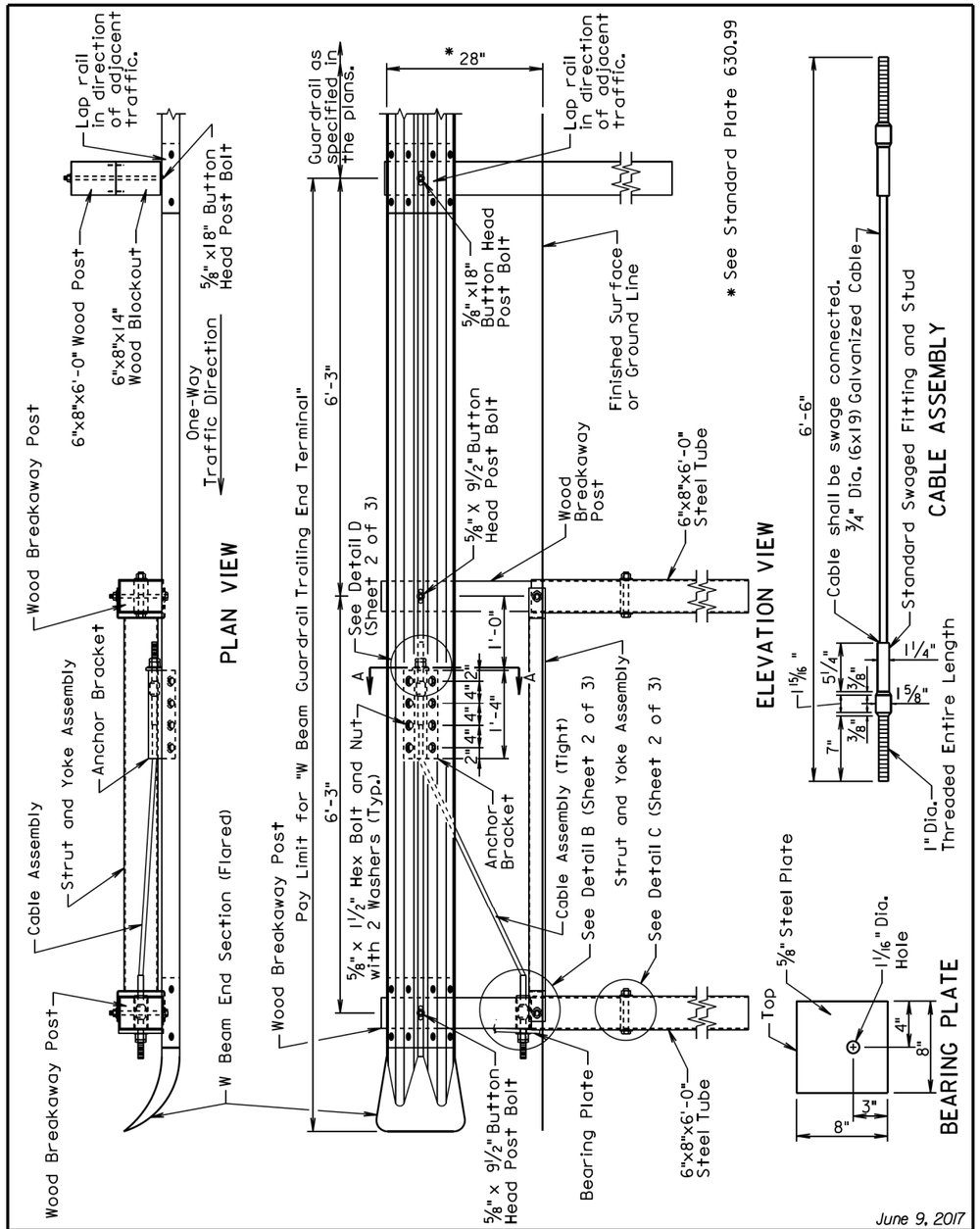
June 9, 2017

Published Date: 1st Qtr. 2018	SDDOT	THRIE BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 3 of 3

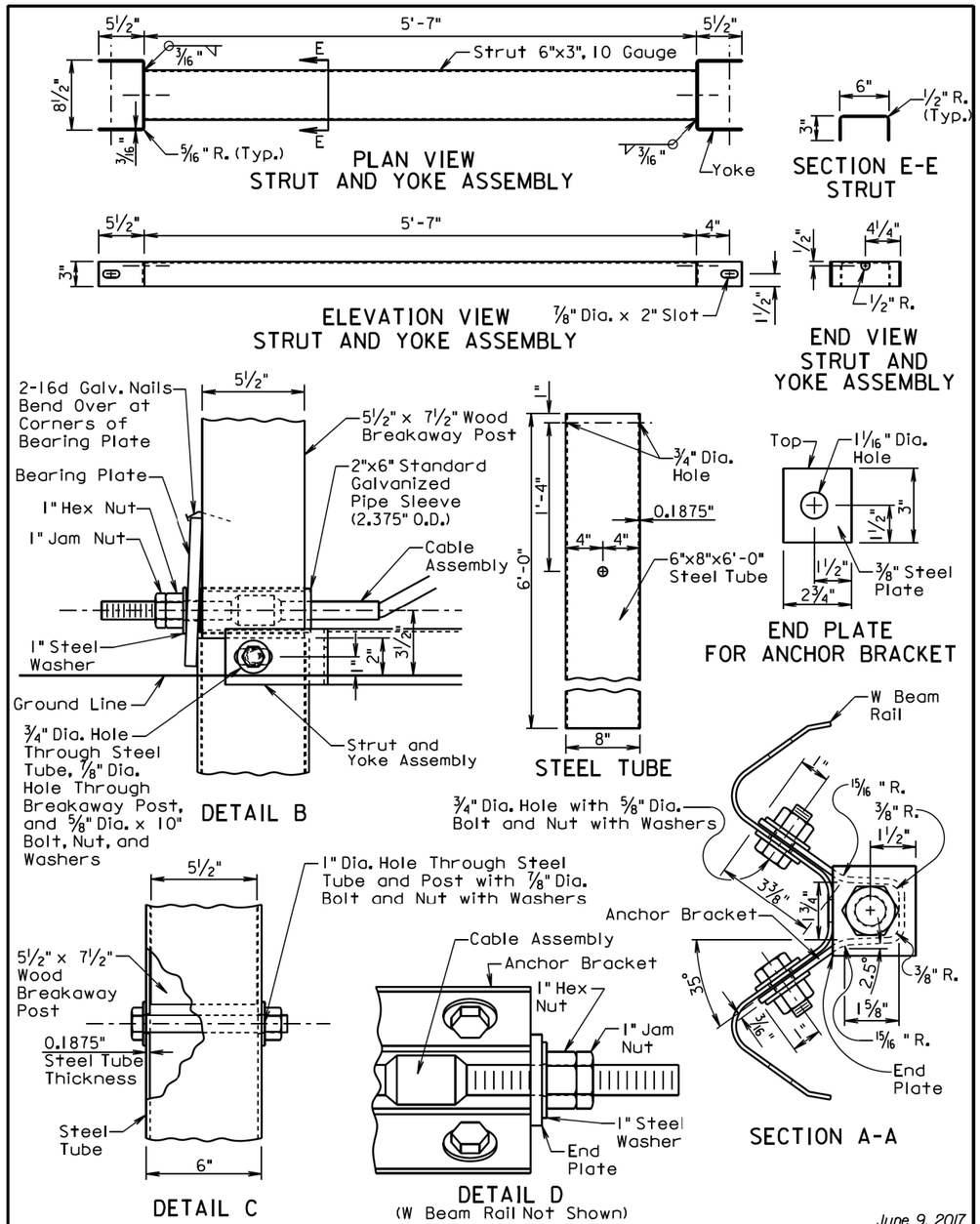
- Plotted From - trwi1n23
Plot Scale - 1:200
File - ...\Working\Standard Plates.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	44	57

Plotting Date: 03/05/2018

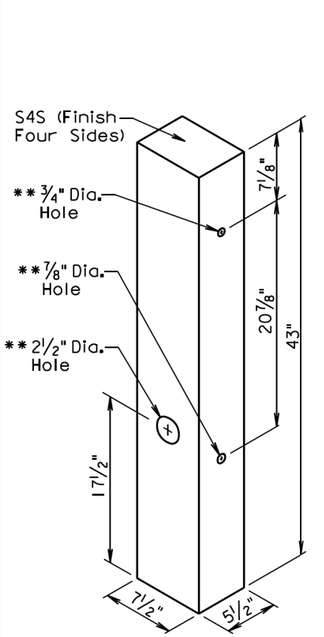


Published Date: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.81 Sheet 1 of 3



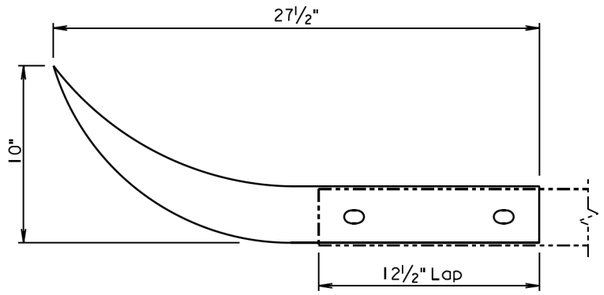
Published Date: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.81 Sheet 2 of 3

- Plotted From - tnvi1nf23
Plot Scale - 1:200
File - ...\Working\Standard Plates.dgn

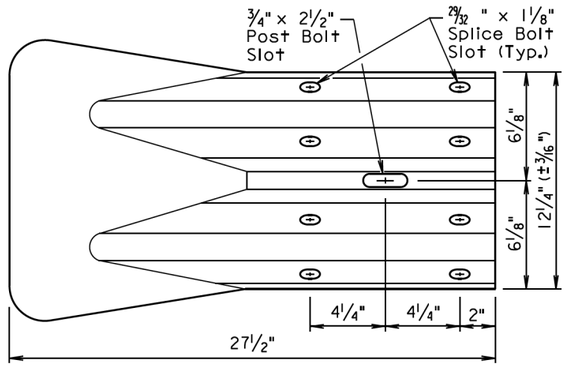


**All holes shall be centered on respective sides.

WOOD BREAKAWAY POST



PLAN VIEW
(W Beam End Section (Flared))



ELEVATION VIEW
(W Beam End Section (Flared))

GENERAL NOTES:

The W beam guardrail trailing end terminal shall only be used in a one-way traffic situation.

W beam end section (flared) shall be 12 gauge.

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

The steel tube 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.

All hardware shall be galvanized in accordance with ASTM A153.

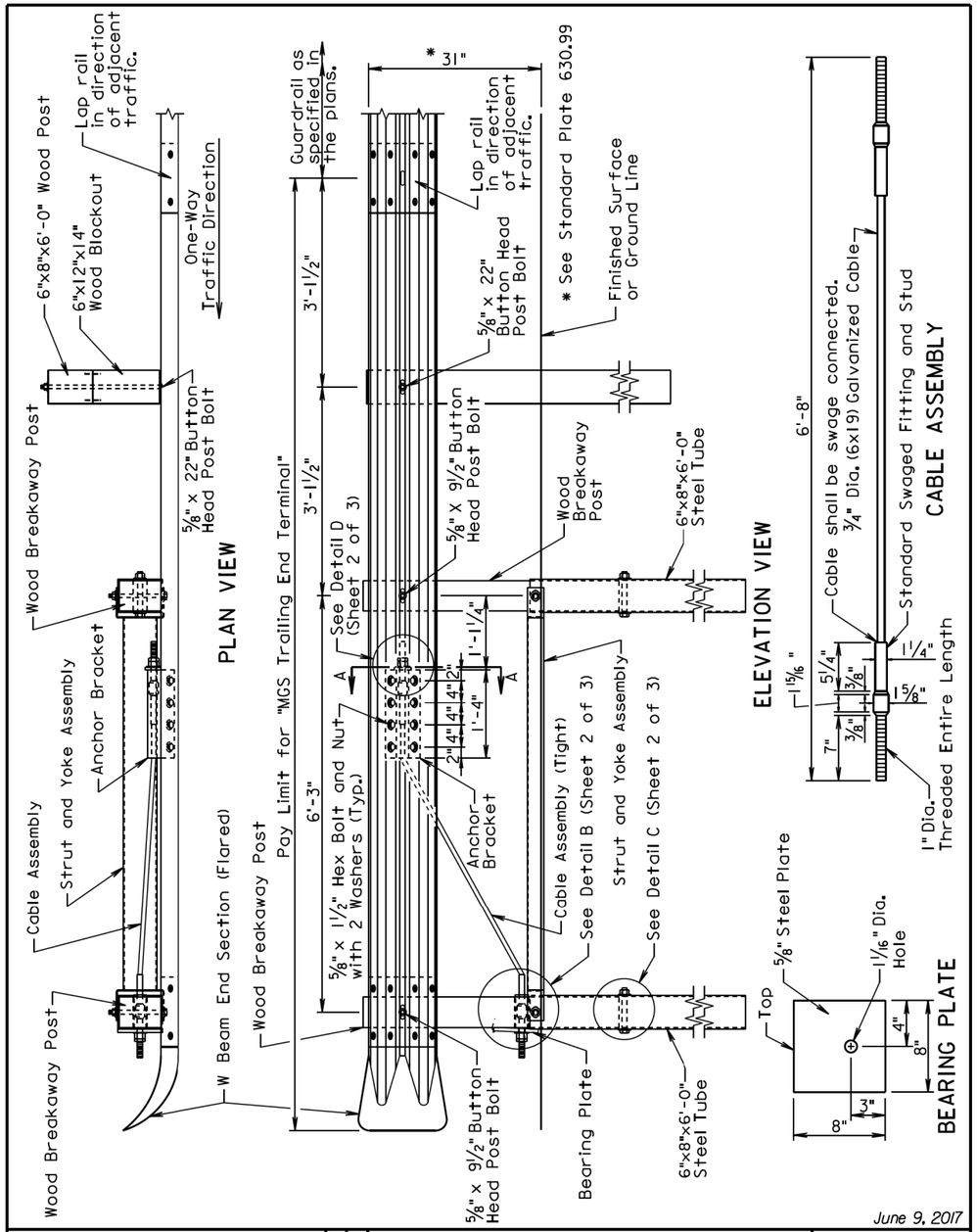
The anchor bracket, strut and yoke assembly, and bearing plate shall be fabricated from steel that meets ASTM A36 Specifications. They shall be galvanized after fabrication in accordance with ASTM A123.

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 constructing the W beam guardrail trailing end terminal including labor, equipment, materials which includes W beam rail section, two wood breakaway posts, steel tubes, strut and yoke assembly, cable assembly, bearing plate, anchor bracket, W beam end section (flared), one wood post and blockout, hardware, and incidentals shall be included in the contract unit price per each for "W Beam Guardrail Trailing End Terminal".

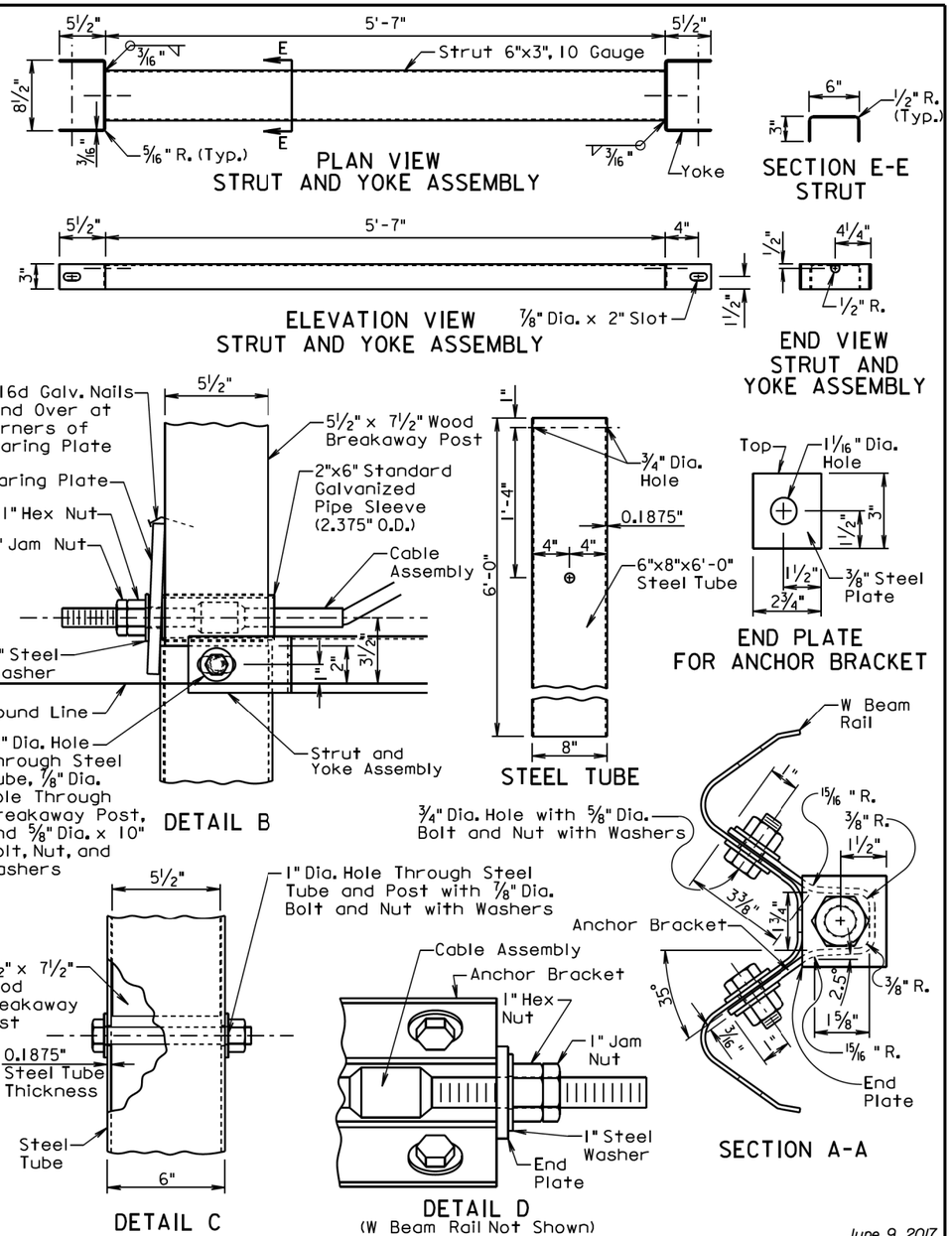
June 9, 2017

Published Date: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.81
			Sheet 3 of 3



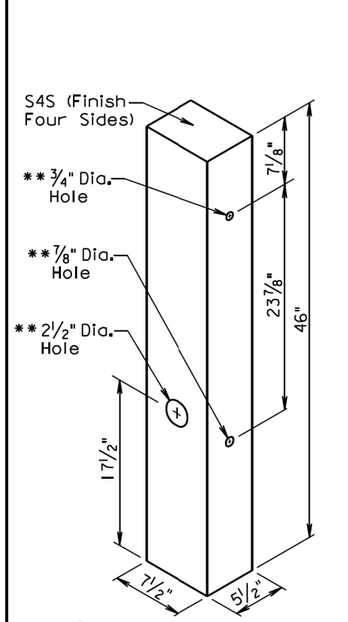
June 9, 2017

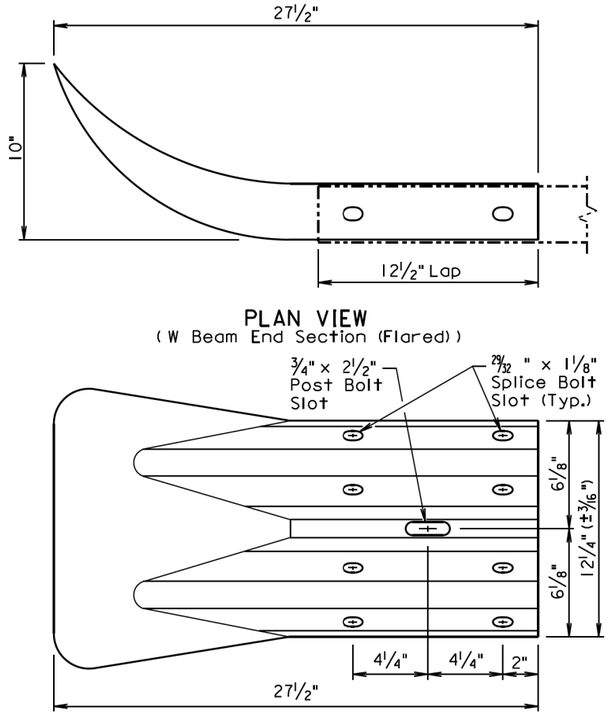
Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS) TRAILING END TERMINAL	PLATE NUMBER 630.82
			Sheet 1 of 3



June 9, 2017

Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS) TRAILING END TERMINAL	PLATE NUMBER 630.82
			Sheet 2 of 3





GENERAL NOTES:

The MGS trailing end terminal shall only be used in a one-way traffic situation.

W beam end section (flared) shall be 12 gauge.

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

The steel tube 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.

All hardware shall be galvanized in accordance with ASTM A153.

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

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 constructing the MGS trailing end terminal including labor, equipment, materials which includes W beam rail section, two wood breakaway posts, steel tubes, strut and yoke assembly, cable assembly, bearing plate, anchor bracket, W beam end section (flared), one MGS wood post and blockout, hardware, and incidentals shall be included in the contract unit price per each for "MGS Trailing End Terminal".

June 9, 2017

Published Date: 1st Qtr. 2018	SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS) TRAILING END TERMINAL	PLATE NUMBER 630.82
			Sheet 3 of 3

Published Date: 1st Qtr. 2018

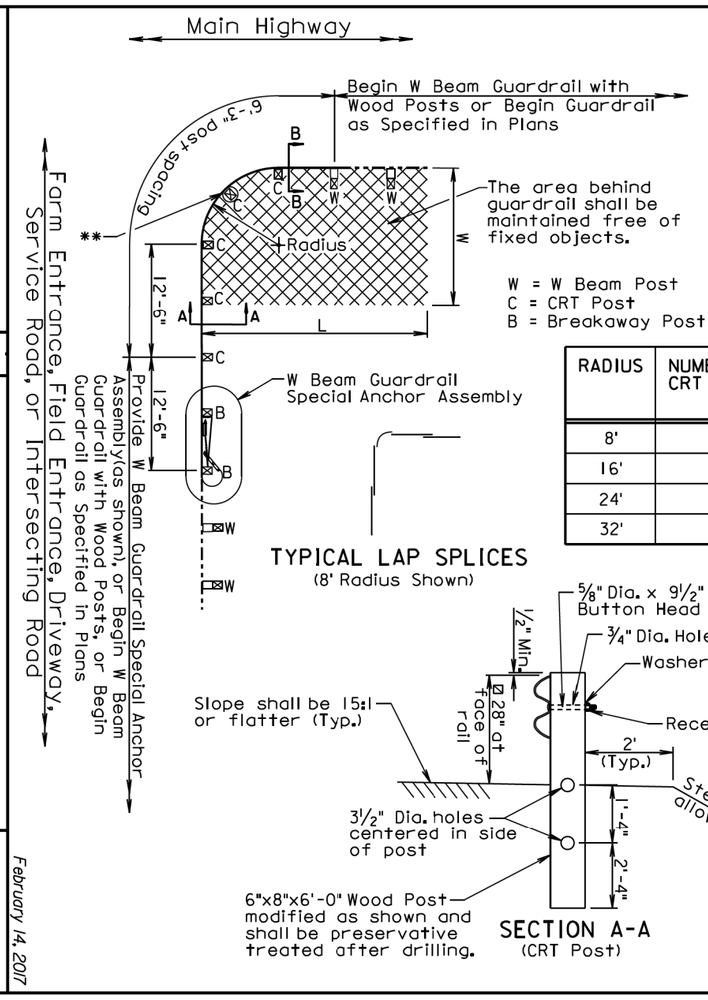
SDDOT

SHORT RADIUS W BEAM GUARDRAIL AND SPECIAL ANCHOR ASSEMBLY

PLATE NUMBER 630.84

Sheet 1 of 4

February 14, 2017



GENERAL NOTES:

**The rail shall NOT be bolted to the CRT post at the center of the 8' radius nose only.

Washers shall not be used on the face of the rail under the ⅝" button head bolts connecting the rail to the Controlled Releasing Terminal (CRT) posts.

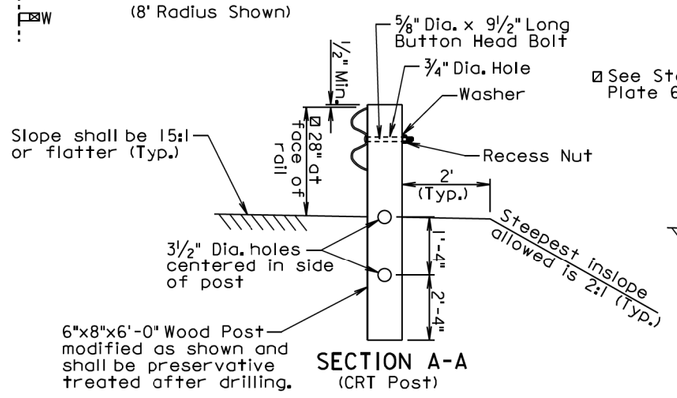
The curved guardrail sections shall be shop bent.

The W Beam Guardrail Special Anchor has not been tested as a crashworthy end treatment for approaching traffic on the intersecting roadway. Therefore, its use shall be limited to farm and field entrances, driveways, or service roads.

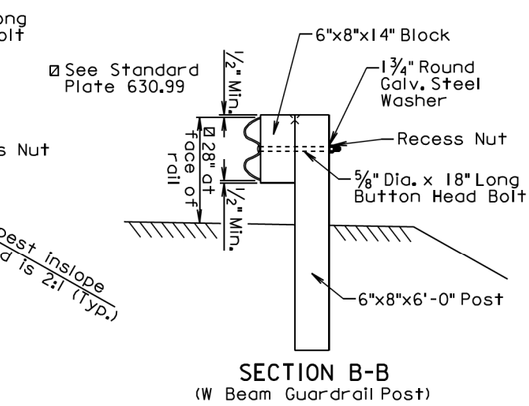
RADIUS	NUMBER OF CRT POSTS	*NUMBER AND LENGTH OF CURVED RAILS	REQUIRED AREA FREE OF FIXED OBJECTS (L x W)
8'	5	1 @ 12.5'	25' x 15'
16'	7	1 @ 25'	30' x 15'
24'	9	1 @ 25' and 1 @ 12.5'	40' x 20'
32'	11	2 @ 25'	50' x 20'

*The number of rails is based on a 90° intersection.

TYPICAL LAP SPLICES
(8' Radius Shown)



SECTION A-A
(CRT Post)



SECTION B-B
(W Beam Guardrail Post)

Published Date: 1st Qtr. 2018

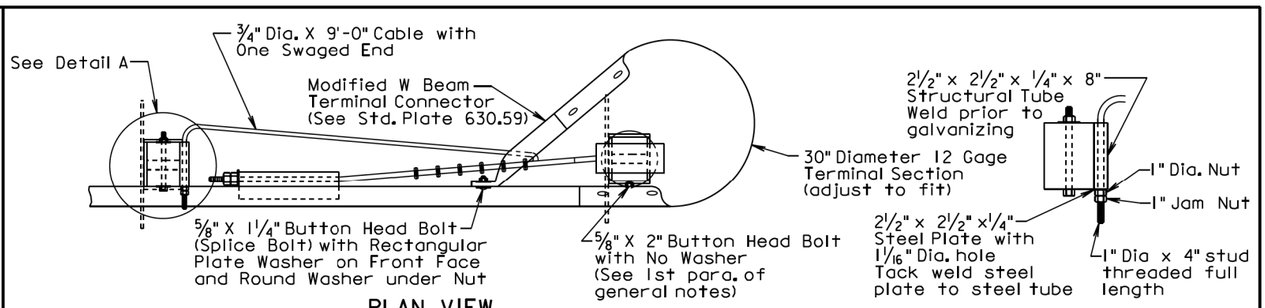
SDDOT

SHORT RADIUS W BEAM GUARDRAIL AND SPECIAL ANCHOR ASSEMBLY

PLATE NUMBER 630.84

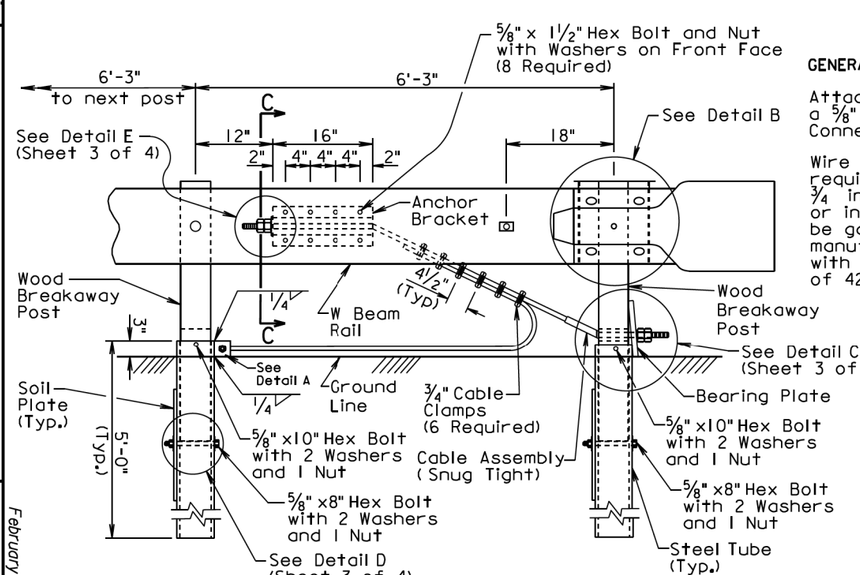
Sheet 2 of 4

February 14, 2017



PLAN VIEW
W BEAM GUARDRAIL SPECIAL ANCHOR ASSEMBLY

DETAIL A

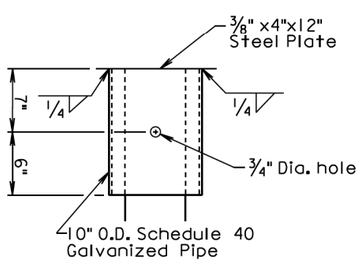


ELEVATION VIEW
W BEAM GUARDRAIL SPECIAL ANCHOR ASSEMBLY

GENERAL NOTES:

Attach W beam rail to the steel pipe with a ⅝" x2" button head bolt with no washer. Connection to the post is NOT required.

Wire rope shall conform to the requirements of AASHTO M 30, shall be ¾ inch (6x19) preformed wire strand core or independent wire rope core, and shall be galvanized. The wire rope shall be manufactured of improved plow steel with a minimum breaking strength of 42,800 pounds.



DETAIL B
(Guardrail and Terminal Section not shown)

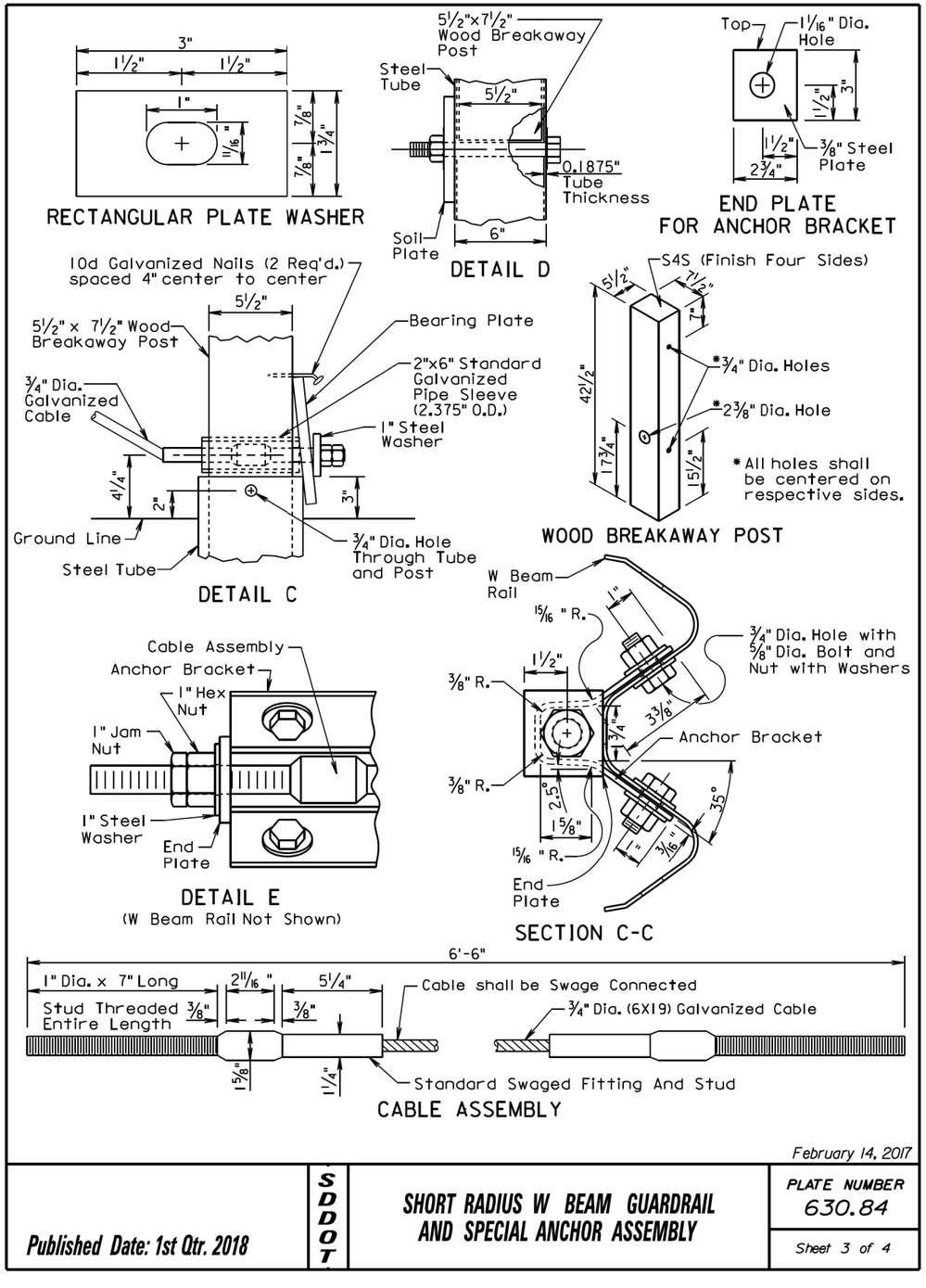
Plotting Date: 03/05/2018

STATE OF SOUTH DAKOTA

PROJECT 0001-391

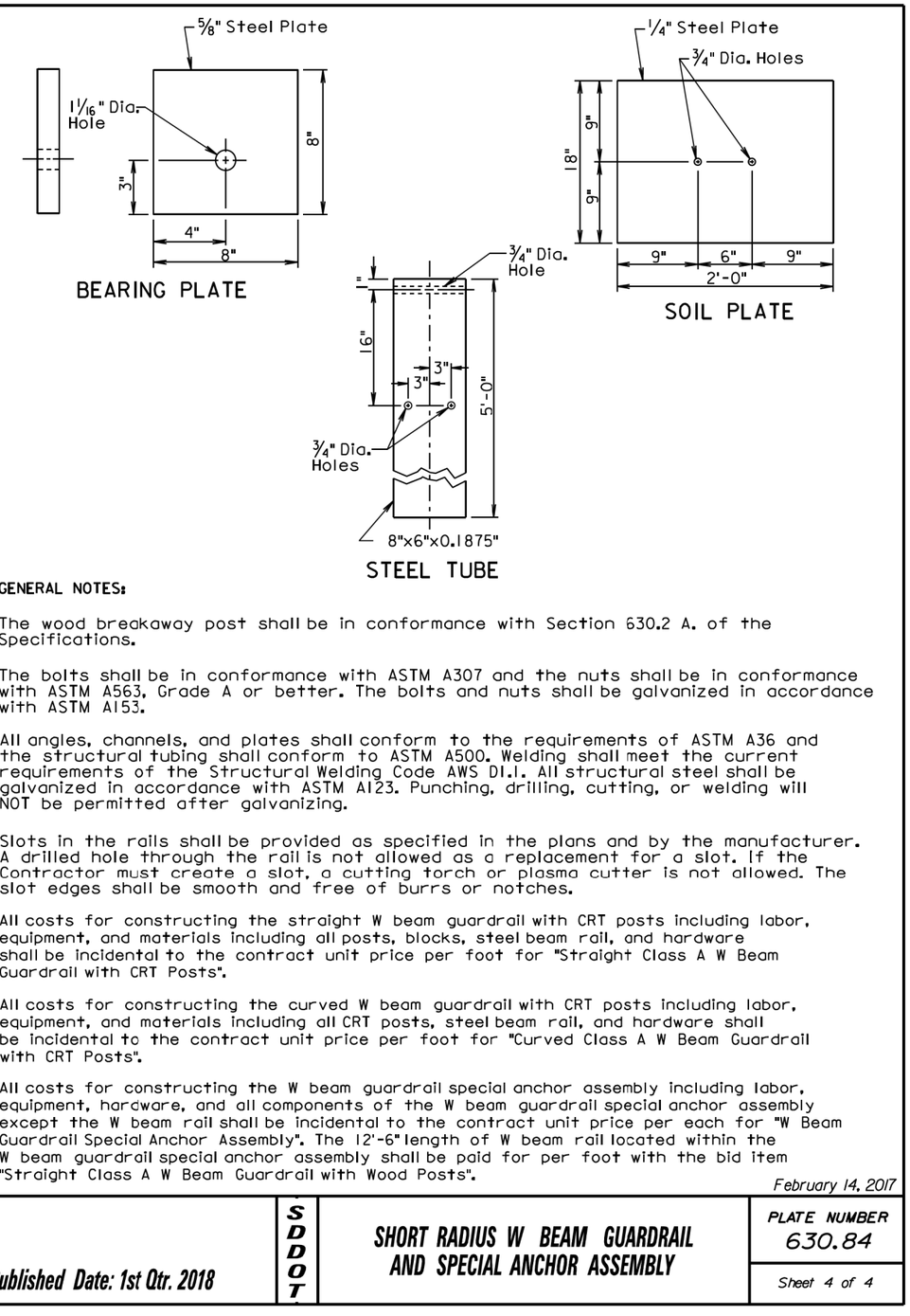
SHEET 47

TOTAL SHEETS 57



February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	SHORT RADIUS W BEAM GUARDRAIL AND SPECIAL ANCHOR ASSEMBLY	PLATE NUMBER 630.84 Sheet 3 of 4



GENERAL NOTES:

The wood breakaway post shall be in conformance with Section 630.2 A. of the Specifications.

The bolts shall be in conformance with ASTM A307 and the nuts shall be in conformance with ASTM A563, Grade A or better. The bolts and nuts shall be galvanized in accordance with ASTM A153.

All angles, channels, and plates shall conform to the requirements of ASTM A36 and the structural tubing shall conform to ASTM A500. Welding shall meet the current requirements of the Structural Welding Code AWS D1.1. All structural steel shall be galvanized in accordance with ASTM A123. Punching, drilling, cutting, or welding will NOT be permitted after galvanizing.

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.

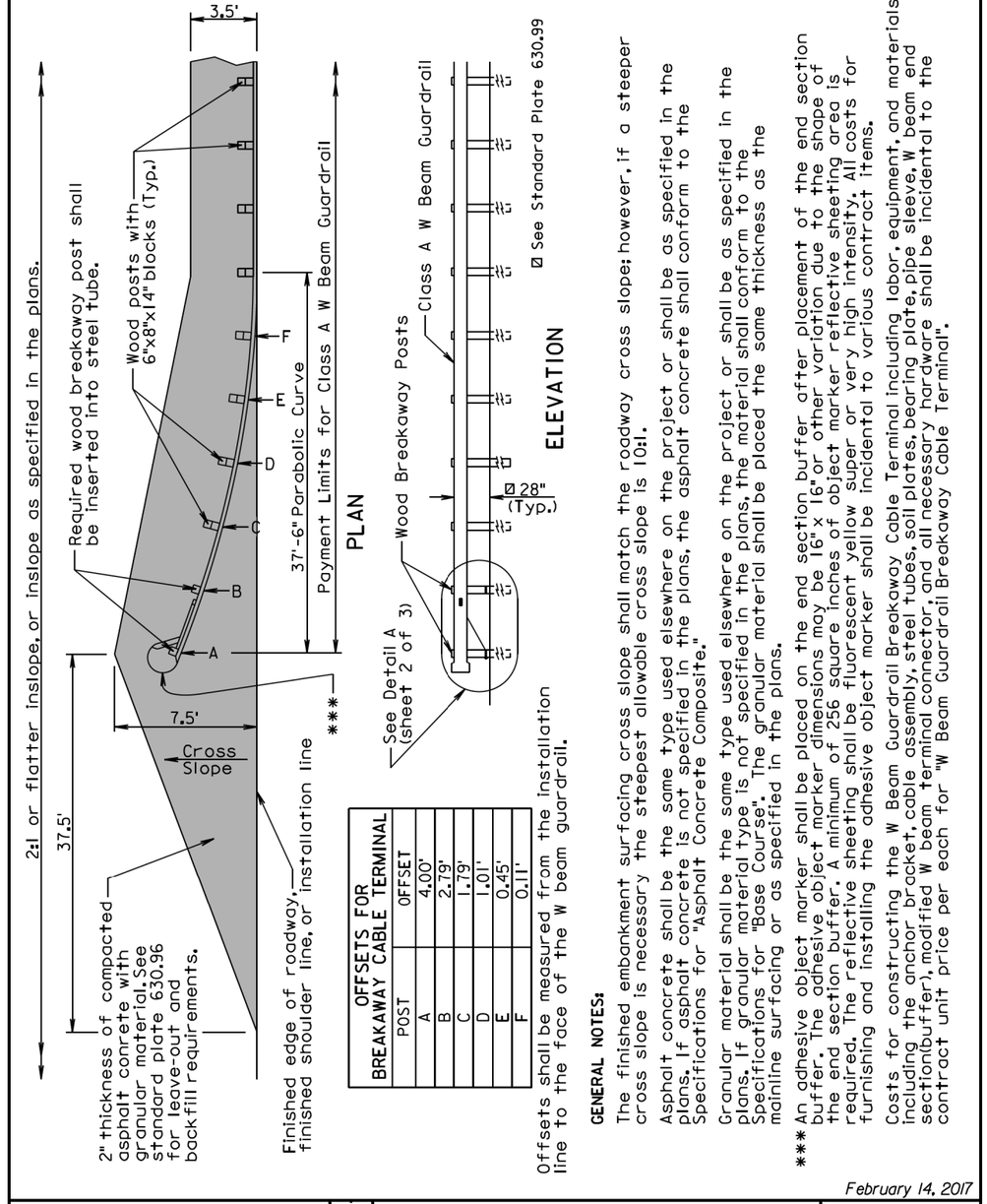
All costs for constructing the straight W beam guardrail with CRT posts including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for "Straight Class A W Beam Guardrail with CRT Posts".

All costs for constructing the curved W beam guardrail with CRT posts including labor, equipment, and materials including all CRT posts, steel beam rail, and hardware shall be incidental to the contract unit price per foot for "Curved Class A W Beam Guardrail with CRT Posts".

All costs for constructing the W beam guardrail special anchor assembly including labor, equipment, hardware, and all components of the W beam guardrail special anchor assembly except the W beam rail shall be incidental to the contract unit price per each for "W Beam Guardrail Special Anchor Assembly". The 12'-6" length of W beam rail located within the W beam guardrail special anchor assembly shall be paid for per foot with the bid item "Straight Class A W Beam Guardrail with Wood Posts".

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	SHORT RADIUS W BEAM GUARDRAIL AND SPECIAL ANCHOR ASSEMBLY	PLATE NUMBER 630.84 Sheet 4 of 4



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 Specifications for "Asphalt Concrete Composite."

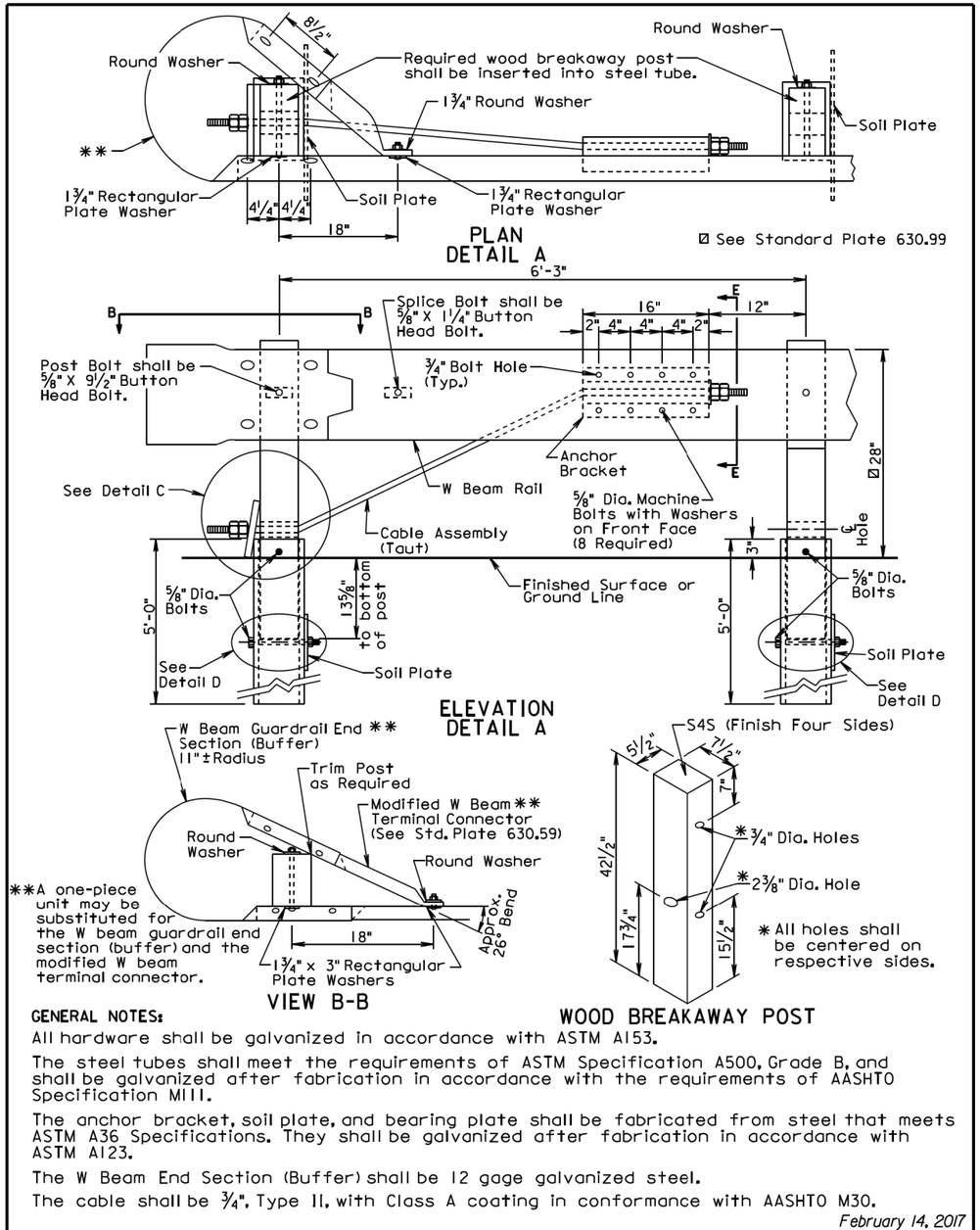
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline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

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

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

February 14, 2017

Published Date: 1st 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.

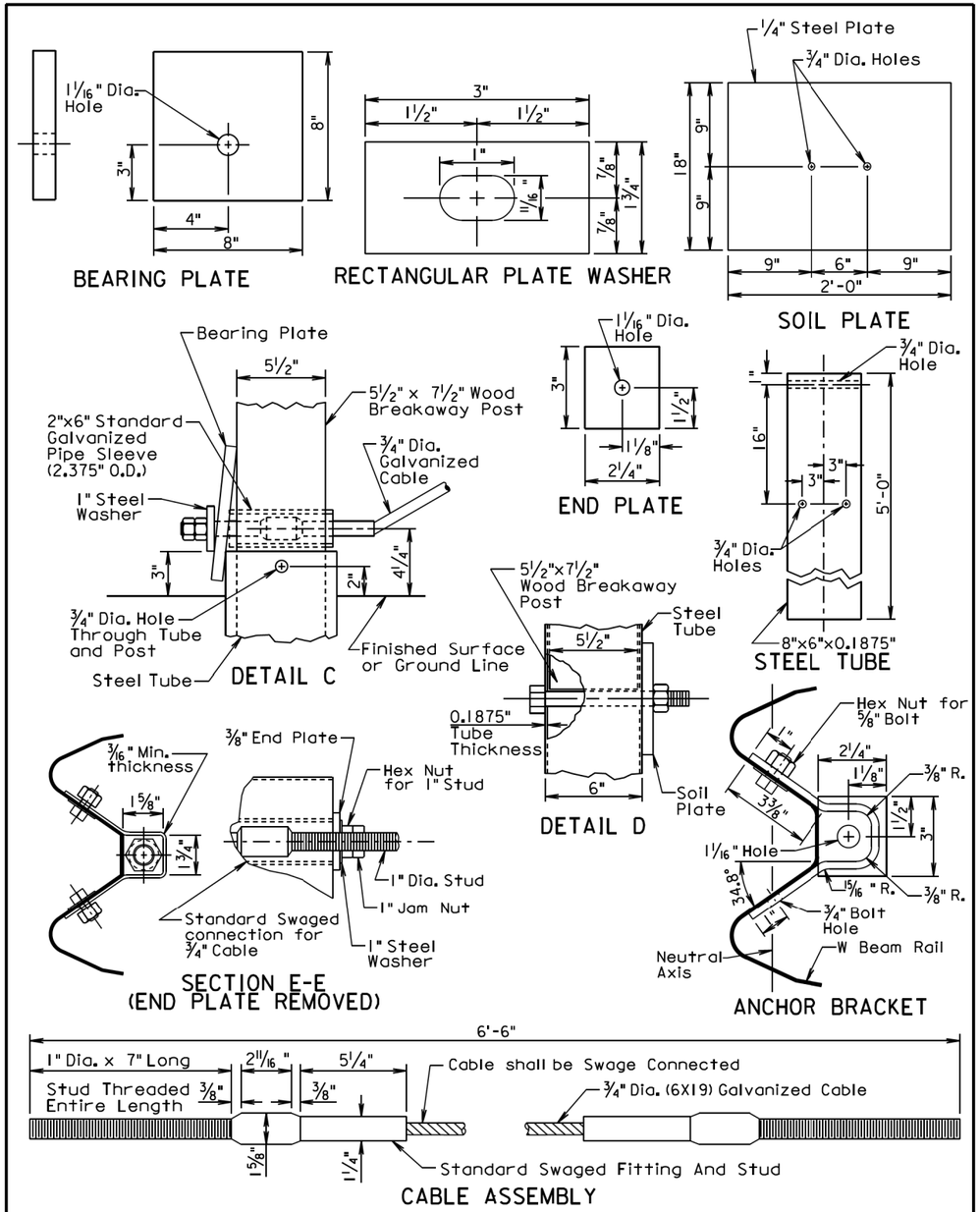
The cable shall be 3/4", Type II, with Class A coating in conformance with AASHTO M30.

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.85
			Sheet 2 of 3

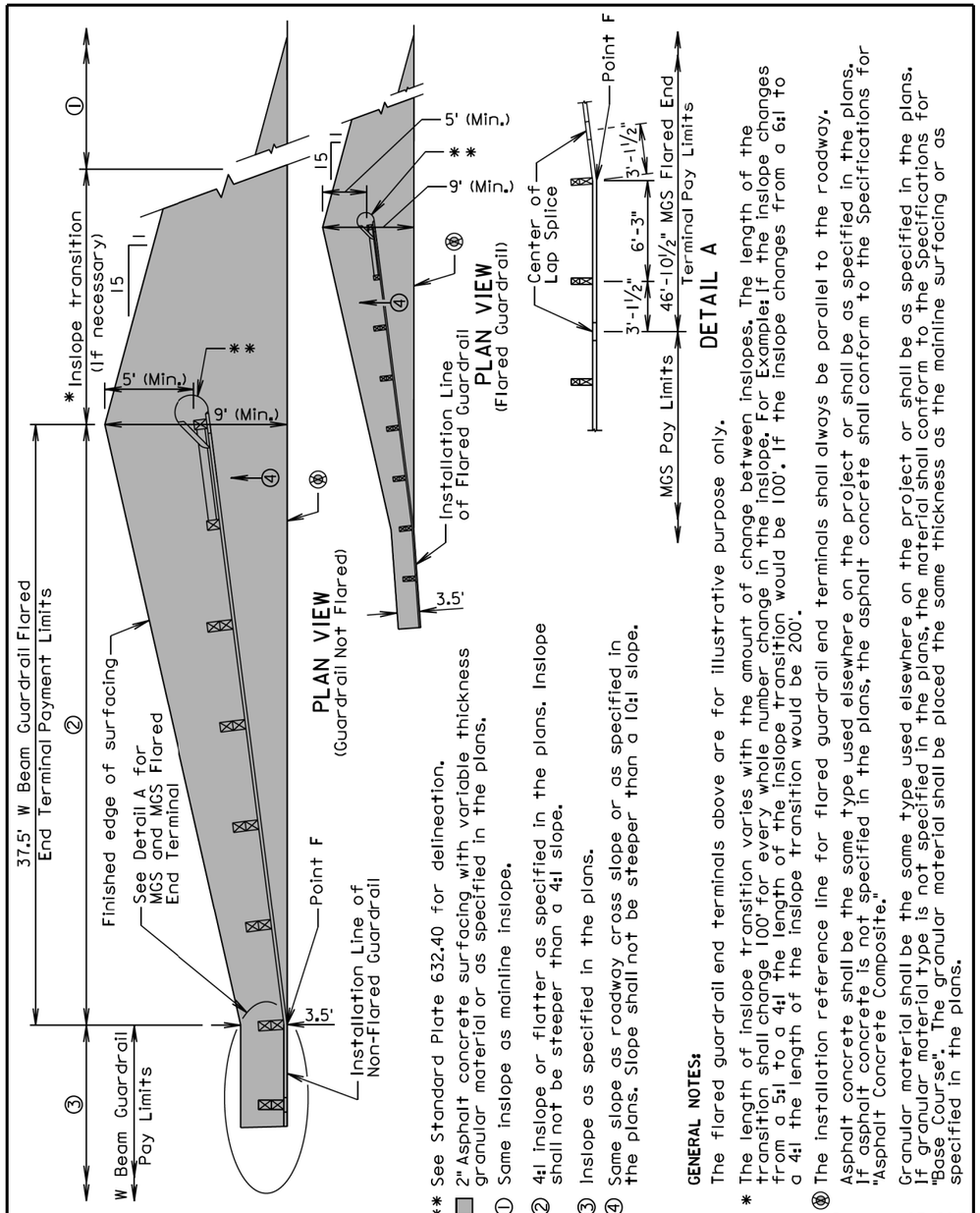
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	50	57

Plotting Date: 03/05/2018



February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.85 Sheet 3 of 3



* 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'.

⑧ 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 material 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

Published Date: 1st Qtr. 2018	SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR W BEAM GUARDRAIL FLARED END TERMINAL AND MGS FLARED END TERMINAL	PLATE NUMBER 630.87 Sheet 1 of 1

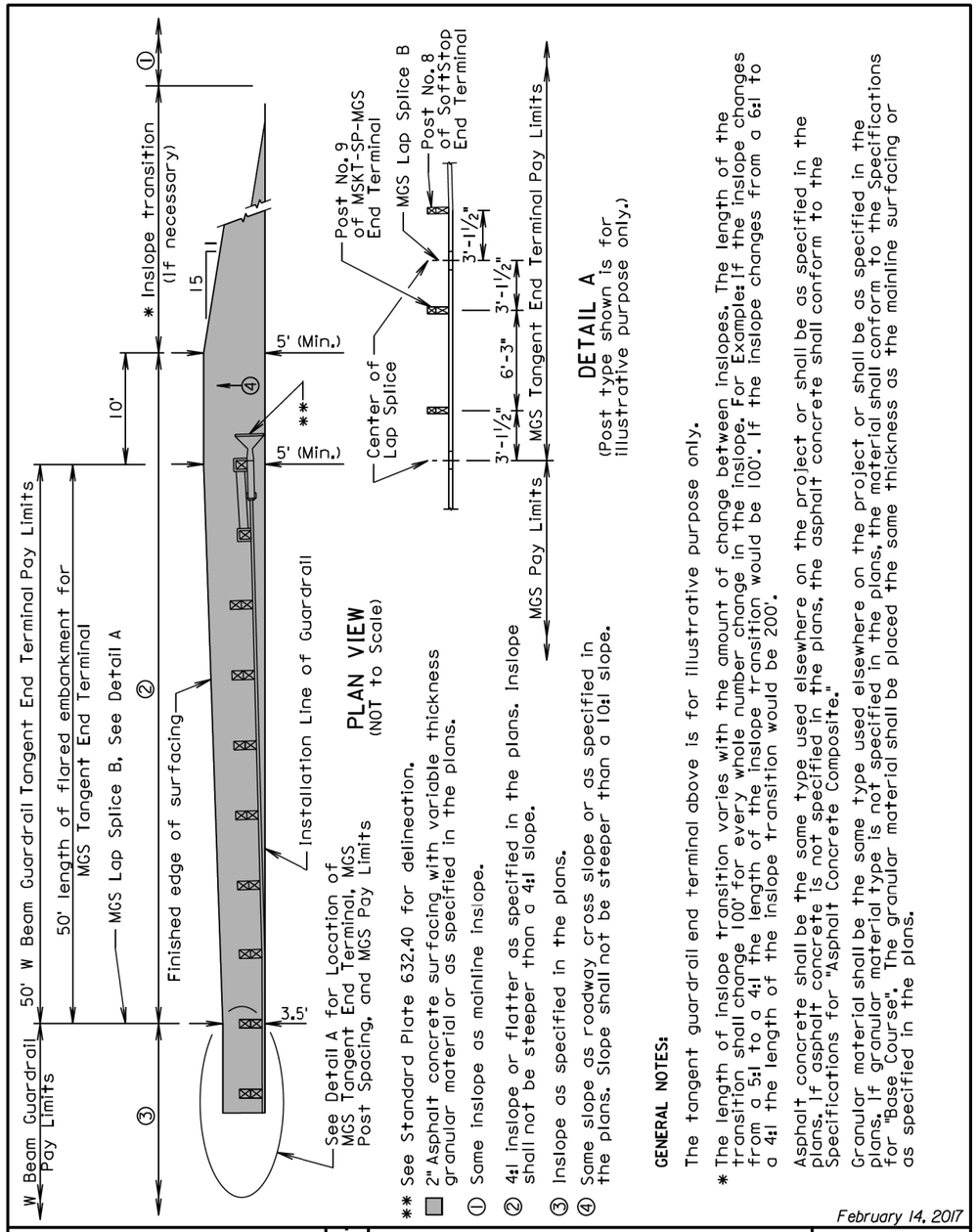
Plot Scale - 1:200

- Plotted From - Invi1n23

File - ...\Working\Standard Plates.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	51	57

Plotting Date: 03/05/2018



PLAN VIEW
(NOT to Scale)

DETAIL A
(Post type shown is for illustrative purpose only.)

** 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

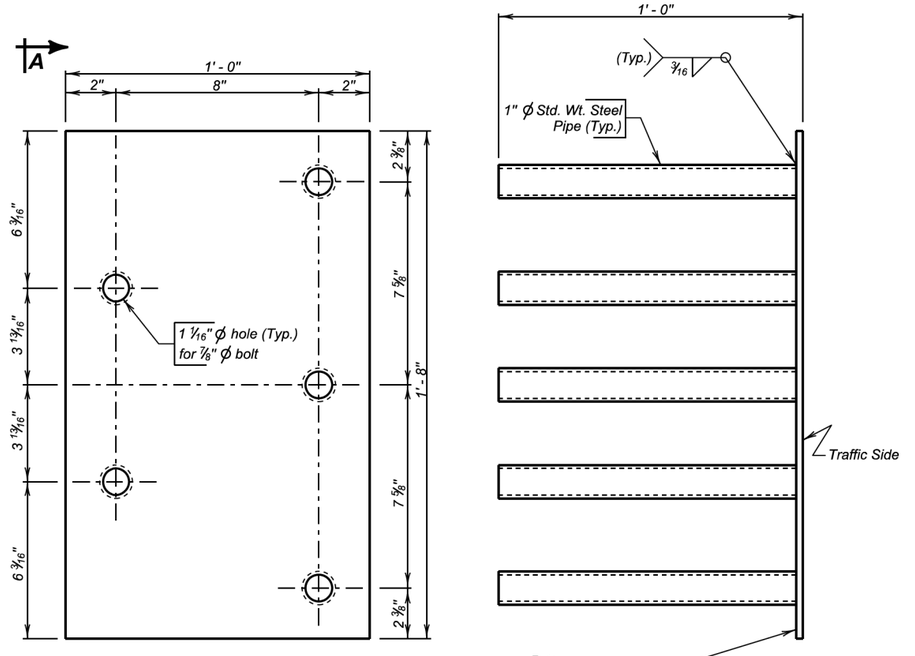
Published Date: 1st Qtr. 2018

SDDOT

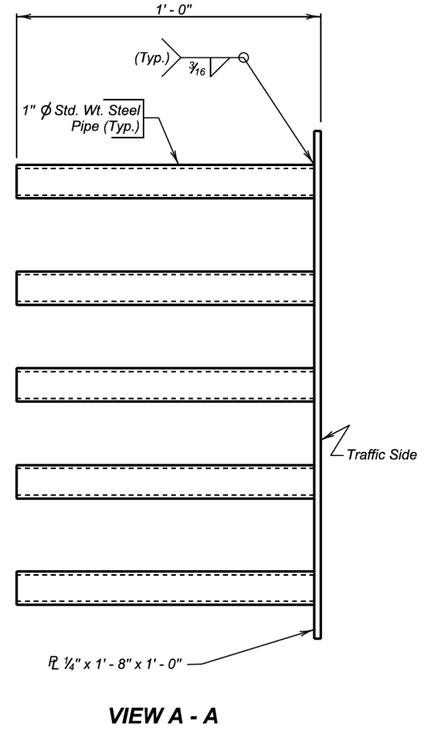
EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR W BEAM GUARDRAIL TANGENT END TERMINAL AND MGS TANGENT END TERMINAL

PLATE NUMBER 630.88

Sheet 1 of 1



ELEVATION



VIEW A - A

GENERAL NOTES:

1. *Steel plate for the insert assembly shall conform to ASTM A709 Grade 36. The steel pipes shall conform to ASTM A53 or ASTM A500 Grade B.*
2. *Welding and weld inspection shall be in conformance with AWS 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, A325, or A449. Plain washers shall be galvanized and conform to ASTM F844.*
5. *Bolt heads shall be placed on the traffic side of the endblock. Bolt projection at the back side of the insert shall not exceed 1 inch beyond the nut.*
6. *The cost of the 5 bolt insert plate assembly complete in place including welding and galvanizing shall be incidental to the contract unit price per Cubic Yard for " Class A45 Concrete, Miscellaneous ", " Class A45 Concrete, Bridge Deck ", or " Class A45 Concrete, Bridge Repair ", as applicable.*

December 23, 2013

Published Date: 1st Qtr. 2018

SDDOT

5 BOLT INSERT PLATE ASSEMBLY

PLATE NUMBER 630.92

Sheet 1 of 1

Plot Scale - 1:200

- Plotted From - twi1n123

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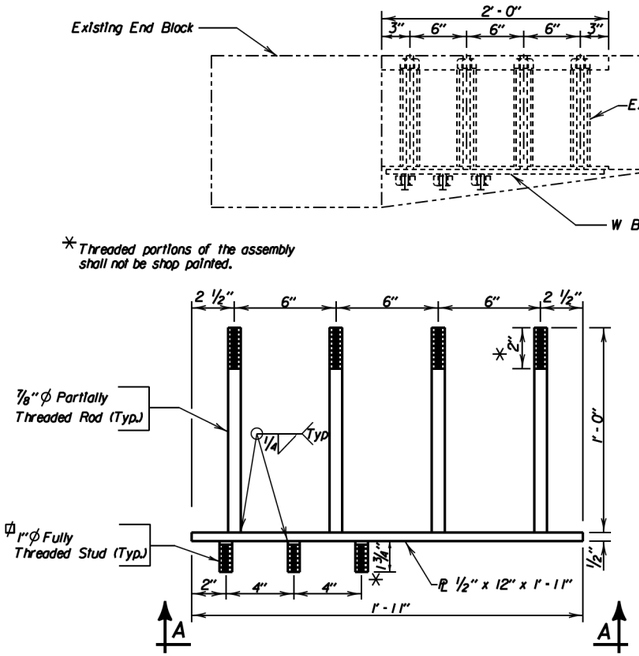
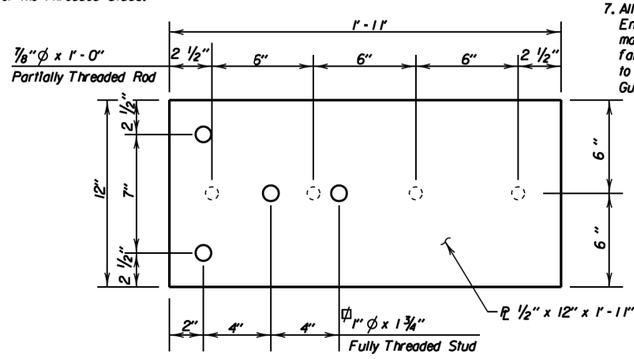
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	52	57

Plotting Date: 03/05/2018



W BEAM GUARDRAIL END BLOCK ADAPTER

ϕ If necessary, ream the 1" ϕ holes in the W Beam Terminal Connector to fit over the Threaded Studs.



VIEW A - A

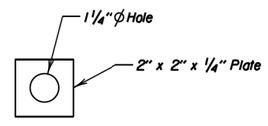


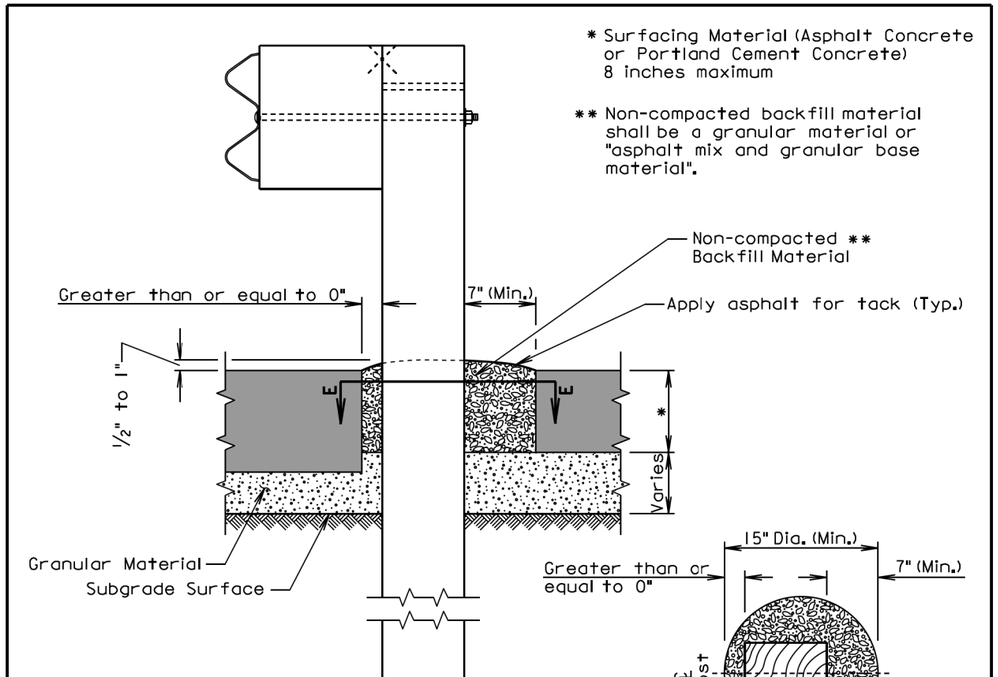
PLATE WASHER
(8 required)

GENERAL NOTES:

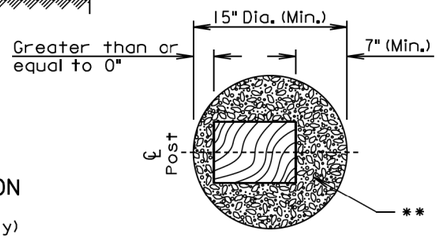
1. The steel plate shall conform to ASTM A709, Grade 36.
2. The fully threaded and partially threaded rod used in the assembly shall be in accordance with ASTM A572, Grade 50.
3. After fabrication, paint in accordance with Section 411 of the Specifications, except that only the prime coat will be required. Areas not painted in the shop will be touched up in the field following installation, with prime coat only, according to Section 411. The color of the prime coat will be gray.
4. Nuts and plate washers shall be provided with each assembly. Washers shall be made of steel and follow the dimensions shown on this sheet. Nuts shall be heavy hex and in accordance with ASTM A563. Nuts and washers shall be galvanized in accordance with ASTM F2329.
5. Washers shall be placed between the Adapter and the W Beam Terminal Connector and between the W Beam Terminal Connector and the nuts on the front.
6. Prior to fabrication, it shall be the Contractor's responsibility to field verify that the partially threaded rod spacing shown above will coincide with the existing holes in the end block and adjust if necessary.
7. All costs associated with the W Beam Guardrail End Block Adapter including labor, equipment, materials, and any incidentals necessary to fabricate and install this item shall be incidental to the contract unit price per each for "W Beam Guardrail End Block Adapter".

June 26, 2015

Published Date: 1st Qtr. 2018	SDDOT	W BEAM GUARDRAIL END BLOCK ADAPTER	PLATE NUMBER 630.94
			Sheet 1 of 1



TRANSVERSE SECTION
(Wood post shown for illustrative purpose only)



SECTION E-E
(Round option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

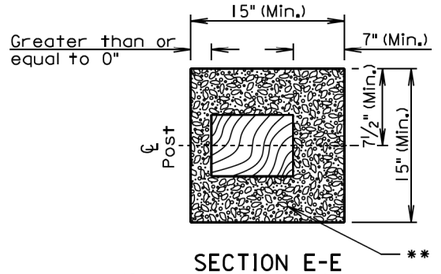
GENERAL NOTES:

The leave-out limits may be increased to accommodate construction equipment and tolerances.

The backfill material shall be mounded 1/2 inch to 1 inch above the top of the adjacent surfacing as illustrated above.

Asphalt for tack shall be applied to the surface of the backfill material at the rate of .15 to .20 gallons per square yard.

All costs for constructing the leave-out including labor, equipment, and materials which includes the backfill material and tack coat shall be incidental to the contract unit price for the respective guardrail bid item.



SECTION E-E
(Square option for leave-out and backfill limits)
(Wood post shown for illustrative purpose only)

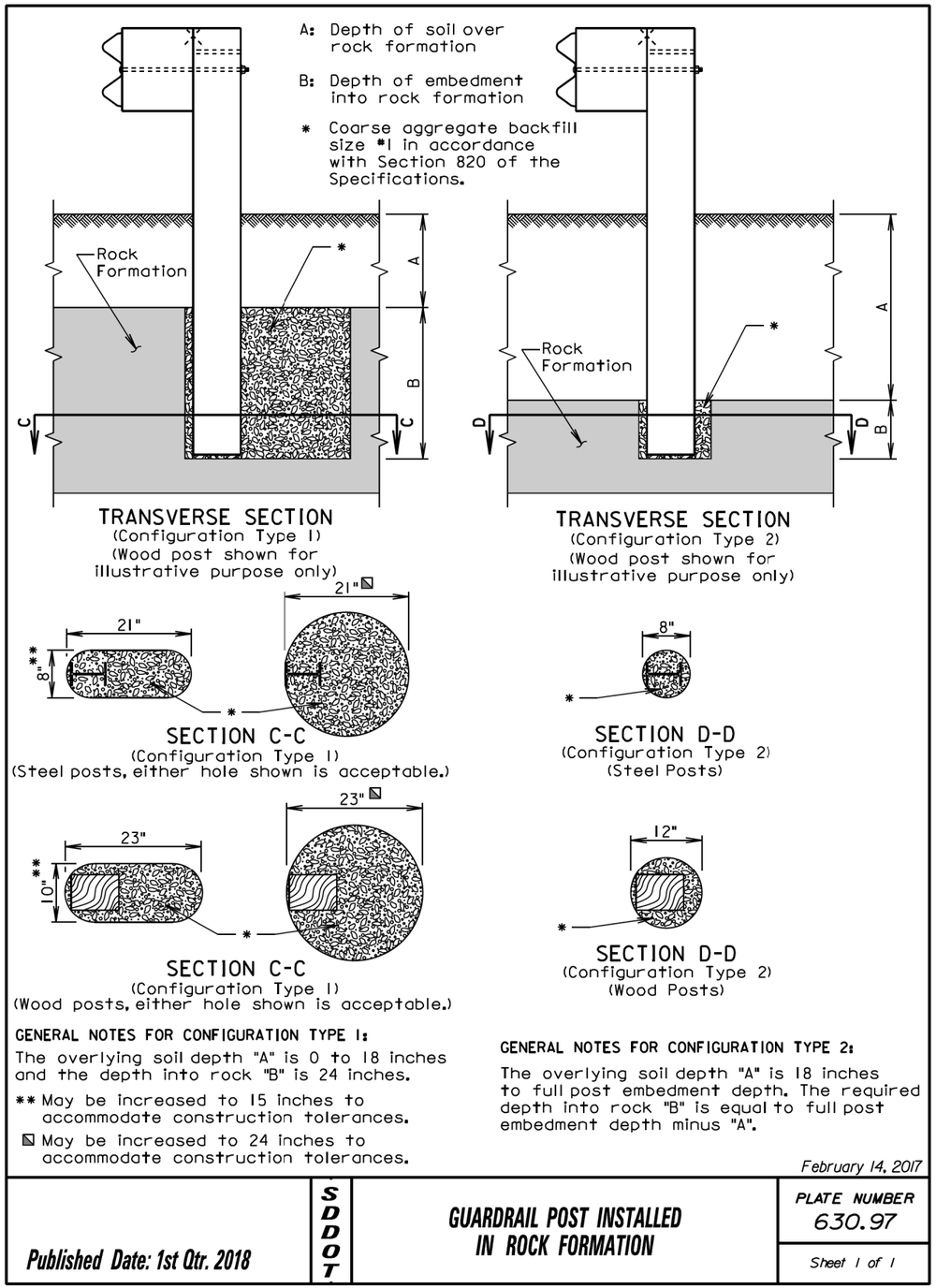
February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	GUARDRAIL POST INSTALLED IN ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE	PLATE NUMBER 630.96
			Sheet 1 of 1

Plot Scale - 1:200

- Plotted From - trwi1nt23

File - ...\Working\Standard Plates.dgn



TRANSVERSE SECTION
(Configuration Type 1)
(Wood post shown for illustrative purpose only)

TRANSVERSE SECTION
(Configuration Type 2)
(Wood post shown for illustrative purpose only)

SECTION C-C
(Configuration Type 1)
(Steel posts, either hole shown is acceptable.)

SECTION D-D
(Configuration Type 2)
(Steel Posts)

SECTION C-C
(Configuration Type 1)
(Wood posts, either hole shown is acceptable.)

SECTION D-D
(Configuration Type 2)
(Wood Posts)

GENERAL NOTES FOR CONFIGURATION TYPE 1:

The overlying soil depth "A" is 0 to 18 inches and the depth into rock "B" is 24 inches.

** May be increased to 15 inches to accommodate construction tolerances.

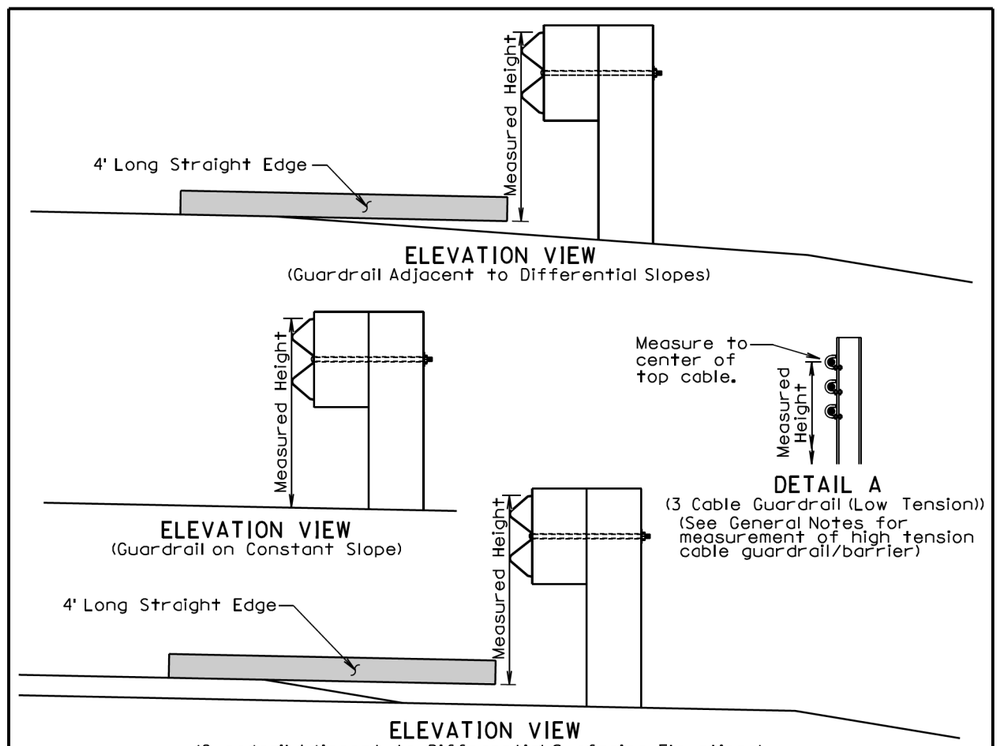
▧ May be increased to 24 inches to accommodate construction tolerances.

GENERAL NOTES FOR CONFIGURATION TYPE 2:

The overlying soil depth "A" is 18 inches to full post embedment depth. The required depth into rock "B" is equal to full post embedment depth minus "A".

February 14, 2017

Published Date: 1st Qtr. 2018	SDDOT	GUARDRAIL POST INSTALLED IN ROCK FORMATION	PLATE NUMBER 630.97
			Sheet 1 of 1

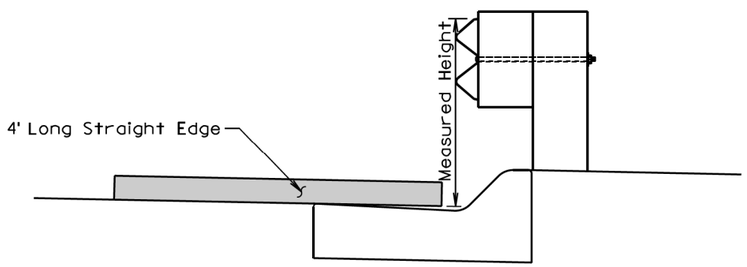


ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)

ELEVATION VIEW
(Guardrail on Constant Slope)

DETAIL A
(3 Cable Guardrail (Low Tension))
(See General Notes for measurement of high tension cable guardrail/barrier)

ELEVATION VIEW
(Guardrail Adjacent to Differential Surfacing Elevations)



ELEVATION VIEW
(Guardrail at Curb and Gutter)

GENERAL NOTES:

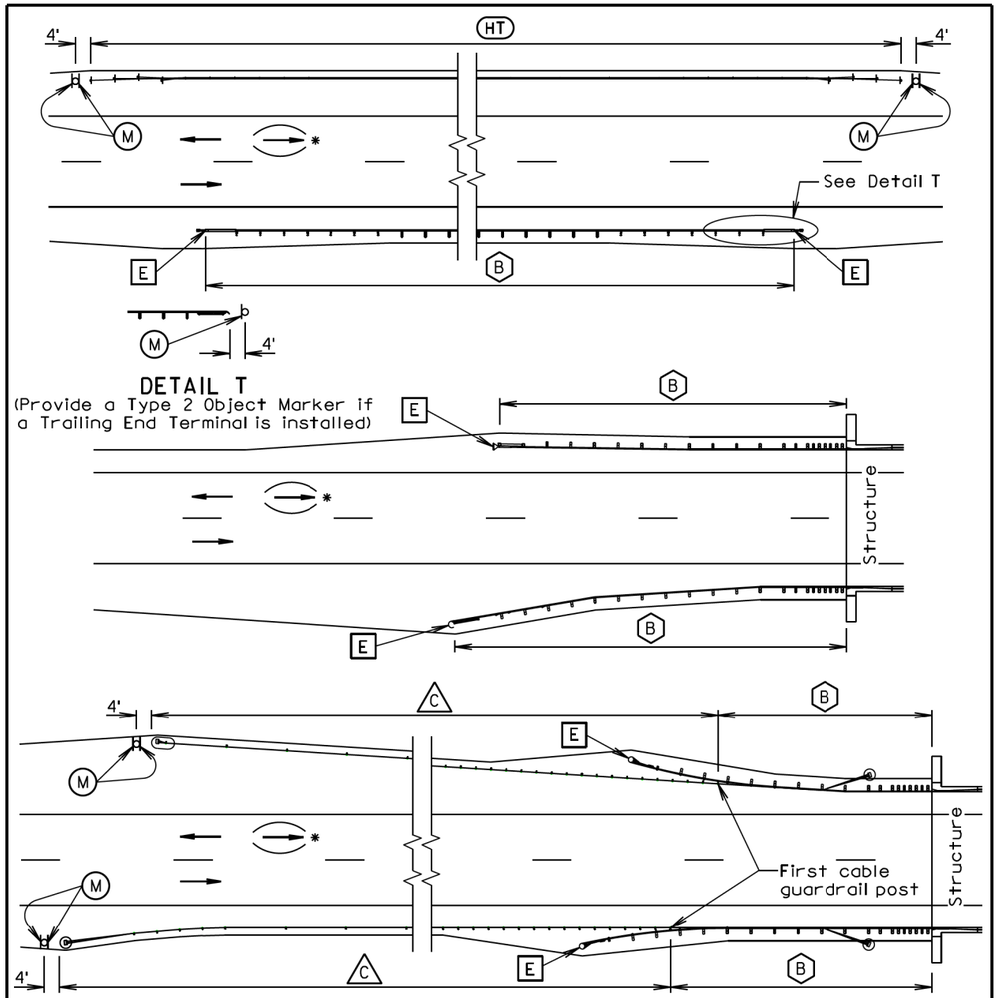
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier shall be measured in accordance with this standard plate.

When measuring height of 3 cable guardrail (low tension) the height shall be measured to the center of the top cable. See Detail A.

The height of high tension cable guardrail/barrier shall be measured in accordance with the Manufacturer's installation instructions.

December 23, 2017

Published Date: 1st Qtr. 2018	SDDOT	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
			Sheet 1 of 1



TYPICAL GUARDRAIL LAYOUTS

B Steel Beam Guardrail Delineation

E Guardrail End Terminal Object Marker

C 3 Cable Guardrail Delineation

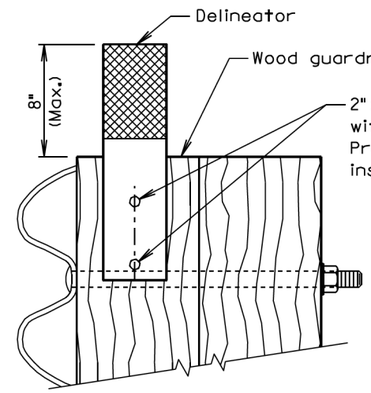
HT High Tension Cable Guardrail Delineation

M Type 2 Object Marker

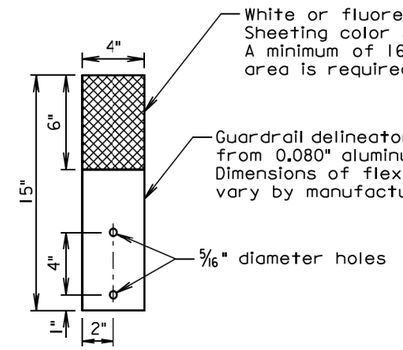
* For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 9, 2017

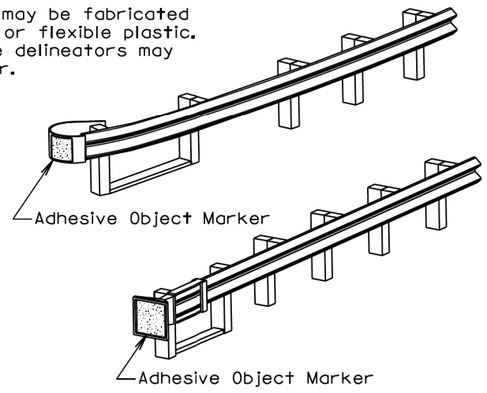
Published Date: 1st Qtr. 2018	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 1 of 4



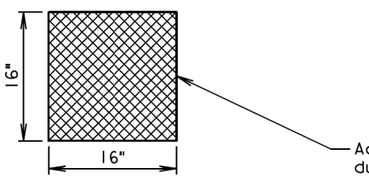
B STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



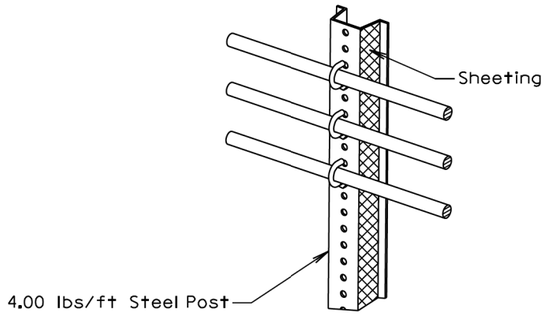
E GUARDRAIL END TERMINAL OBJECT MARKER



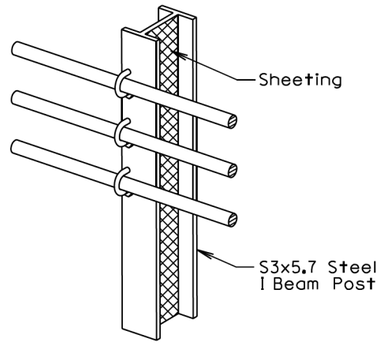
ADHESIVE OBJECT MARKER

June 9, 2017

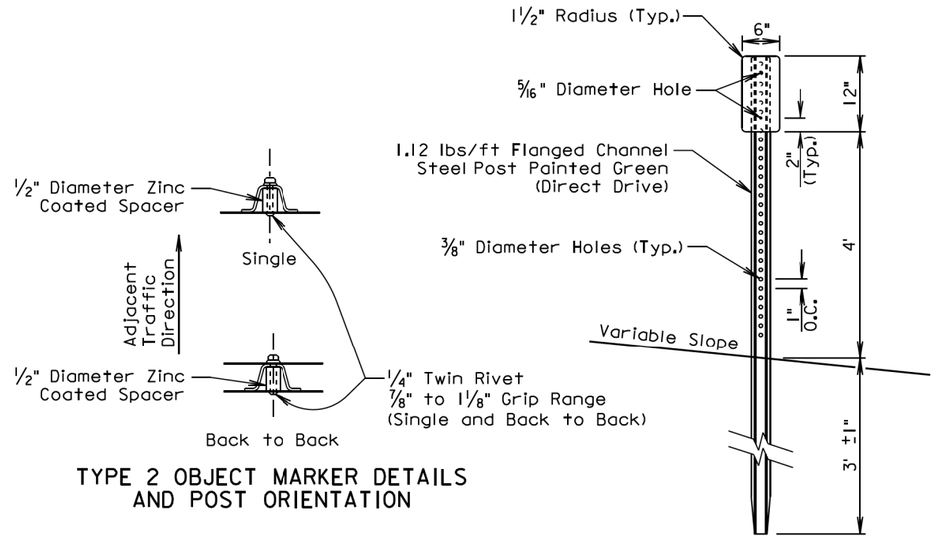
Published Date: 1st Qtr. 2018	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4



Ⓒ 3 CABLE GUARDRAIL DELINEATION



Ⓒ 3 CABLE GUARDRAIL DELINEATION



TYPE 2 OBJECT MARKER DETAILS
AND POST ORIENTATION

Ⓜ TYPE 2 OBJECT MARKER

(For Marking 3 Cable Guardrail Anchor,
High Tension Cable Guardrail Anchor,
and Trailing End Terminal)

June 9, 2017

Published Date: 1st Qtr. 2018	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

GENERAL NOTES:

The delineation of high tension cable guardrail shall be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting shall be type XI in conformance with ASTM D4956. The color of the reflective sheeting shall be the same as the nearest pavement marking.

The delineators for steel beam guardrail and sheeting on 3 cable guardrail posts shall be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting shall be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting shall be on both sides of the delineators and guardrail posts 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.

When steel beam guardrail is attached to a bridge the first delineator shall be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators shall be placed in addition to the end terminal yellow object marker. The spacing between the delineators shall be approximately one third of the length of the guardrail.

At bridges with guardrail 200 feet and greater in length, including bridges that have steel beam guardrail transitioning to 3 cable guardrail, the delineators shall be placed at a spacing of approximately 50 feet. Delineation shall extend throughout the length of the guardrail system.

Steel beam guardrail that is not attached to a bridge and is less than 200 feet in length, a minimum of 4 delineators shall be placed in addition to the end terminal yellow object markers. The spacing between the delineators shall be approximately one third of the length of the guardrail.

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail, the delineators shall 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 on 3 cable guardrail and steel beam guardrail shall be included in the contract unit price per each for "Guardrail Delineator".

All costs for furnishing and installing the reflective sheeting on the cable spacers or post caps for the high tension cable guardrail shall be incidental to the respective high tension cable guardrail bid item.

An adhesive object marker shall be placed on the end of the W beam guardrail or MGS 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 type XI sheeting in conformance with ASTM D4956. 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, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") shall have fluorescent yellow type XI sheeting in conformance with ASTM D4956. 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 9, 2017

Published Date: 1st Qtr. 2018	SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	56	57

Plotting Date: 03/05/2018

◎ Reflectorized Drum

■ Channelizing Device

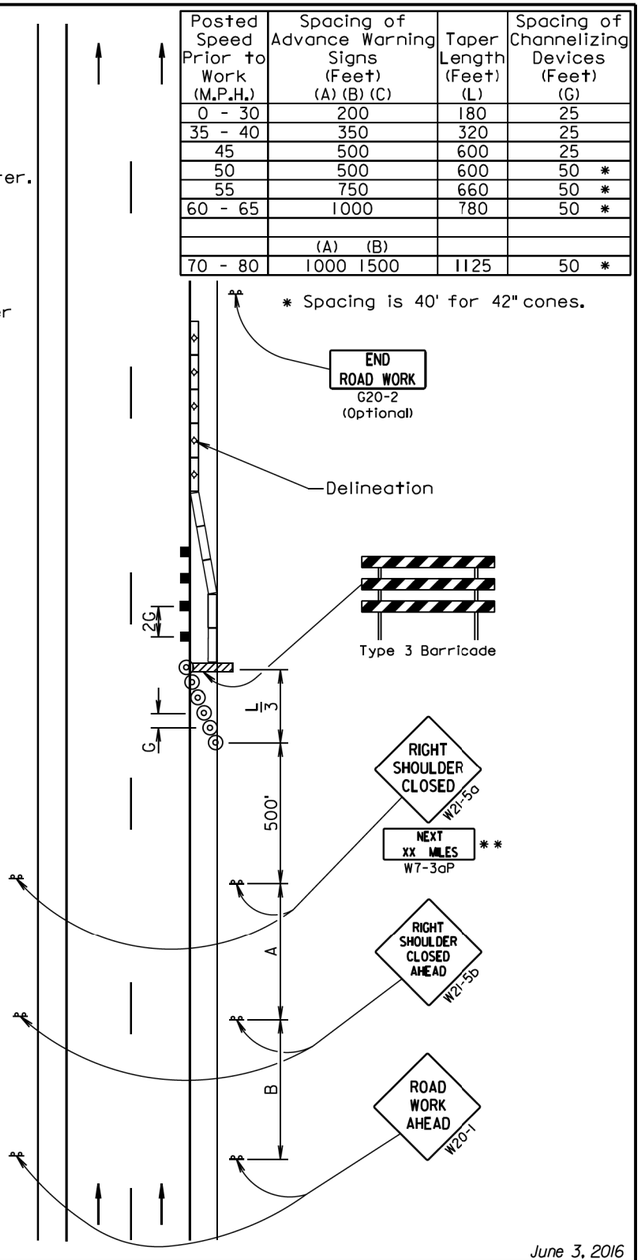
▭ Movable Concrete Barrier

** For distances ½ mile or greater.

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

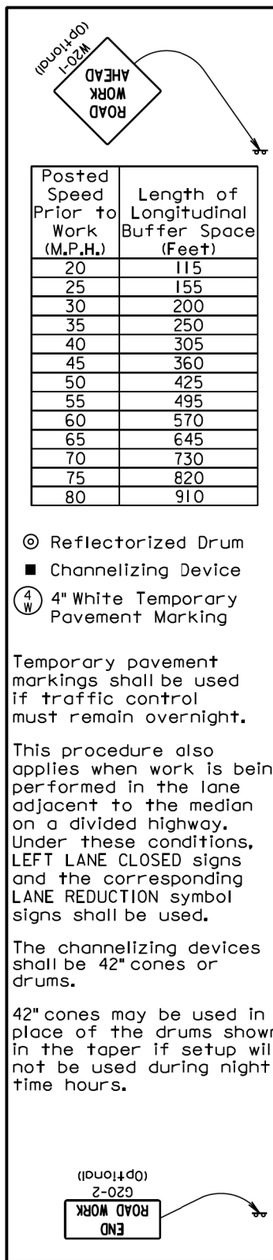
This standard plate shows one method which may be used to close a shoulder of a roadway for a long term project. The Highway Authority will determine if the use of barriers is required. If barriers are required, the layout details will be included elsewhere in the plans.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	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 *
	(A) (B)		
70 - 80	1000 1500	1125	50 *



June 3, 2016

Published Date: 1st Qtr. 2018	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES SHOULDER CLOSED	PLATE NUMBER 634.61 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.

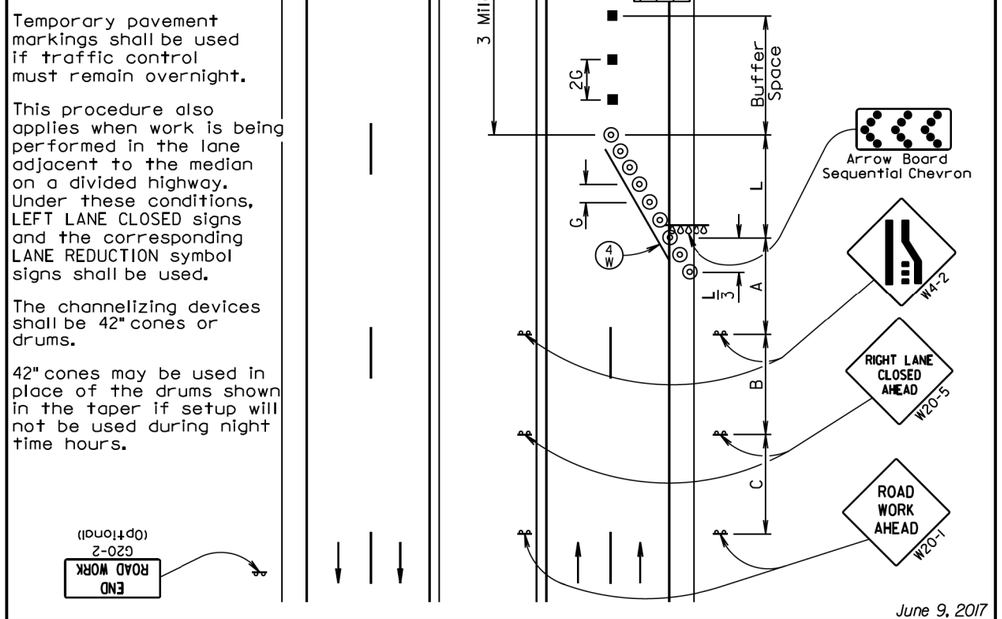
The channelizing devices shall be 42" cones or drums.

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.



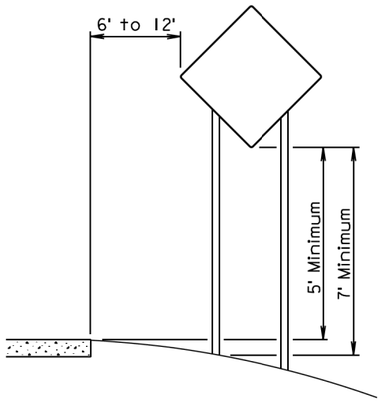
June 9, 2017

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

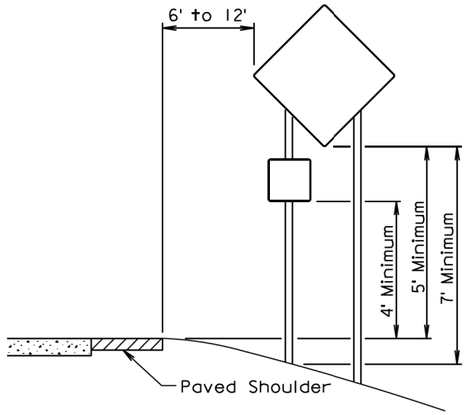
Plot Scale - 1:200

- Plotted From - tnvi1nt23

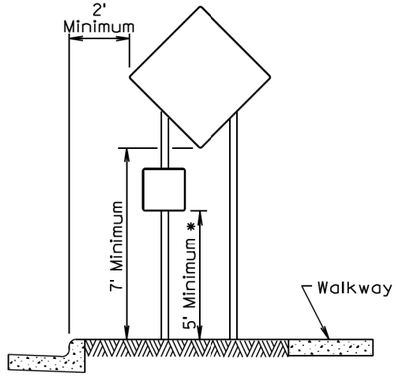
File - ...\Working\Standard Plates.dgn



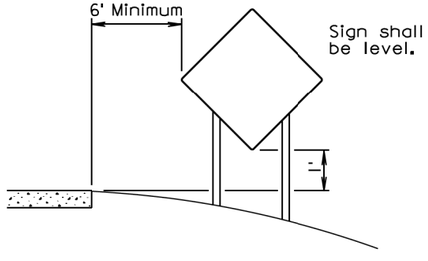
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

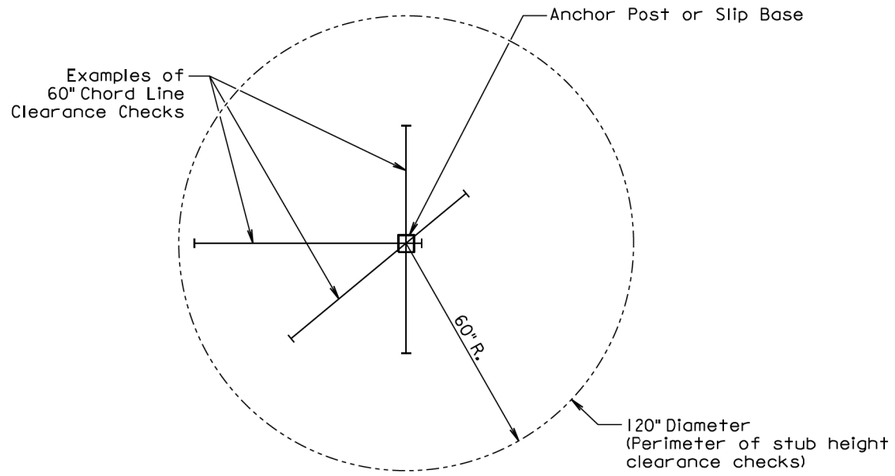


RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

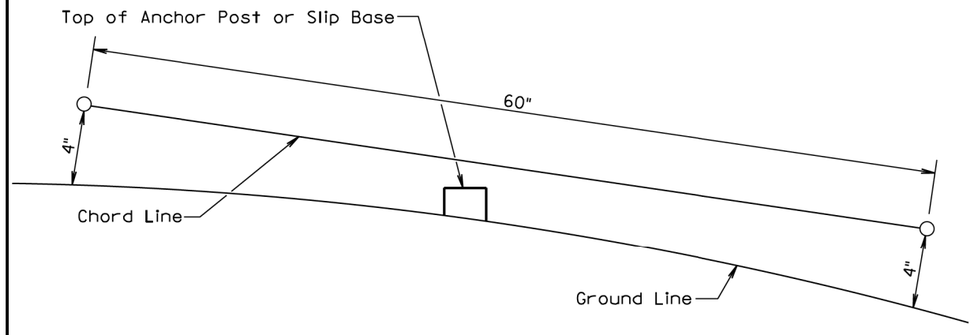
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

September 22, 2014

Published Date: 1st Qtr. 2018	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

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