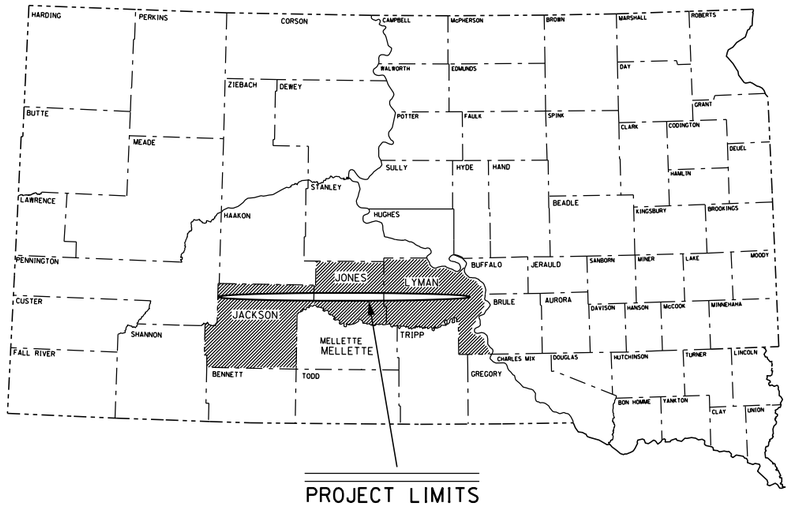
PLOT SCALE - 1:39555.8

PLOTTED FROM - TRW1INT23

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-391	1	35

Plotting Date: 03/16/2015



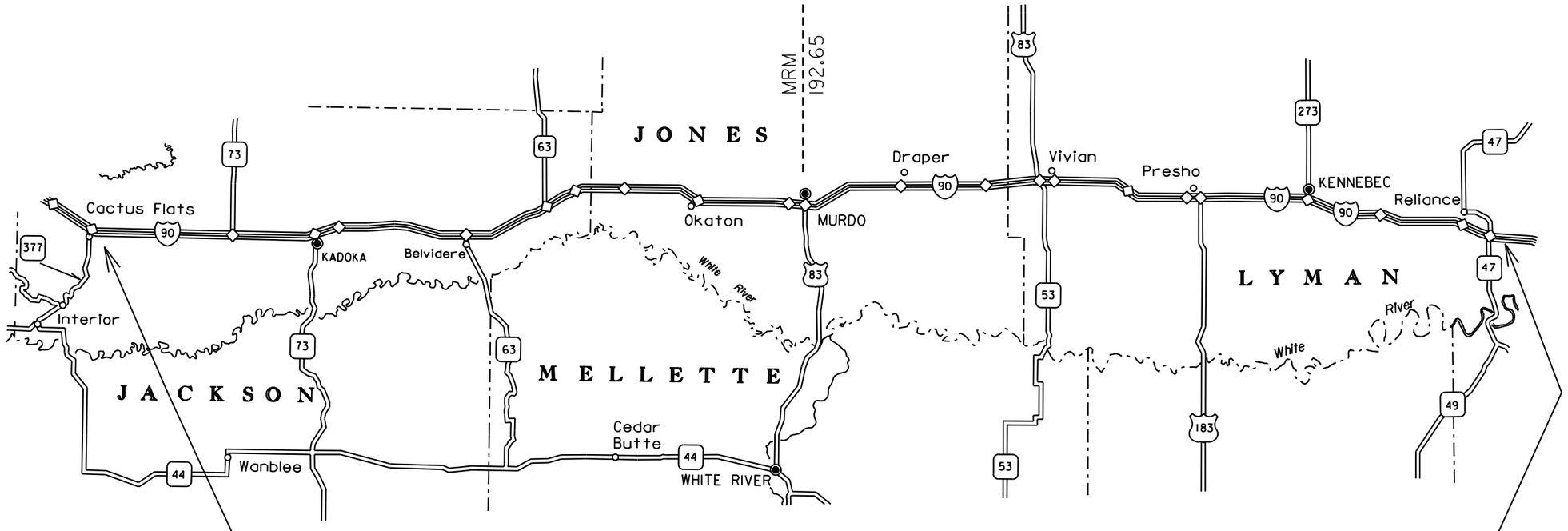
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
000I–391
INTERSTATE 90
JACKSON, JONES, & LYMAN COUNTIES

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

PCN 13my

PLAN SHEET INDEX

← West mobilization area | East mobilization area →



Start project at MRM 130.3

End project at MRM 251.6

STORM WATER PERMIT
(None Required)

PLOT NAME - 1

FILE - ...\REVIEW\JACK_13MY.DGN

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	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
110E6230	Remove W Beam Guardrail for Reset	25.0	Ft
120E0600	Contractor Furnished Borrow	25	CuYd
260E1100	Base Course, State Furnished	25.0	CuYd
320E1902	State Furnished Asphalt Concrete Cold Mix	25.0	CuYd
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	450	Ft
629E1000	Repair 3 Cable Guardrail	3,750	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	5	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	5	Each
629E1180	High Tension Cable Guardrail Post Strap	5	Each
629E1181	High Tension Cable Guardrail Cable Spacer	5	Each
629E2115	Cable	50	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
630E2010	W Beam Guardrail End Terminal	1	Each
630E2030	W Beam Guardrail Breakaway Cable 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
630E5160	Reset W Beam Rail	12.5	Ft
630E5220	Reset Rubrail	12.5	Ft
630E5520	Drive Down Beam Guardrail Post	10	Each
630E5530	Remove and Reset Beam Guardrail Post and Block	10	Each
634E0010	Flagging	10	Hour
634E0100	Traffic Control	3,000	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	Each

SPECIFICATIONS

Standard Specifications for Roads & Bridges, 2004 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 B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

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

Action Taken/Required:

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

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

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

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

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

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

COMPLETION DATE

The contract will become effective on July 1, 2015 and will expire on July 1, 2016.

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.

ESTIMATED 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.

MOBILIZATION

Mobilization 1 is the cost of mobilization per each time the Contractor is called in by 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 is called in by 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 called 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

Traffic control shall be in accordance with Section 634 of the specifications and the plan notes. Traffic shall be maintained in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

The Contractor shall designate an employee whose primary responsibility is for the maintenance of traffic, 24 hours a day and 7 days a week. The designated person must have sufficient training and experience in the field of construction traffic control and be knowledgeable about the Manual of Uniform Traffic Control Devices (MUTCD). The cost of the traffic control person shall be incidental to the contract lump sum price for TRAFFIC CONTROL, MISCELLANEOUS. The employee selected shall be approved by the Engineer. 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 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 counted 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 may have tabs or be hinged to expedite changing the message but they will be considered as one sign for payment. Traffic control devices will be counted and paid each time the Contractor is mobilized to repair guardrail. The Type C Advance Warning Arrow Panel bid item, 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 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.

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

Storage of vehicles and equipment shall be as near the right-of-way as possible. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

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

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 his 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 1000 feet in front of flagger station.

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 on sheets 8-12 of these plans.

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 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

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. Measured from anchor to anchor.

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. Bid item may be used for furnishing and installing cable for high tension (prestretched) or low tension (prestretched or non-prestretched) cable guardrail. This item is used for a typical repair if a cable is damaged and a new piece needs to be installed. Payment for 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 630.15, 630.20, 630.21, and 630.50 for post spacing 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 requirements of NCHRP Report Number 350 Test Level 3 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. The Engineer shall designate the proper post length of six, six and one-half, or seven feet as needed to fit the repair situation.

10. 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 of 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.

11. The Contractor shall place “State Furnished Asphalt Concrete Cold Mix” around the posts to fill and level any voids created by the driving of the posts through the asphalt. This material will be available at the SDDOT Murdo Maintenance Yard. The material shall be placed ½” high around the post to force the water to drain away from the post.

12. The Contractor shall notify the Winner Area Engineer or designated representative if any guardrail delineation is damaged which cannot be repaired by bolting/riveting to new posts or guardrail installed by Contractor as part of repair. The new delineation items will be installed by SDDOT Maintenance forces. See Standard Plate 632.40 for guardrail delineation requirements.

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) and Reliance, legal description of SW1/4, Section 35, T105N, R73W; (Exit 250). This material can be used without testing.

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 price per cubic yard 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 ASPHALT CONCRETE COLD MIX

The Contractor may be required to place State Furnished Asphalt Concrete Cold Mix on this project. This Asphalt Concrete Cold Mix shall be compacted to the satisfaction of the Engineer.

State Furnished Asphalt Concrete Cold Mix type material will be supplied by the SDDOT and will be available from the SDDOT Maintenance Yard located at Murdo, legal description of NE1/4, Section 13, T2S, R28E; (Exit 192).

The final quantity to be paid will be based on loose volume of cubic yards hauled in each truckload. All costs for placement of asphalt cold mix shall be incidental to the contract price per cubic yard for "State Furnished Asphalt Concrete Cold Mix".

This material is royalty free to the Contractor.

Furnish cost to the State for State Furnished Asphalt Concrete Cold Mix type material is $81.00 per ton. This project will use a conversion factor of 1.9 ton per cubic yard for this material.

CONTRACTOR FURNISHED BORROW

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". 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.

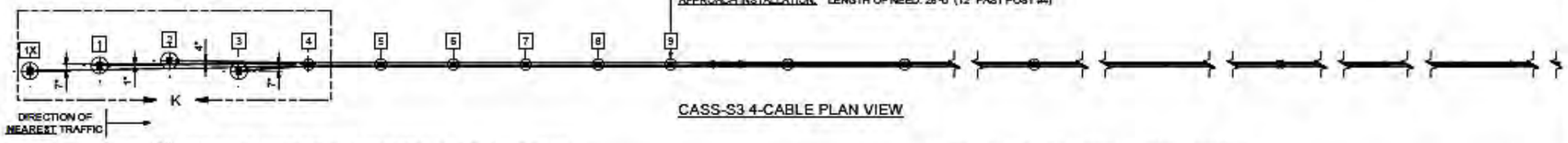
Slopes and berms disturbed shall be leveled and excess material removed. Area shall be tilled to the minimum depth of three inches and seeded with Intermediate Wheatgrass (Oahe) at the rate of one-half (1/2) pound "Pure Live Seed" per 1000 square feet. The seed shall be noxious weed free. Cost for reshaping,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

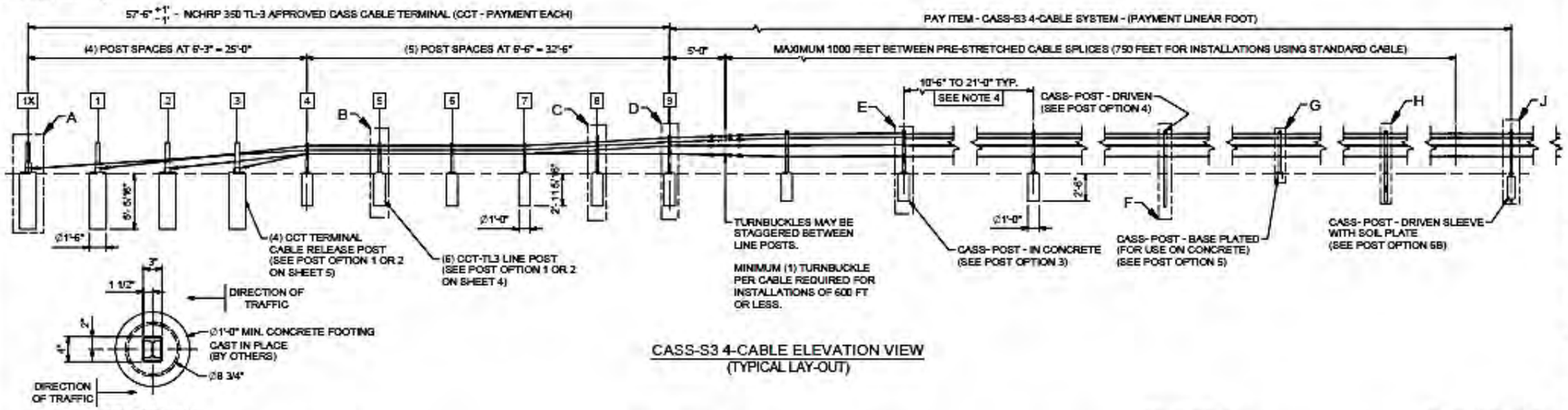
SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	34	68
W7-3aP	NEXT __ MILES (plaque)	2	36" x 30"	23	46
W20-1	ROAD WORK AHEAD	3	48" x 48"	34	102
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	34	68
W20-7	FLAGGER (symbol)	2	48" x 48"	34	68
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	34	68
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD	2	48" x 48"	34	68
G20-2	END ROAD WORK	3	48" x 24"	24	72
*****	TYPE 3 BARRICADE - 8' single sided	1	*****	40	40
				TOTAL UNITS	**600**

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	000I-391	8	35

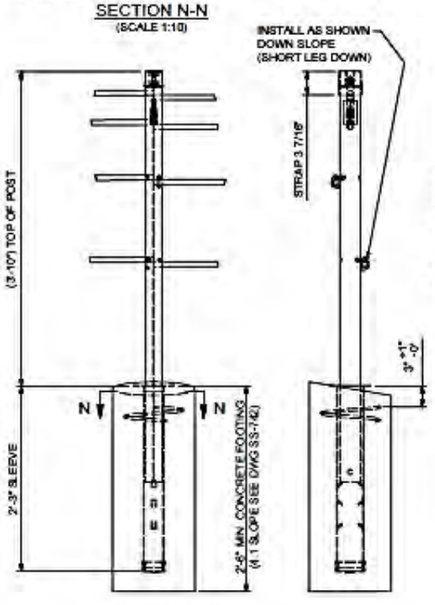


CASS-S3 4-CABLE PLAN VIEW

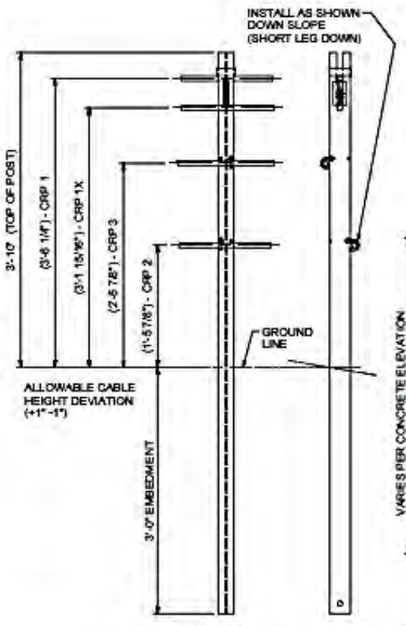


CASS-S3 4-CABLE ELEVATION VIEW
(TYPICAL LAY-OUT)

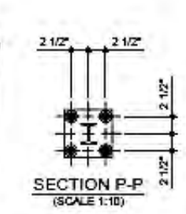
SECTION N-N
(SCALE 1:10)



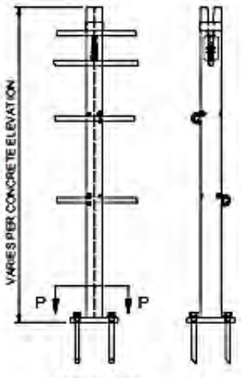
DETAIL E
(CASS POST IN CONCRETE)
(POST OPTION #3 SHOWN)



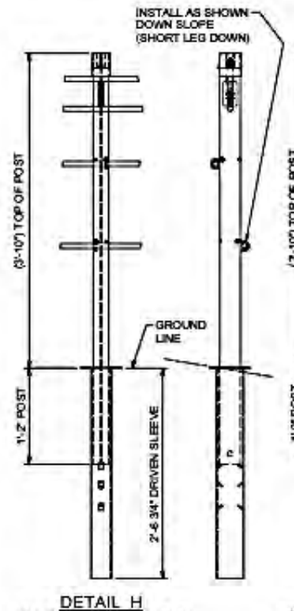
DETAIL F
(CASS POST - DRIVEN)
(POST OPTION #4 SHOWN)



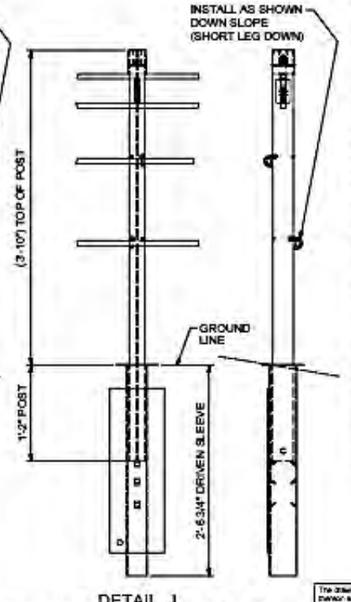
SECTION P-P
(SCALE 1:10)



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 AND ACCEPTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 TEST LEVEL 3 (NCHRP 350 TL3) FOR VARIOUS POST SPACING WHEN INSTALLED ON A 4:1 OR FLATTER SLOPE. CASS-S3 4-CABLE (4:1) HAS BEEN SUCCESSFULLY TESTED AND ACCEPTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 TEST LEVEL 4 (NCHRP 350 TL4) FOR VARIOUS POST SPACING WHEN INSTALLED ON A 6:1 OR FLATTER SLOPE. ADDITIONAL INFORMATION CAN BE FOUND IN FHWA ACCEPTANCE LETTER B-141F.

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 A NON-CRASHWORTHY ANCHOR (CCA) IS USED TO TERMINATE THE CABLE SYSTEM, THE NON-CRASHWORTHY ANCHOR MUST BE EITHER SHIELDED OR LOCATED SO THAT A VEHICLE IMPACTING THE CABLE CAN NOT IMPACT THE NON-CRASHWORTHY ANCHOR.

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. **WHEN THE SYSTEM & TERMINAL IS INSTALLED ENTIRELY ON A 4:1 OR FLATTER SLOPE, THE DEPTH OF THE CONCRETE FOOTINGS SHALL BE INCREASED BY 6". (SEE DRAWING SS-742) ALL OTHER DIMENSIONS, VARIOUS SPECIFICATIONS AND SOIL QUALIFICATIONS REMAIN IN PLACE AND MUST BE FOLLOWED.**

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

11. 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 - 5 - IN CONCRETE
2	CCT -TERMINAL POST 1 - 5 - 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_6:1

CASS-S3 (6:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY PRODUCTS, LLC

SPEC:
SHIPPING WT:
DRW: E.A.S. 11/4/2010
CHK:
SHT: 1 OF 5 SIZE: D
DWG NO: SS-743 REV: 0

ss-ss-743_TL4_S3_6Tr_4Cbl.dgn

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	000I-391	9	35

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

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

PARTS LIST - CASS-S3 POST BASE-PLATED - OPTION #5

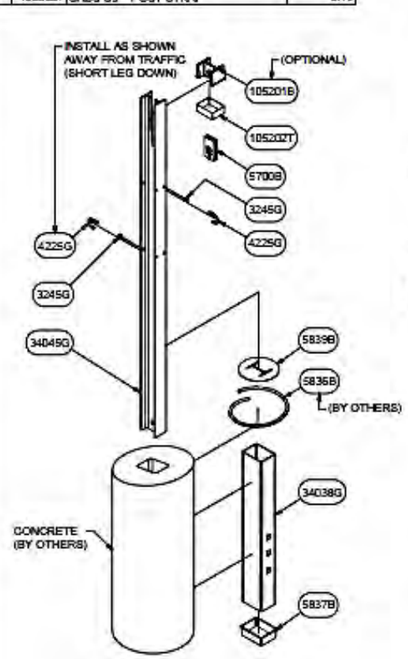
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 DIA. HEX NUT (A563)	0.01
4	3300G	5/8" PLAIN WASHER - TYPE B - R - (F844)	0.06
4	3310G	5/8 LOCK WASHER	0.00
4	3361G	5/8" HEX NUT (A563 Gr DH)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
4	5225G	5/8 x 7 1/2" HAS SUPER ROD CHSL PT (A193 B7)	0.62
0.6	5448B	HIT HY 150 MAX EPOXY (HILTI - 00293648)	
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

PARTS LIST - CASS-S3 POST - IN DRIVEN SLEEVE - POST OPTION

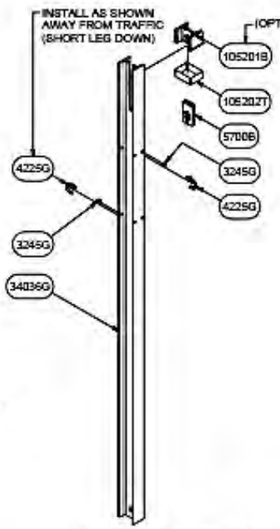
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 DIA. HEX NUT (A563)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
1	5700B	CASS & TL3 CABLE SPACER	0.11
1	5839B	SLEEVE COVER - S3 POST	0.11
1	34039G	27" POST SLEEVE - DRIVEN	13.97
1	34045G	CASS-S3 POST - SHORT	28.06
1	105201B	CASS-S3 POST CAP	0.13
1	105202T	CASS-S3 - POST STRAP	0.19

PARTS LIST - PRE-STRETCHED CABLE ASSEMBLIES

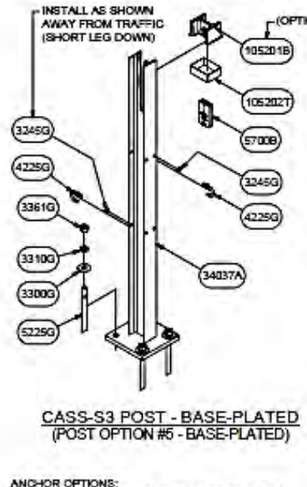
QTY	PART No	TITLE	LENGTH	TERM-1	TERM-2	Lbs / Each
1	5817	OCT CABLE ASSEMBLY-TOP	54'-4"	R.H.T.	L.H.T.	58.3
1	5818	OCT CABLE ASSEMBLY-MID	48'-1"	R.H.T.	L.H.T.	52.3
1	5819	OCT CABLE ASSEMBLY-BOT	41'-10"	R.H.T.	L.H.T.	46.3
1	5867	QCA CABLE ASSEMBLY	26'-0"	R.H.T.	L.H.T.	30.9
1	5816	CABLE ASSEMBLY-INTERIOR	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	5775	CABLE FIELD SPLICE SECTION	450'	R.H.T.	NONE	435.9
1	5776	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



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



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



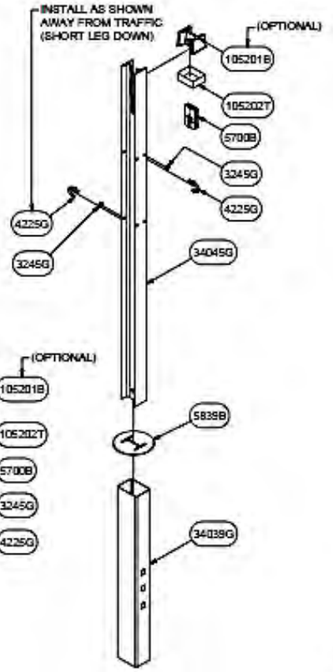
CASS-S3 POST - BASE-PLATED
(POST OPTION #5 - BASE-PLATED)

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

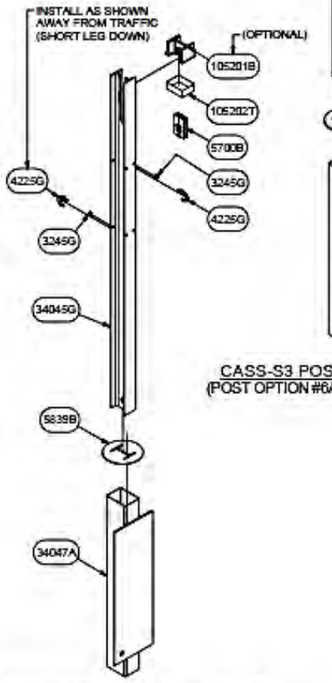
1: 5/8 ADHESIVE ANCHORING SYSTEM.
(4 EACH 3300G, 3310G, 3361G & 5225G) & 0.6 EACH 5448B

2: 5/8 x 8" ALL THREADED ROD (A449) WITH EPOXY.
(4 EACH 3300G, 3310G, 3361G & 5722G) & 0.6 EACH 5448B

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



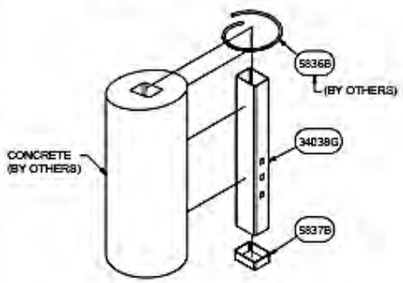
CASS-S3 POST - IN DRIVEN SLEEVE
(POST OPTION #6A - DRIVEN SLEEVE - NOTCH)



CASS-S3 POST - IN DRIVEN SLEEVE
(POST OPTION #6B - DRIVEN SLEEVE - SOIL PLATE)

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



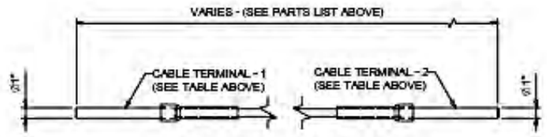
CONCRETE FOOTING ASSEMBLY
(POST OPTION #3 - PRE-CAST OPTION)

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

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.
   LONG SPLICE POST 34061G IN LIEU OF LONG CASS-S3 POST 34036G
   SHORT SPLICE POST 34049G IN LIEU OF SHORT CASS-S3 POST 34045G
3. IF REQUIRED PER PROJECT PLANS SUPPLY:
   CABLE PULLING TOOL 5850B
   CABLE TENSION METER 5878B
   CABLE THERMOMETER 5705B

CASS-S3 (6:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY PRODUCTS, LLC

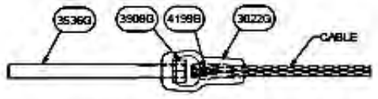
PROJ: CASS-S3_6:1

SPEC:
SHIPPING WT:
DRW: E.A.S. 11/4/2010
CHK:
SHT: 2 OF 5 SIZE: D
DWG NO: SS-743 REV 0

file: SS-743 TL4 S1 SHT 4C.dwg

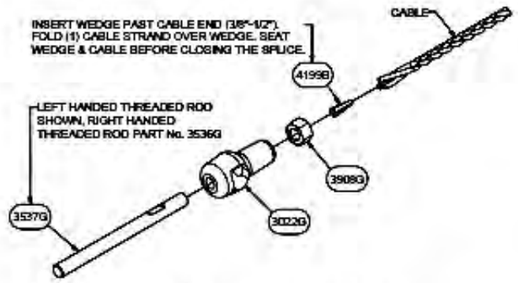
TRINITY HIGHWAY PRODUCTS CASS-S3 4-CABLE GUARDRAIL SAFETY SYSTEM

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	000I-391	10	35



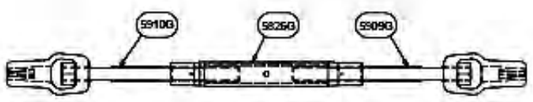
1" CABLE FIELD SPLICE - 5909G & 5910G
(5910G SHOWN, 5909G SIMILAR)

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



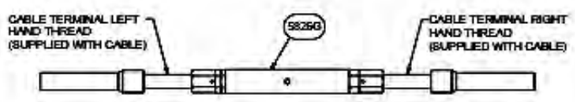
ASSEMBLY - 1" CABLE FIELD SPLICE - 5909G
(5909G SHOWN, 5910G SIMILAR)

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	3909G	1" HEAVY HEX NUT (A563 DH)	0.47
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08



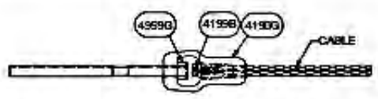
1" CABLE SPLICE - 5633G
(CLOSED BODY STYLE)

PARTS LIST - 5633G			
QTY	PART No	TITLE	Lbs / Each
1	5825G	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



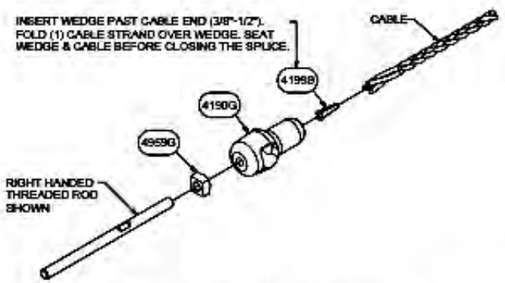
1" TURNBUCKLE - 5826G
(CLOSED BODY STYLE)

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



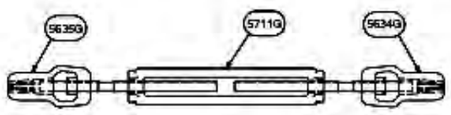
3/4" CABLE FIELD SPLICE - 5634G & 5635G
(5634G SHOWN, 5635G SIMILAR)

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



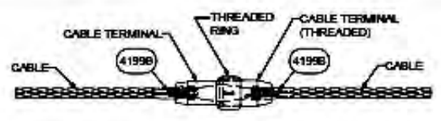
ASSEMBLY - 3/4" CABLE FIELD SPLICE - 5635G
(5635G SHOWN, 5634G SIMILAR)

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



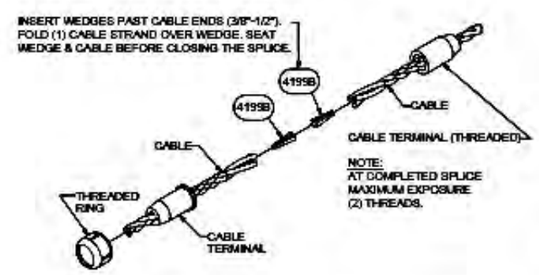
3/4" CABLE SPLICE - 5698G
(OPEN BODY STYLE)

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	10.68



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	STD. CABLE	PRE-STRETCHED
DEGREES	LB/FORCE	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_6:1

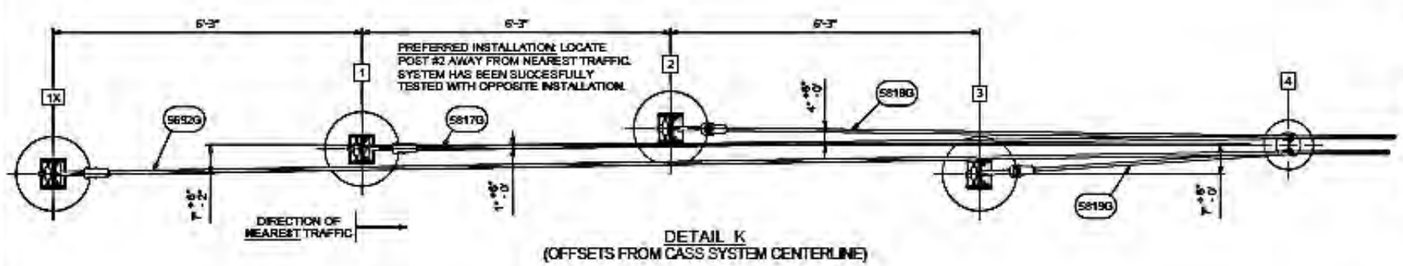
CASS-S3 (6:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY PRODUCTS, LLC

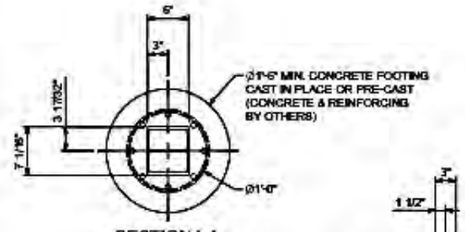
SPEC:
SHIPPING WT:
DRW E.A.S. 11/4/2010
CHK:
SHT 9 OF 5 SIZE: D
DWG NO: SS-743 REV 0

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

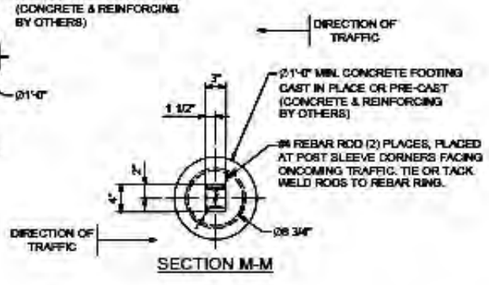
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	000I-391	11	35



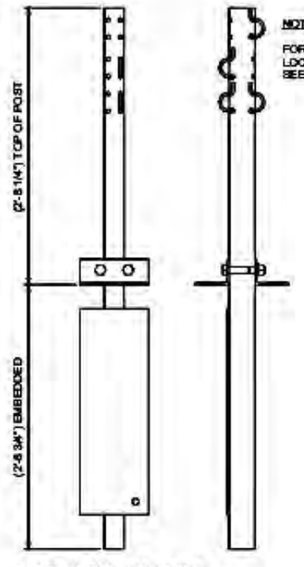
DETAIL K
(OFFSETS FROM CASS SYSTEM CENTERLINE)



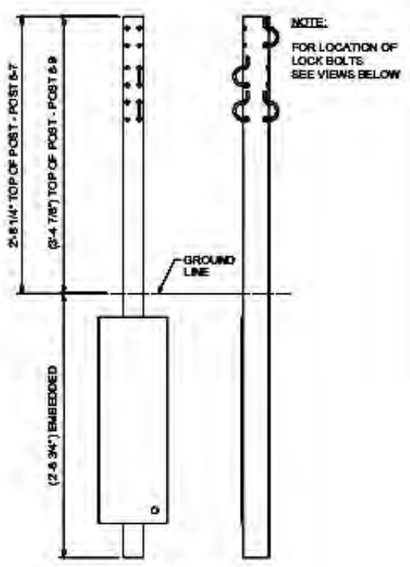
SECTION L-L



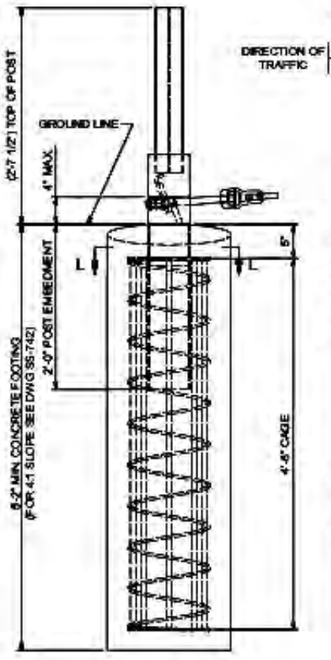
SECTION M-M



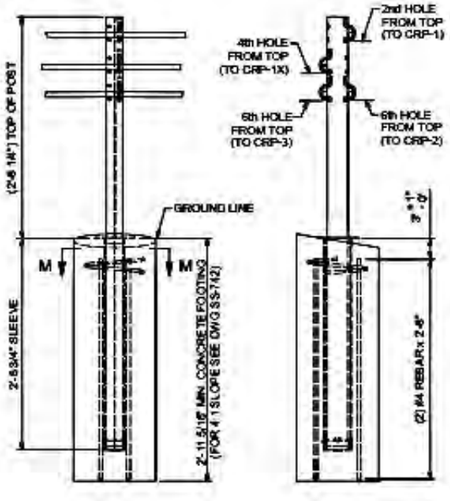
CCT TERMINAL POST
(CCT POST 4)
(POST OPTION 2 SHOWN)



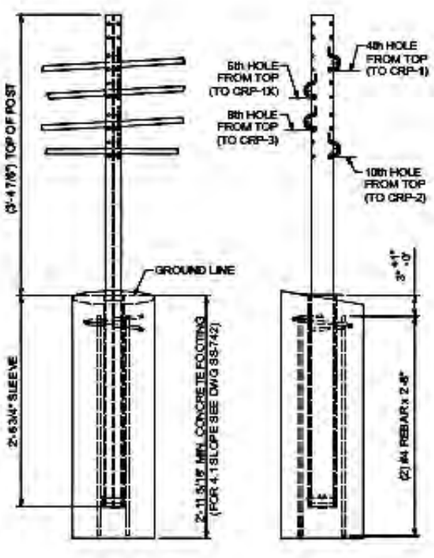
CCT TERMINAL POST
(CCT - POST 5 - 9)
(POST OPTION #2 SHOWN)



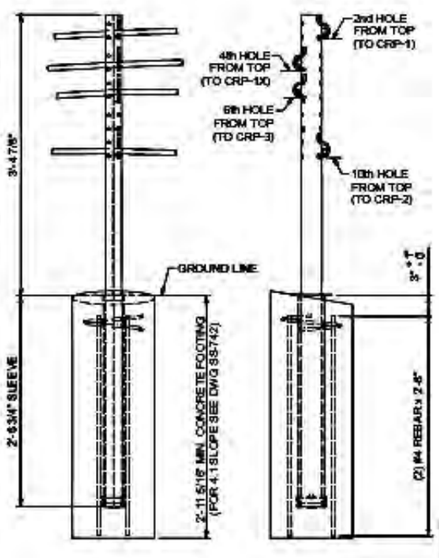
DETAIL A
(CABLE RELEASE POST 1-3)



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)

CASS-S3 (6:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY PRODUCTS, LLC

SPEC:	
SHIPPING WT:	
DRW: E.A.S	11/4/2010
CHK:	
SHT 4 OF 5	SIZE: D
PROJ: CASS-S3_S:1	DWG NO: SS-743 REV: 0

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	000I-391	12	35

PARTS LIST - CCT CABLE RELEASE POST No. 1X-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	51.90
1	33935A	CRP - UPPER POST	31.57

PARTS LIST - CCT TERMINAL POST No. 4-7 - 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	5837B	SLEEVE CAP - CASS-TERMINAL POST	0.12
1	5838B	SLEEVE COVER - S3 ANCHOR POST	0.11
2	5919B	#4 REBAR - TERMINAL POST	1.78
1	33908B	SLEEVE - TERMINAL LINE POST	13.80
1	33910G	350-TL3 TERMINAL POST	28.63

PARTS LIST - CCT CABLE RELEASE POST No. 1X-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

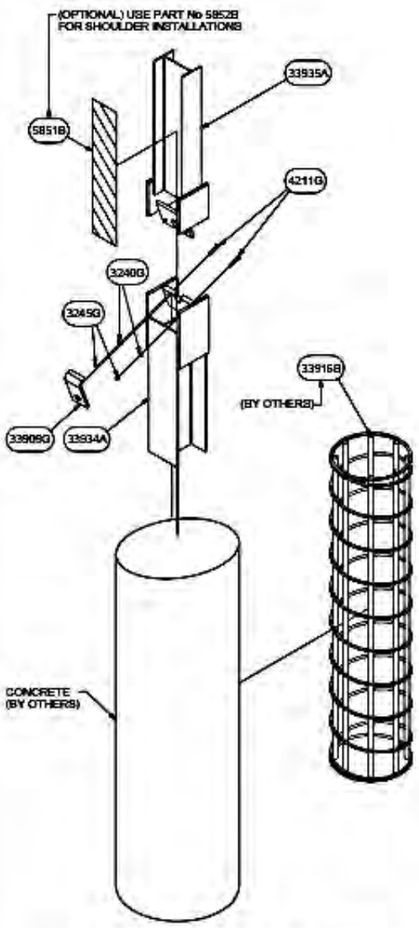
PARTS LIST - CCT TERMINAL POST No. 4-7 WITH SOIL PLATE			
QTY	PART No	TITLE	Lbs / Each
4	3245G	5/16 DIA. HEX NUT (A563)	0.01
2	3701G	3/4" FLAT WASHER (F436)	0.01
2	3711G	3/4" HEX NUT (A194 2H)	0.02
2	4779G	3/4" HEX BOLT x 4 1/2" (A325)	0.09
4	5825G	CABLE LOCK BOLT (A307)	0.12
2	9021G	BEARING ANGLE (A36)	3.81
1	33903A	350-TL3 TERMINAL POST w/ SOIL PLATE	42.25

PARTS LIST - CCT TERMINAL POST No. 8-9 - WITH SOIL PLATE			
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	33988A	350-TL4 TERMINAL POST w/ SOIL PLATE	46.02

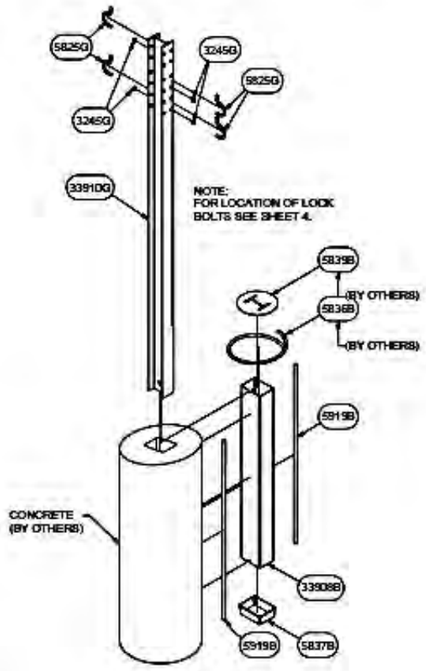
PARTS LIST - CCT TERMINAL POST No. 8-9 - IN CONCRETE			
QTY	PART No	TITLE	Lbs / Each
4	3245G	5/16 DIA. HEX NUT (A563)	0.01
4	5825G	CABLE LOCK BOLT (A307)	0.12
1	5836B	CONCRETE REINFORCING RING	0.88
1	5837B	SLEEVE CAP - CASS-TERMINAL POST	0.12
1	5838B	SLEEVE COVER - S3 ANCHOR POST	0.11
2	5919B	#4 REBAR - TERMINAL POST	1.78
1	33908B	SLEEVE - TERMINAL LINE POST	13.80
1	33955G	350-TL4 TERMINAL POST	32.42

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

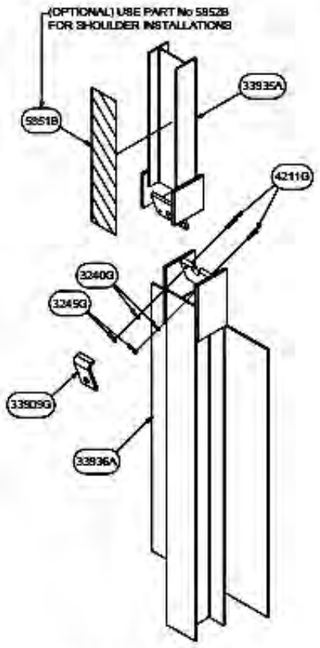
PART No. 3359SG: (1) SET OF TERMINAL HARDWARE FOR 1" CABLE FITTINGS.
PART No. 3359SG: (1) SET OF TERMINAL HARDWARE FOR 3/4" CABLE FITTINGS.



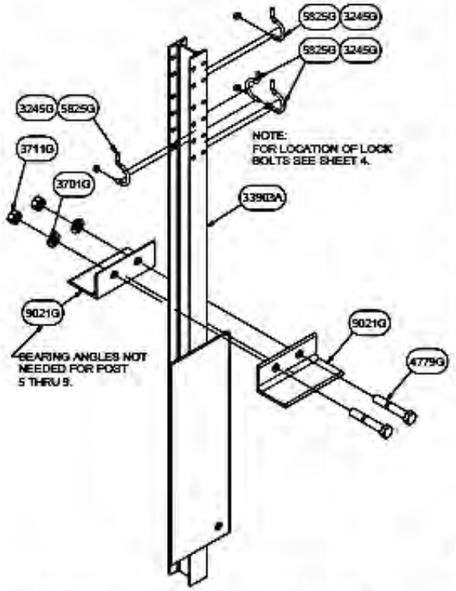
CRP TERMINAL POST - IN CONCRETE
(CCT TERMINAL POST 1X - 3)
(POST OPTION #1 SHOWN)



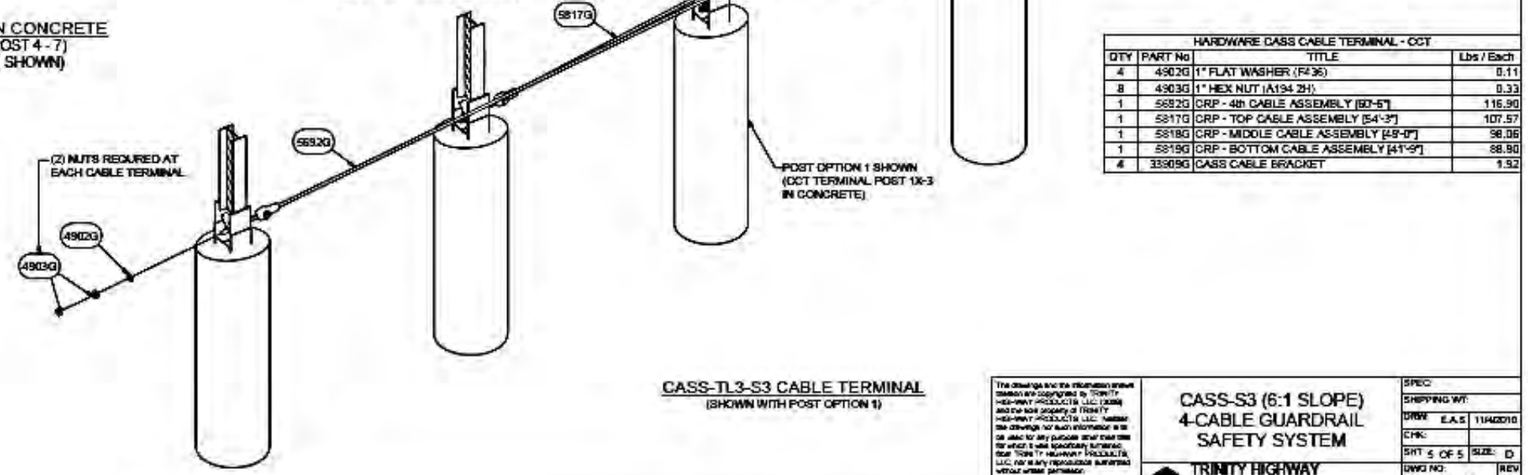
TERMINAL POST - IN CONCRETE
(CCT TERMINAL POST 4 - 7)
(POST OPTION #1 SHOWN)



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)



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 [50'-5"]	116.90
1	5817G	CRP - TOP CABLE ASSEMBLY [54'-3"]	107.57
1	5818G	CRP - MIDDLE CABLE ASSEMBLY [49'-0"]	98.06
1	5819G	CRP - BOTTOM CABLE ASSEMBLY [41'-9"]	88.90
4	33909G	CASS CABLE BRACKET	1.92

PROJ: CASS-S3_6:1

CASS-S3 (6:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

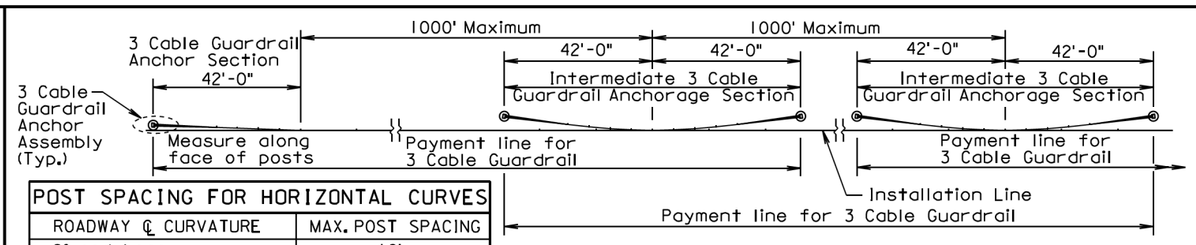
TRINITY HIGHWAY PRODUCTS, LLC

SPEC:
SHIPPING WT:
DRW: E.A.S 11/4/2010
CHK:
SHT 5 OF 5 SIZE: D
DWG NO: SS-743 REV 0

Published Date: 1st Qtr. 2014

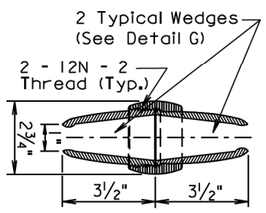
SDDOT

3 CABLE GUARDRAIL



PLAN

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



CABLE SPLICE

GENERAL NOTES:

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

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

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

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

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

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

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

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

Temperature Range (Deg.)	120 to 110	109 to 100	99 to 90	89 to 80	79 to 70	69 to 60	59 to 50	49 to 40	39 to 30	29 to 20	19 to 10	9 to 0	-1 to -10	-11 to -20
Spring Compression (In.)	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼

PLATE NUMBER 629.01

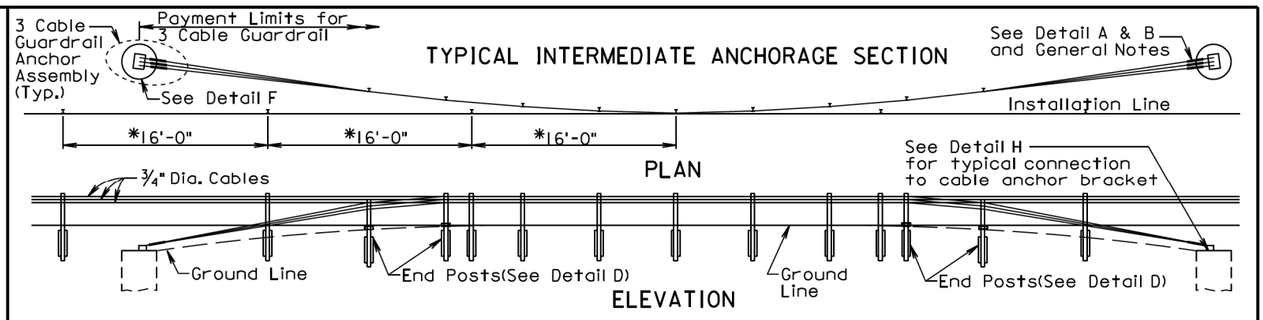
Sheet 1 of 6

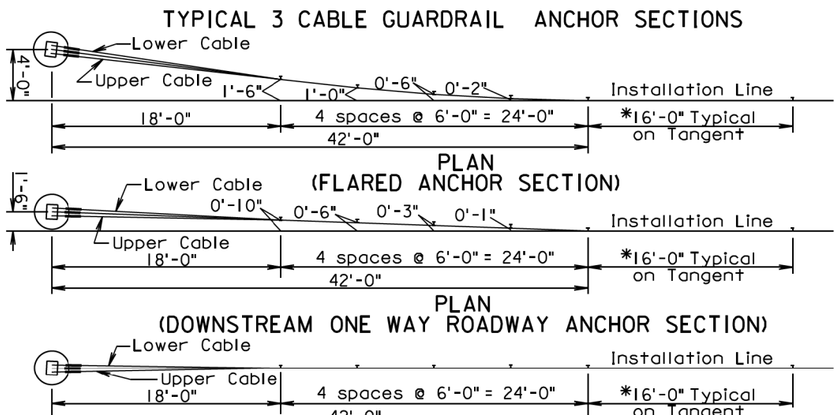
December 23, 2010

Published Date: 1st Qtr. 2014

SDDOT

3 CABLE GUARDRAIL





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

** See Standard Plate 630.98

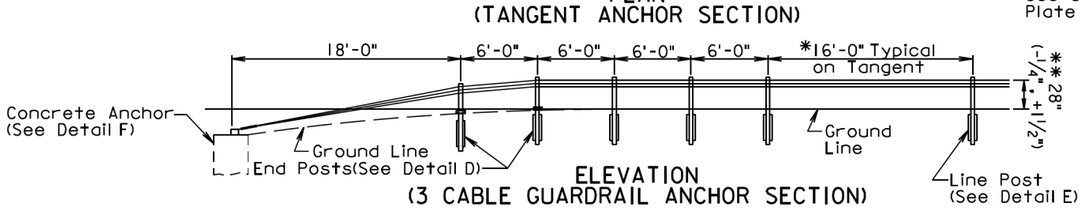


PLATE NUMBER 629.01

Sheet 2 of 6

December 23, 2010

Plotting Date: 04/18/2014

STATE OF SOUTH DAKOTA

PROJECT 0001391

SHEET 13

TOTAL SHEETS 35

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SDDOT
3 CABLE GUARDRAIL
PLATE NUMBER 629.01
Sheet 3 of 6
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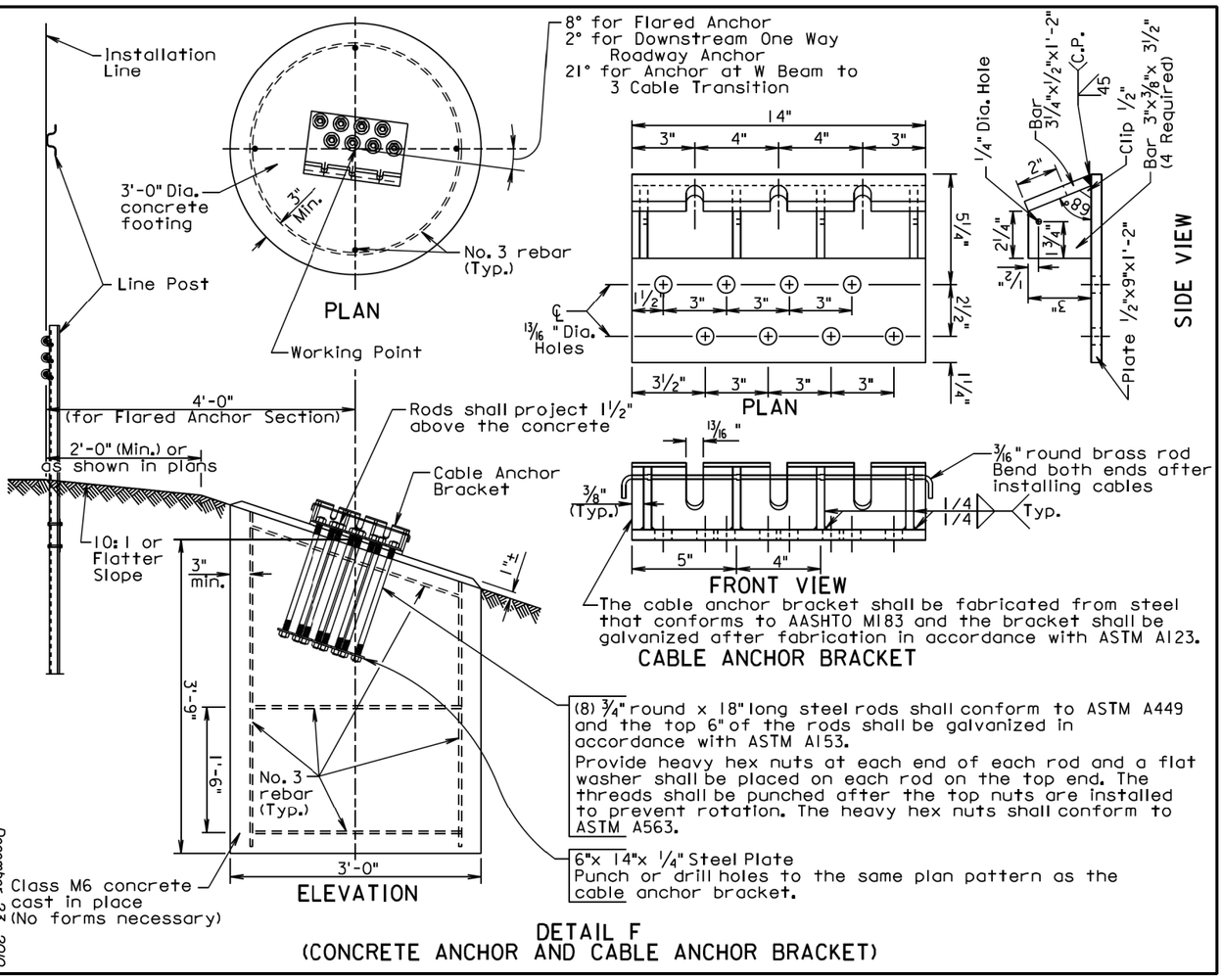

DETAIL F
(CONCRETE ANCHOR AND CABLE ANCHOR BRACKET)

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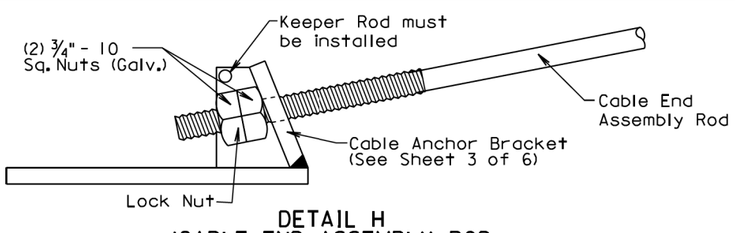
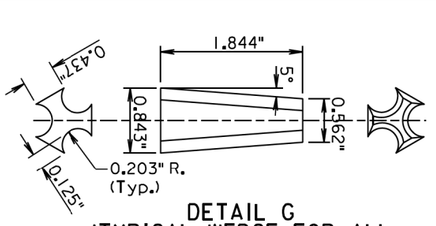
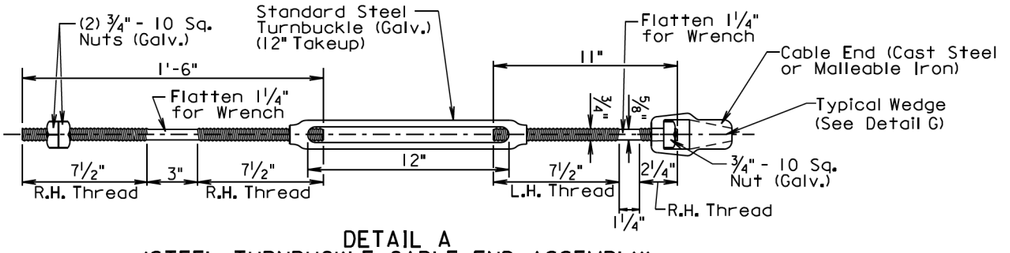


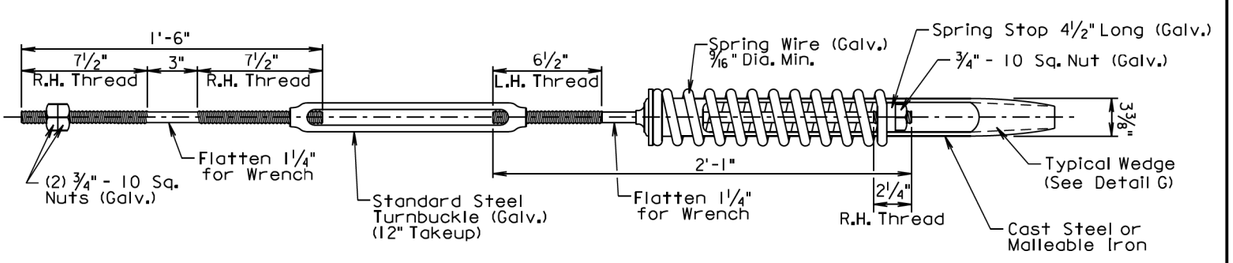
DETAIL H
(CABLE END ASSEMBLY ROD
CONNECTION TO CABLE ANCHOR BRACKET)



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



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



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

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3 CABLE GUARDRAIL

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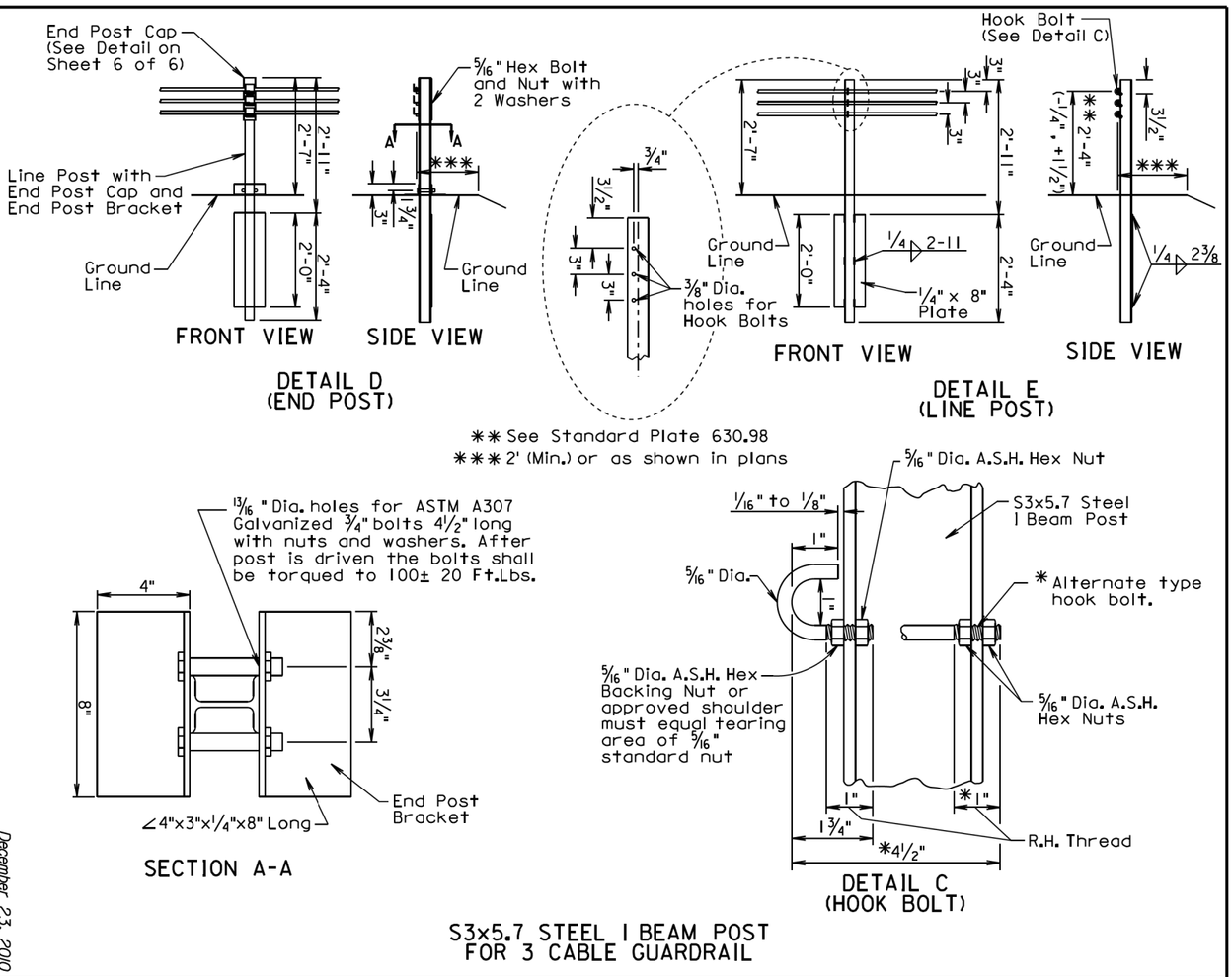

S3x5.7 STEEL I BEAM POST FOR 3 CABLE GUARDRAIL

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3 CABLE GUARDRAIL

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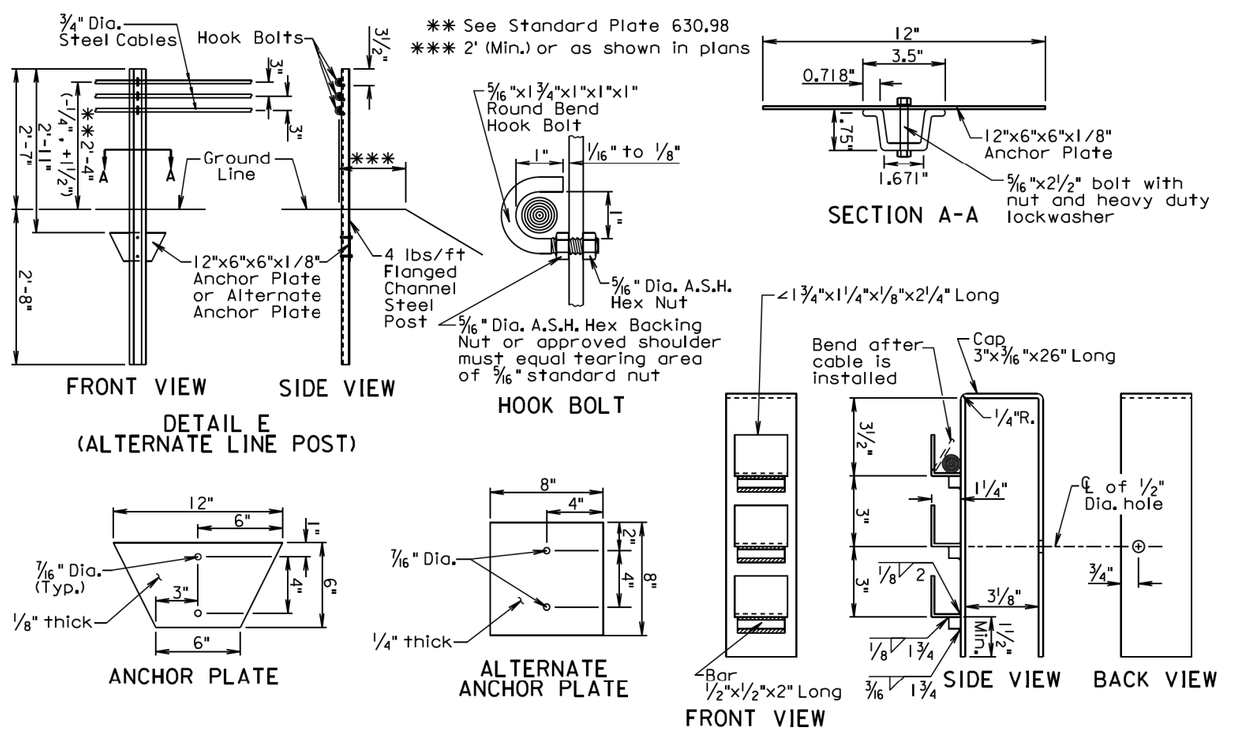

FLANGED CHANNEL STEEL POST FOR 3 CABLE GUARDRAIL

GENERAL NOTES:

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

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W BEAM TO 3 CABLE TRANSITION

PLATE NUMBER 629.05

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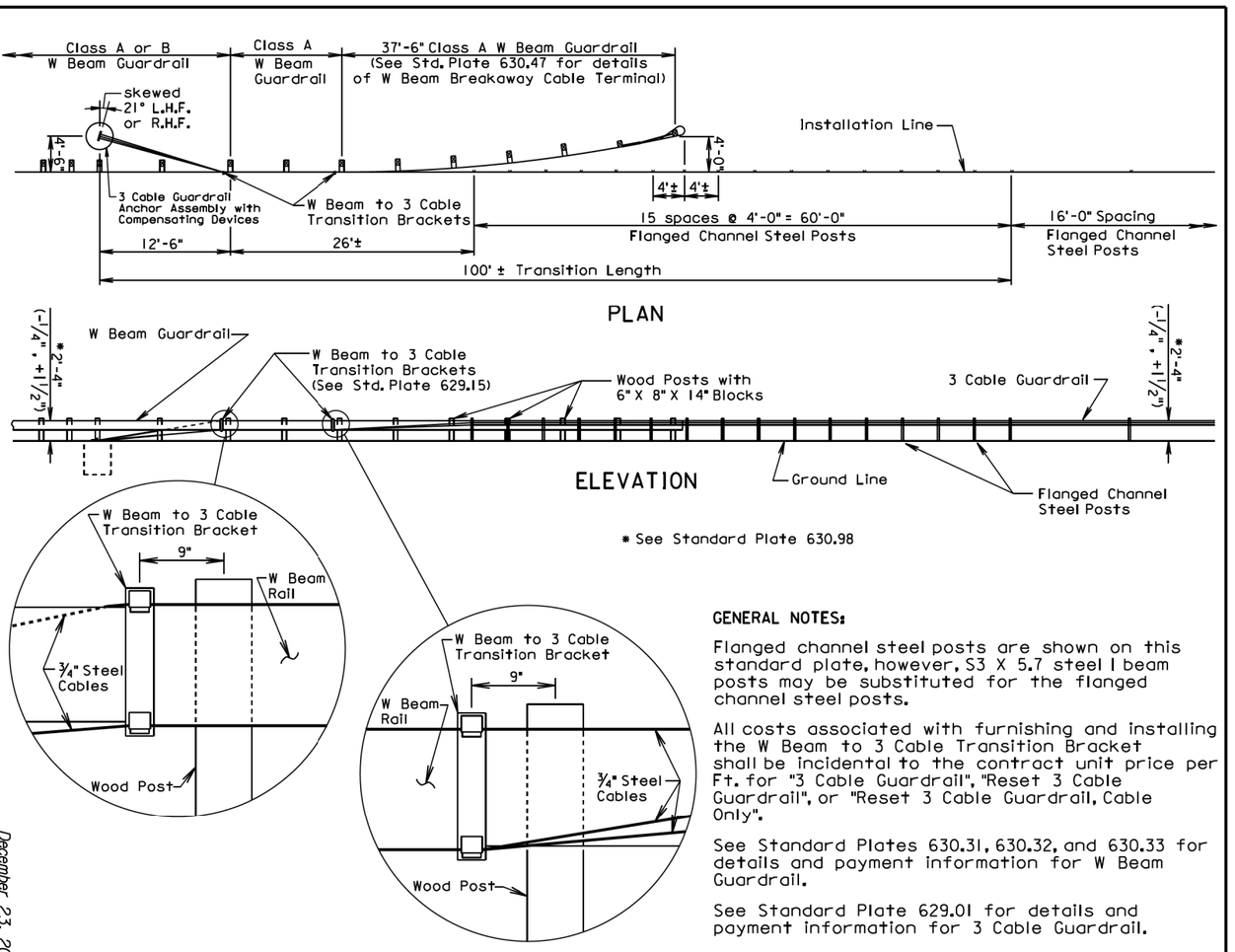
December 23, 2010



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.

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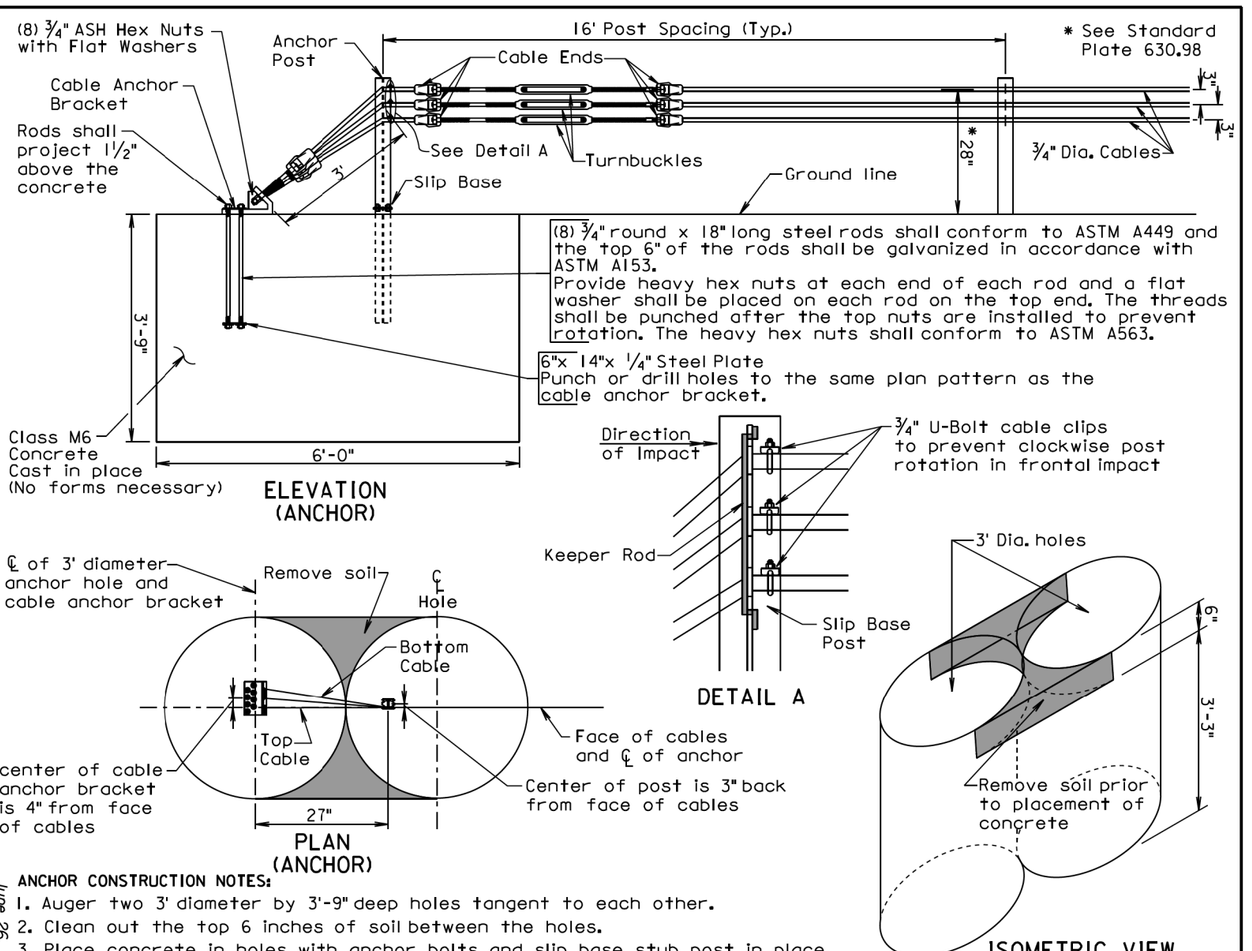
3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

PLATE NUMBER 629.10

Sheet 1 of 3

June 26, 2010



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 cu. yds.

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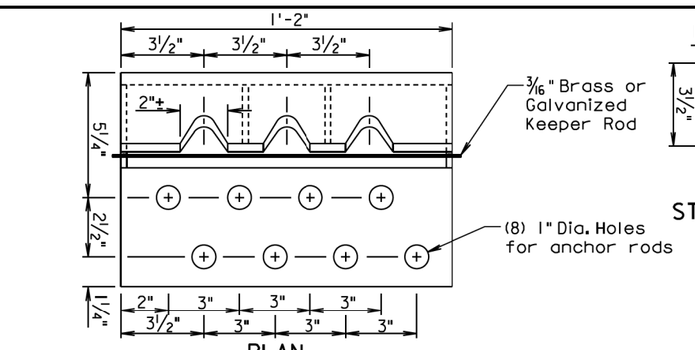
SDDOT

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

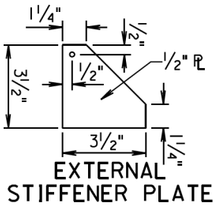
PLATE NUMBER 629.10

Sheet 2 of 3

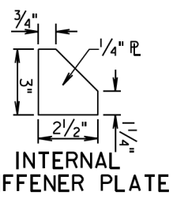
June 26, 2010



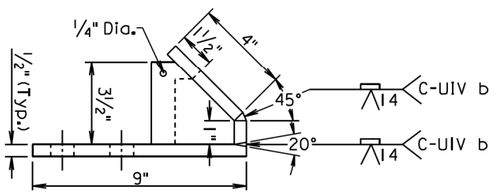
PLAN



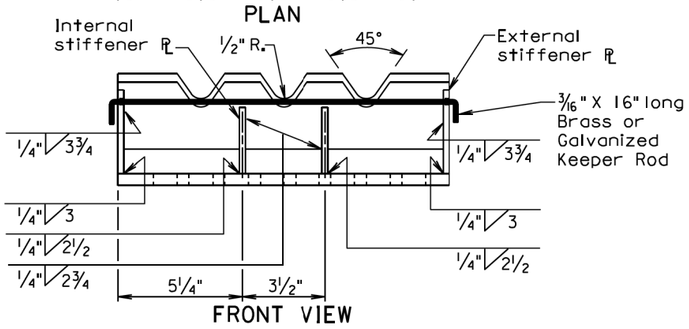
EXTERNAL STIFFENER PLATE



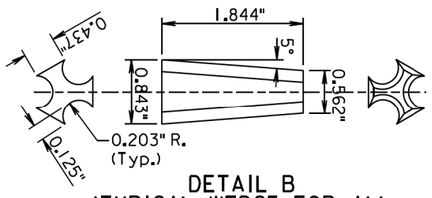
INTERNAL STIFFENER PLATE



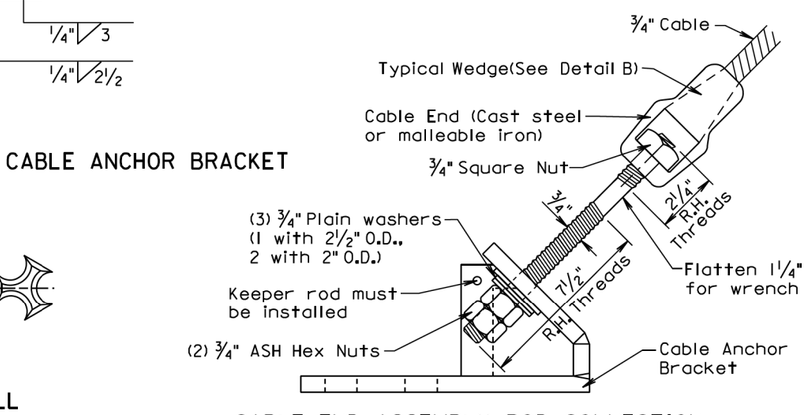
SIDE VIEW



FRONT VIEW



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



CABLE ANCHOR BRACKET

CABLE END ASSEMBLY ROD CONNECTION TO CABLE ANCHOR BRACKET

Published Date: 1st Qtr. 2014

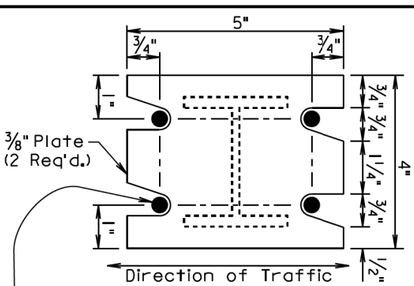
SDDOT

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

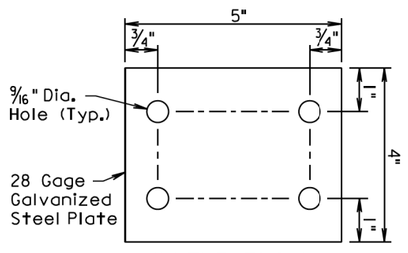
PLATE NUMBER 629.10

Sheet 3 of 3

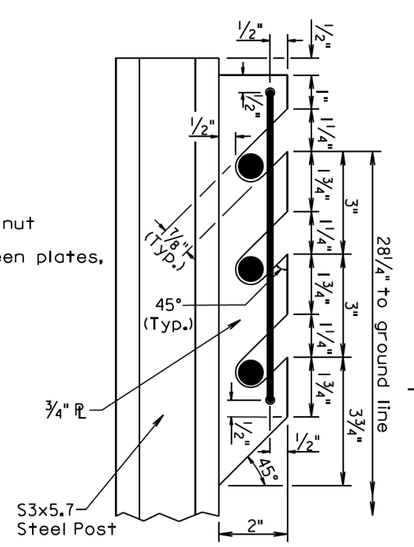
June 26, 2010



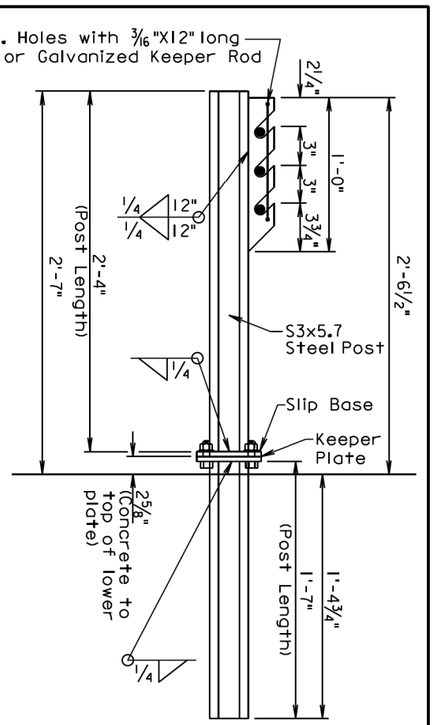
SLIP BASE (Keeper Plate not shown)



KEEPER PLATE



ANCHOR POST PLATE



ANCHOR POST

GENERAL NOTES:

Anchor post shall be a S3x5.7 rolled steel section. Post and plates shall conform to ASTM A36 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, U-bolt cable clips, 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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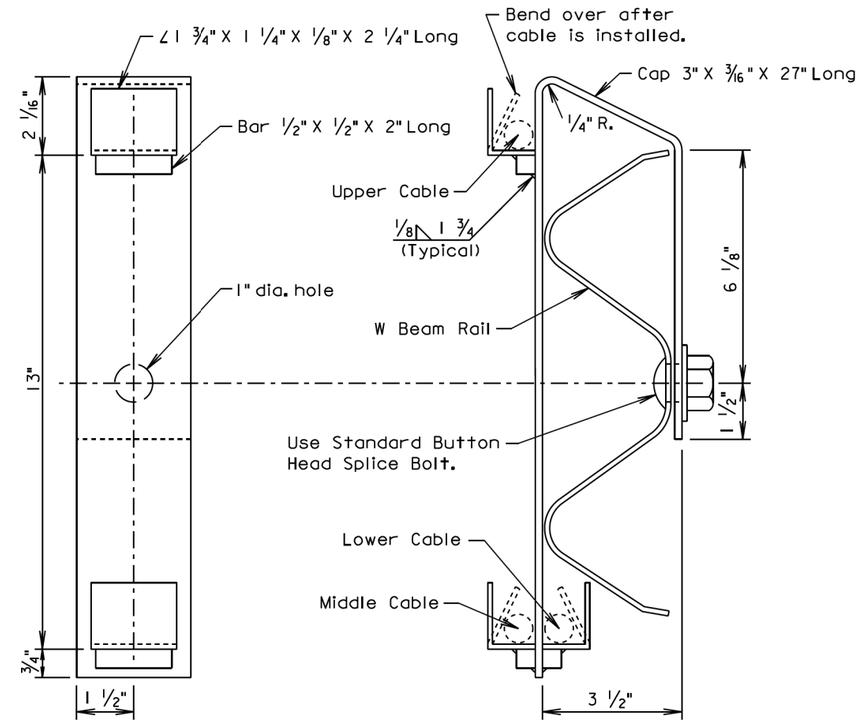

ELEVATION
(TRANSITION BRACKET)

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

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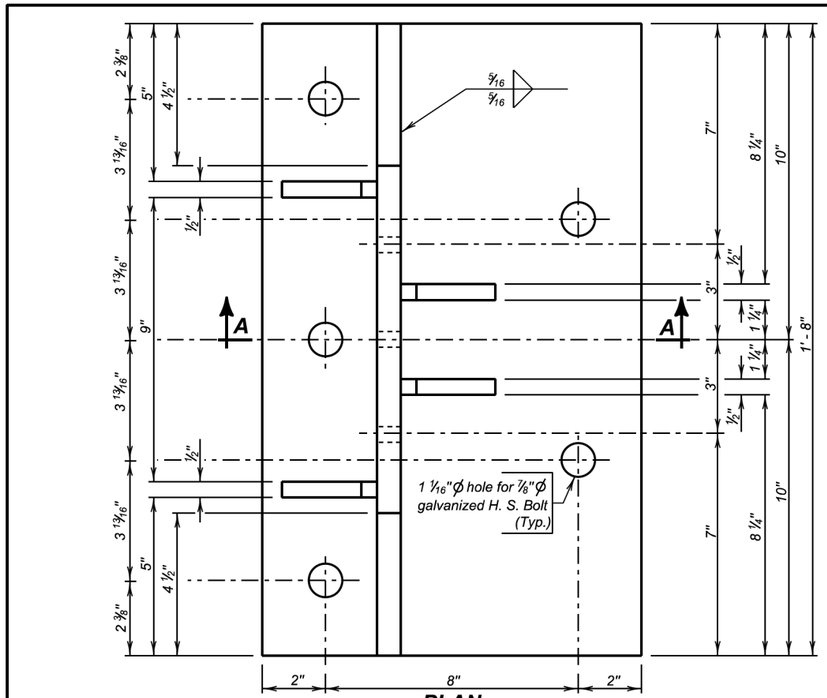
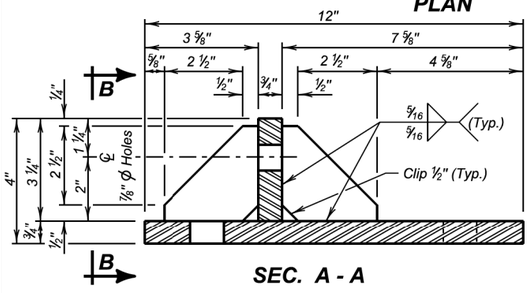


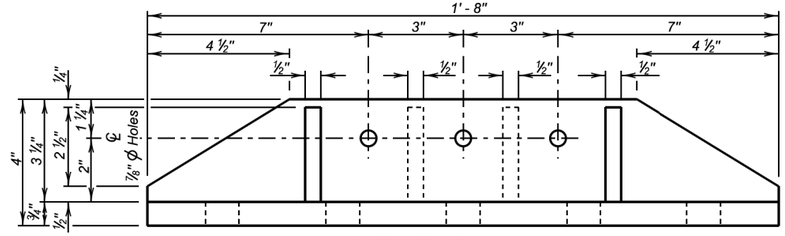
PLAN



SEC. A - A

GENERAL NOTES:

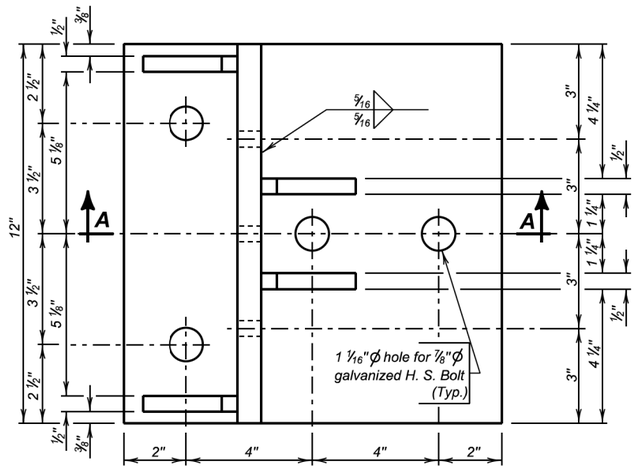
1. All steel shall conform to ASTM A709 Grade 36.
2. Welding and weld inspection shall be in conformance with AWS/ANSI D1.1 (Current Year) Structural Welding Code - Steel.
3. After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).
4. Bolts, nuts, and washers shall be provided with each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



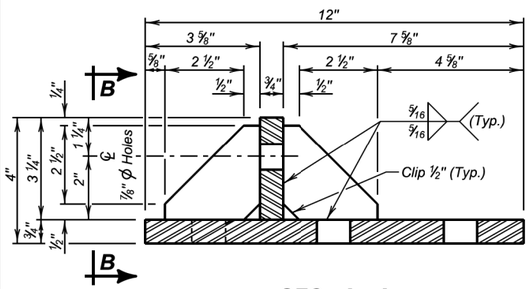
VIEW B - B

June 26, 2012

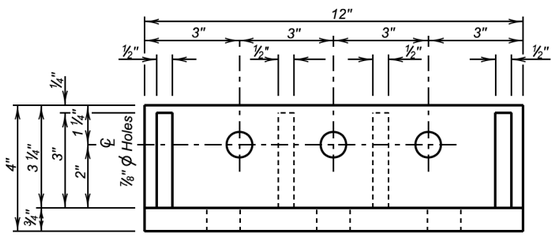
Published Date: 1st Qtr. 2014	SDDOT	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER 629.30
			Sheet 1 of 1



PLAN



SEC. A - A



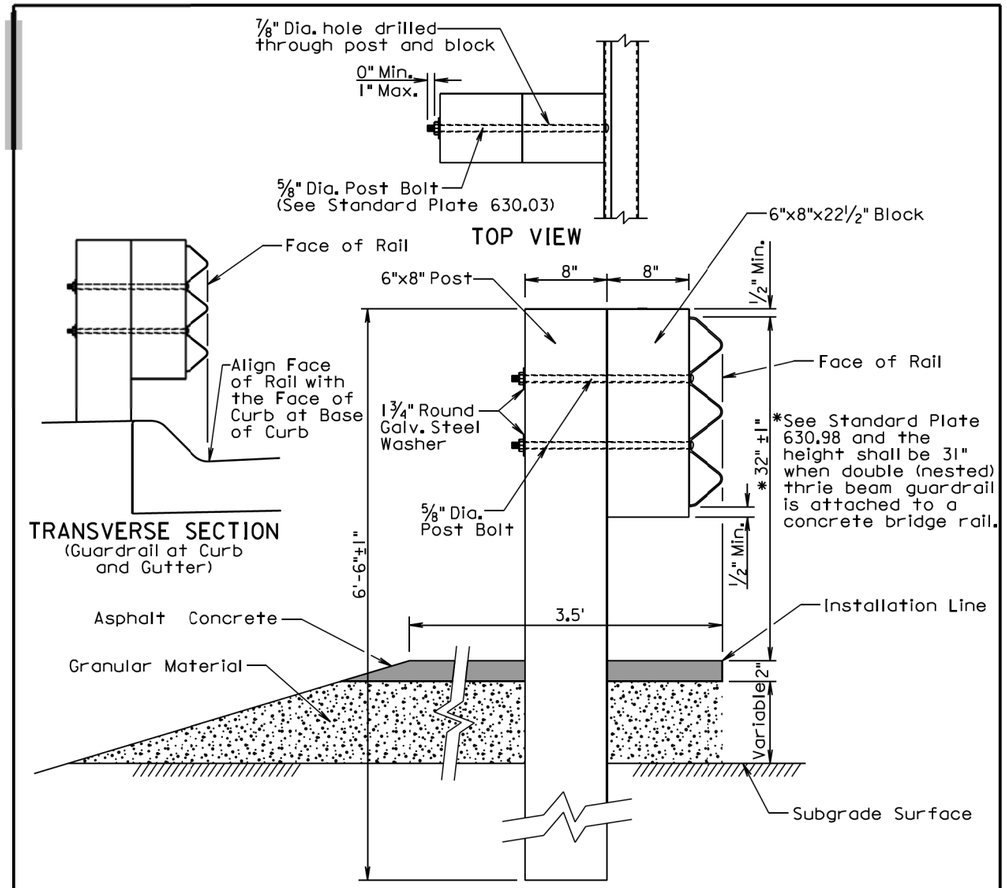
VIEW B - B

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 ⅞ inch diameter x 2 ½ 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. 2014	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 SD Standard Specifications for "Asphalt Concrete Composite." For informational purposes, the Rate of Materials for the 3.5' wide section of asphalt concrete as shown above shall be 4.80 Tons per Station.

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

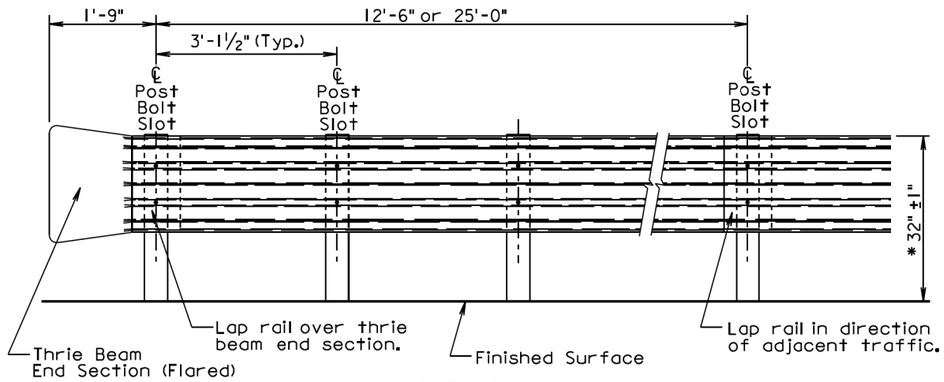
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "Thrie Beam Guardrail" bid item.

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

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

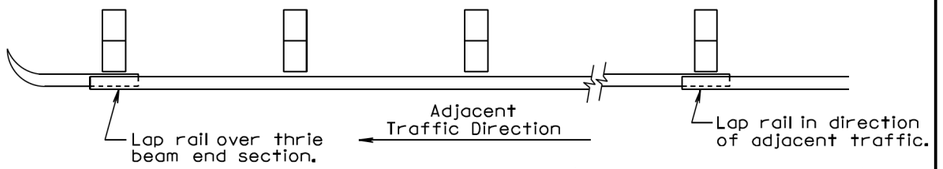
December 23, 2010

Published Date: 1st Qtr. 2014	SDDOT	**THRIE BEAM GUARDRAIL POST INSTALLATION**	PLATE NUMBER 630.01 Sheet 1 of 1



ELEVATION

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



PLAN

THRIE BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	2'-6"
3'-1½"	1'-9"

For Informational Purposes Only

GENERAL NOTES:

All thrie beam rail shall be Type 1.

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

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

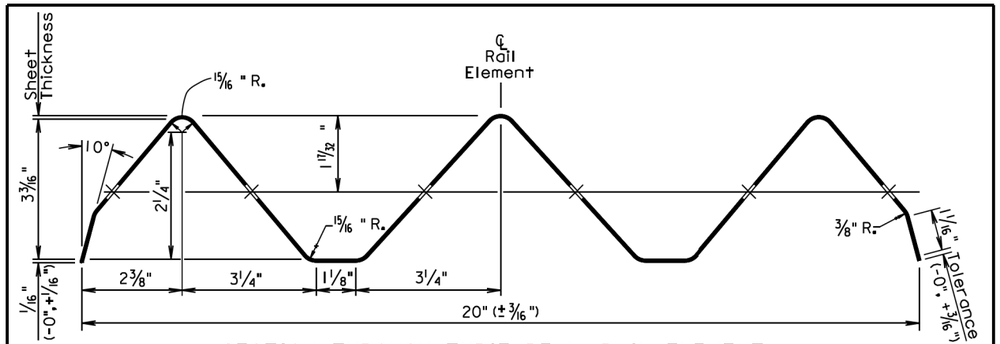
Thrie Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for Thrie Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

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

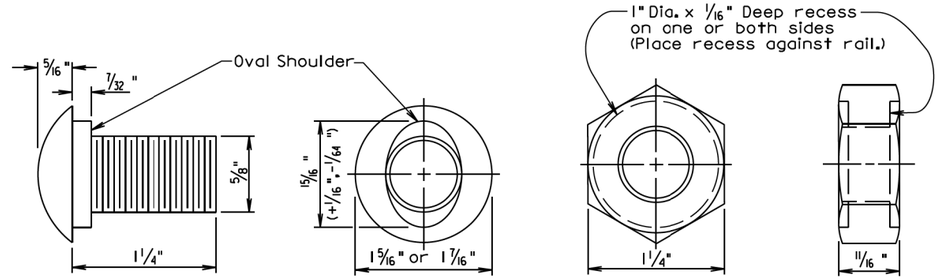
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "Thrie Beam Guardrail" bid item.

December 23, 2010

Published Date: 1st Qtr. 2014	SDDOT	THRIE BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.02
			Sheet 1 of 1

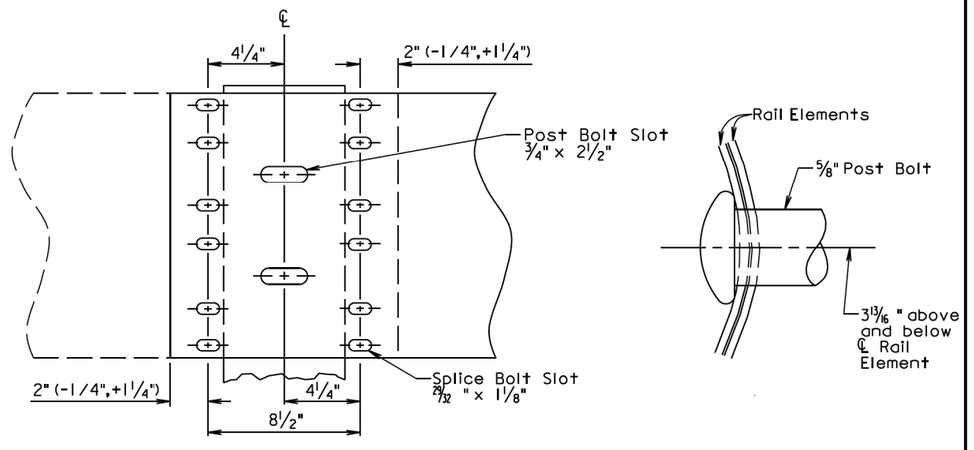


SECTION THROUGH THRIE BEAM RAIL ELEMENT



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

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

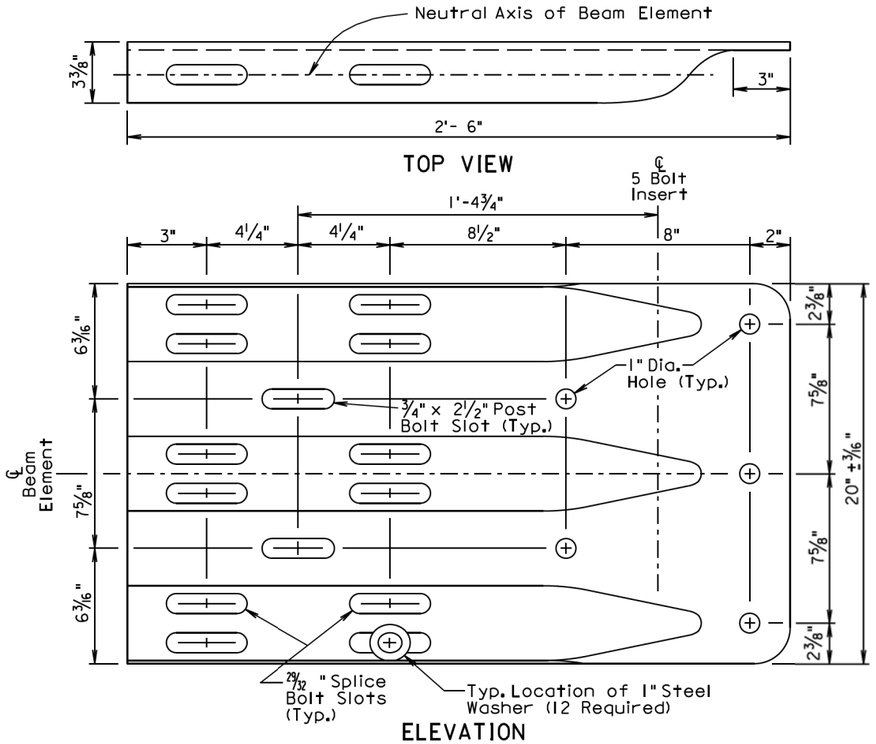


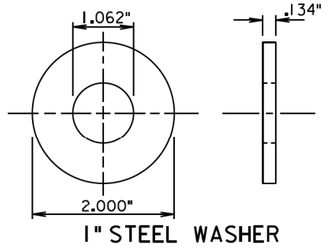
Lap in direction of traffic.

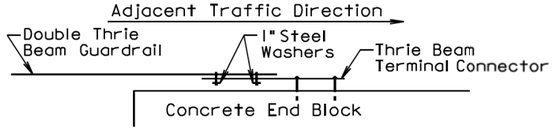
RAIL SPLICE

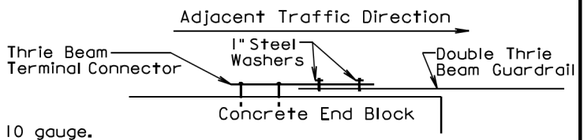
March 31, 2000

Published Date: 1st Qtr. 2014	SDDOT	THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.03
			Sheet 1 of 1









GENERAL NOTES:

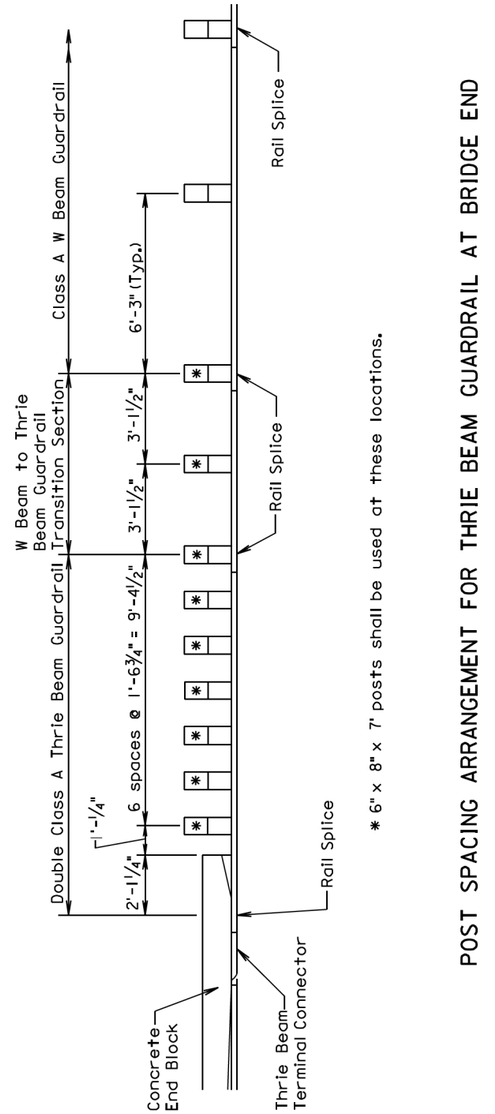
Thrie Beam Terminal Connectors shall be 10 gauge.

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

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

September 14, 2001

Published Date: 1st Qtr. 2014	SDDOT	**THRIE BEAM TERMINAL CONNECTOR AND 1 " STEEL WASHER**	PLATE NUMBER 630.05 Sheet 1 of 1



POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

Published Date: 1st Qtr. 2014	SDDOT	**POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END**	PLATE NUMBER 630.15 Sheet 1 of 1

Published Date: 1st Qtr. 2014

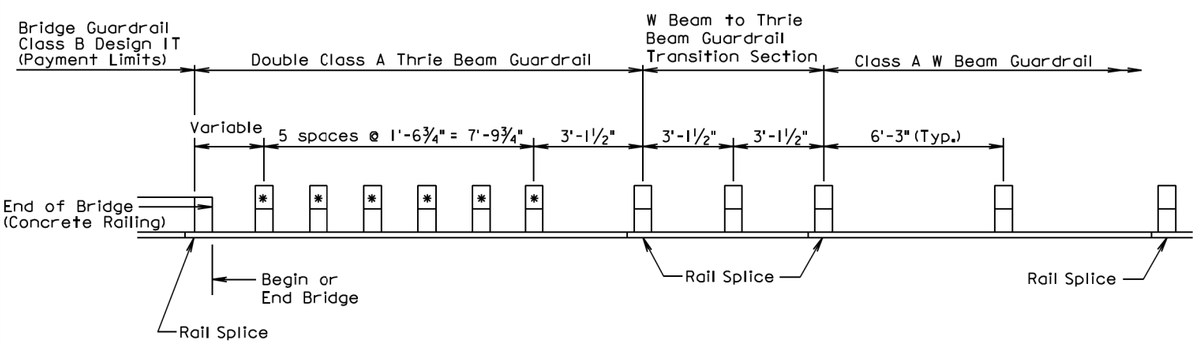
SDDOT

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END (BRIDGE GUARDRAIL DESIGN 1T)

PLATE NUMBER 630.20

Sheet 1 of 1

March 31, 2000



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

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

Published Date: 1st Qtr. 2014

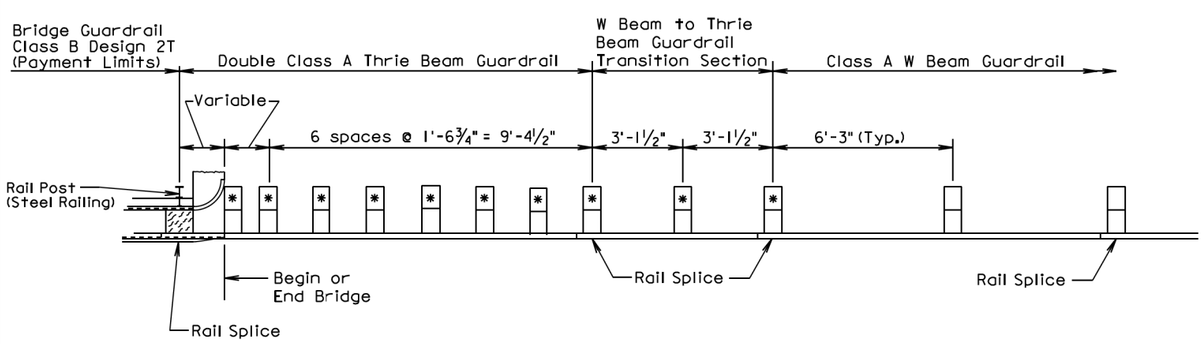
SDDOT

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END (BRIDGE GUARDRAIL DESIGN 2T)

PLATE NUMBER 630.21

Sheet 1 of 1

December 23, 2002



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

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

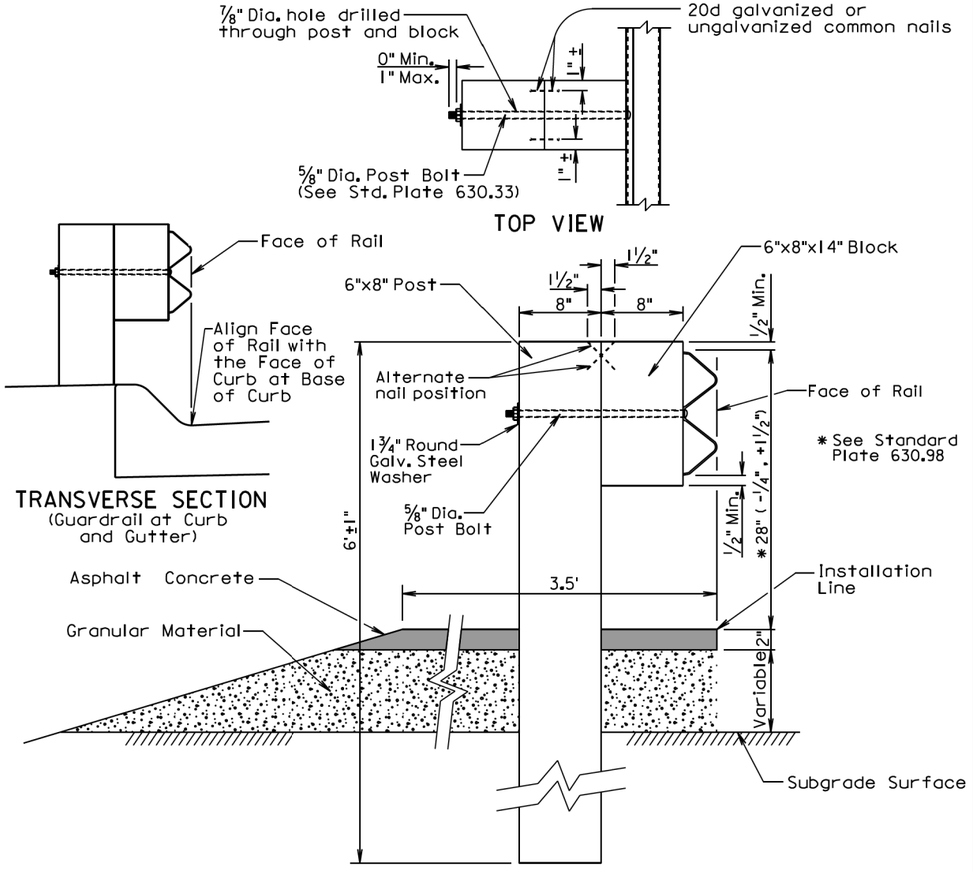
Plotting Date: 04/18/2014

STATE OF SOUTH DAKOTA

PROJECT 0001-391

SHEET 22

TOTAL SHEETS 35



TRANSVERSE SECTION

GENERAL NOTES:

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

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

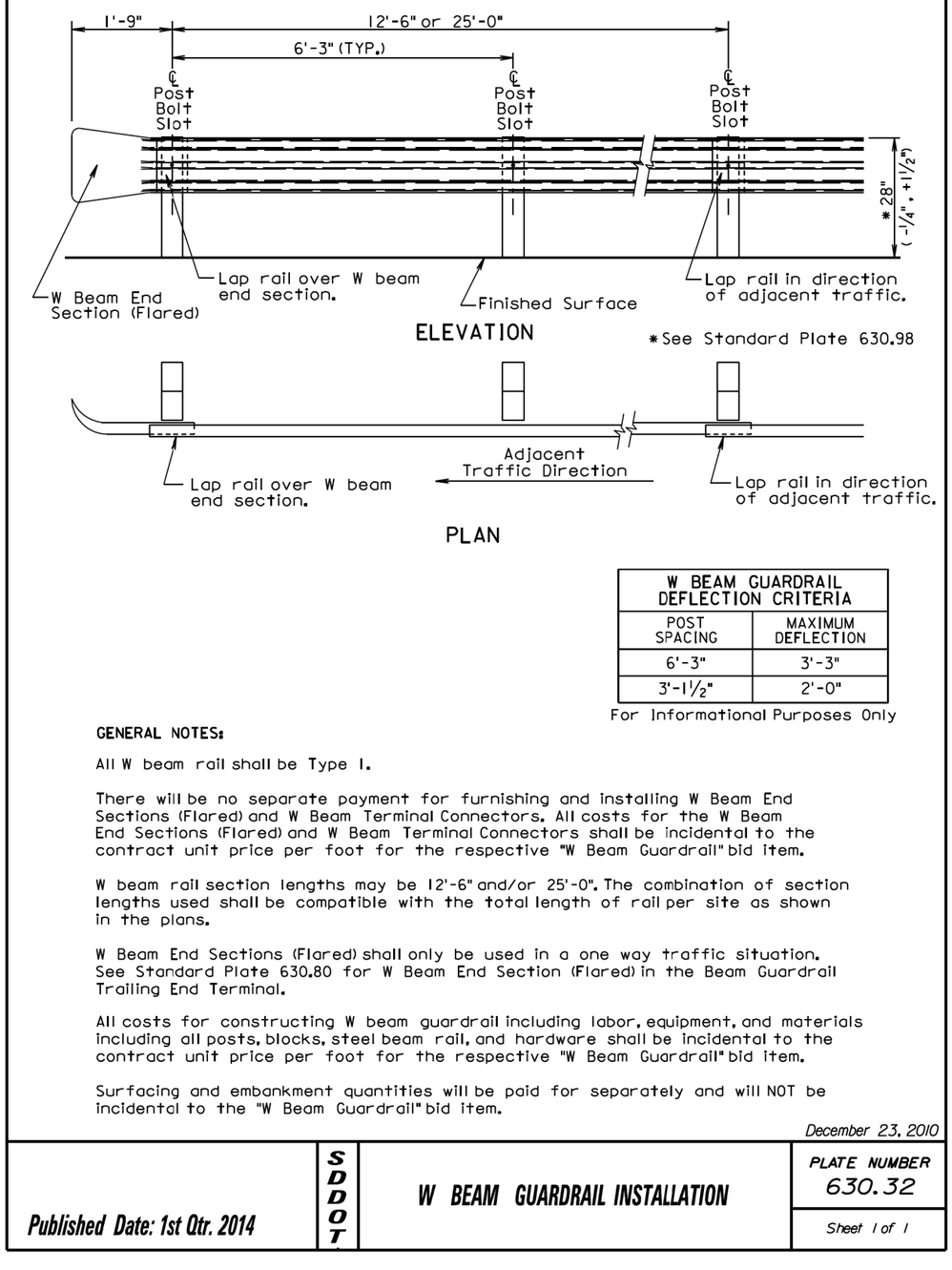
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

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

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

December 23, 2010

Published Date: 1st Qtr. 2014	SDDOT	W BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.31
			Sheet 1 of 1



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

For Informational Purposes Only

GENERAL NOTES:

All W beam rail shall be Type 1.

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

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

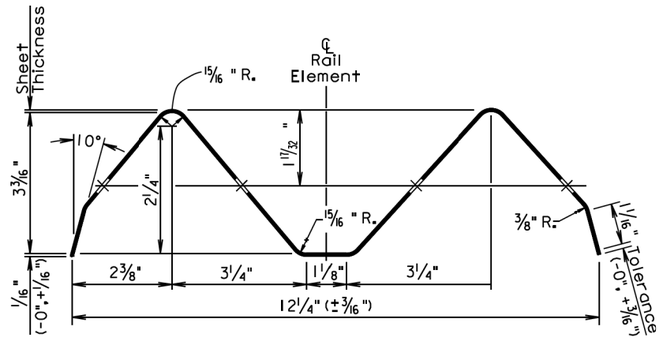
W Beam End Sections (Flared) shall only be used in a one way traffic situation. See Standard Plate 630.80 for W Beam End Section (Flared) in the Beam Guardrail Trailing End Terminal.

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

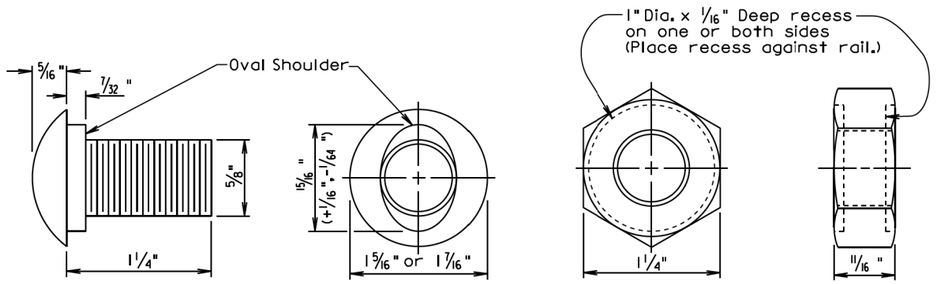
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

December 23, 2010

Published Date: 1st Qtr. 2014	SDDOT	W BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.32
			Sheet 1 of 1

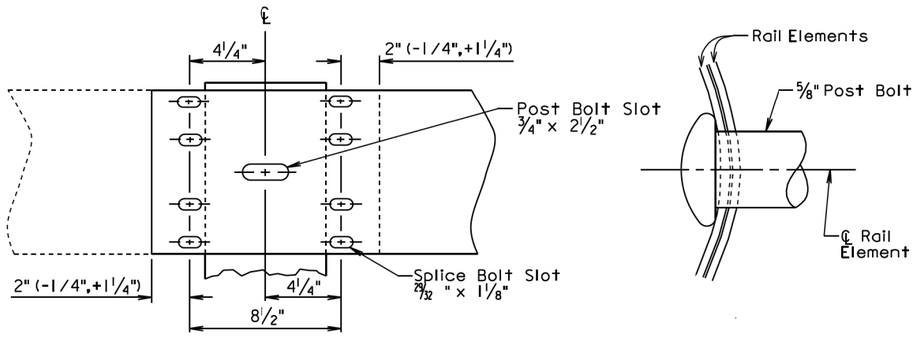


SECTION THROUGH W BEAM RAIL ELEMENT



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

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

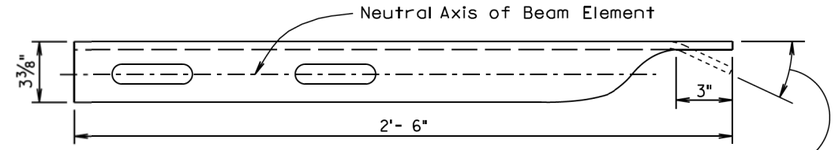


Lap in direction of traffic.

RAIL SPLICE

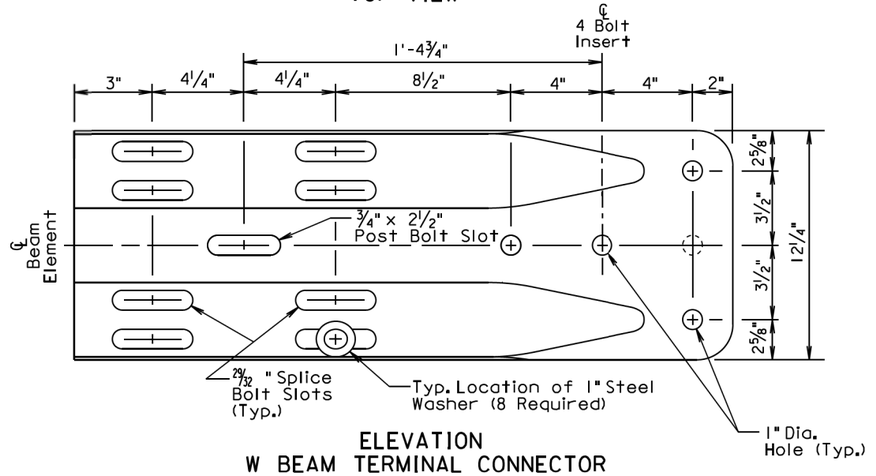
December 23, 2004

Published Date: 1st Qtr. 2014	SDDOT	W BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER 630.33
			Sheet 1 of 1

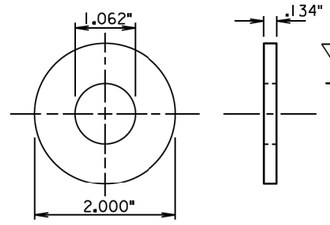


An extra hole and an approximate 26° bend shall be required only for the Breakaway Cable Terminal. The Modified W Beam Terminal Connector placement detail is shown on Standard Plate 630.47.

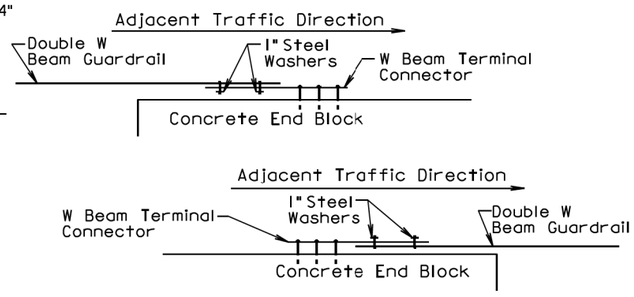
TOP VIEW



ELEVATION
W BEAM TERMINAL CONNECTOR



1" STEEL WASHER



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, 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.

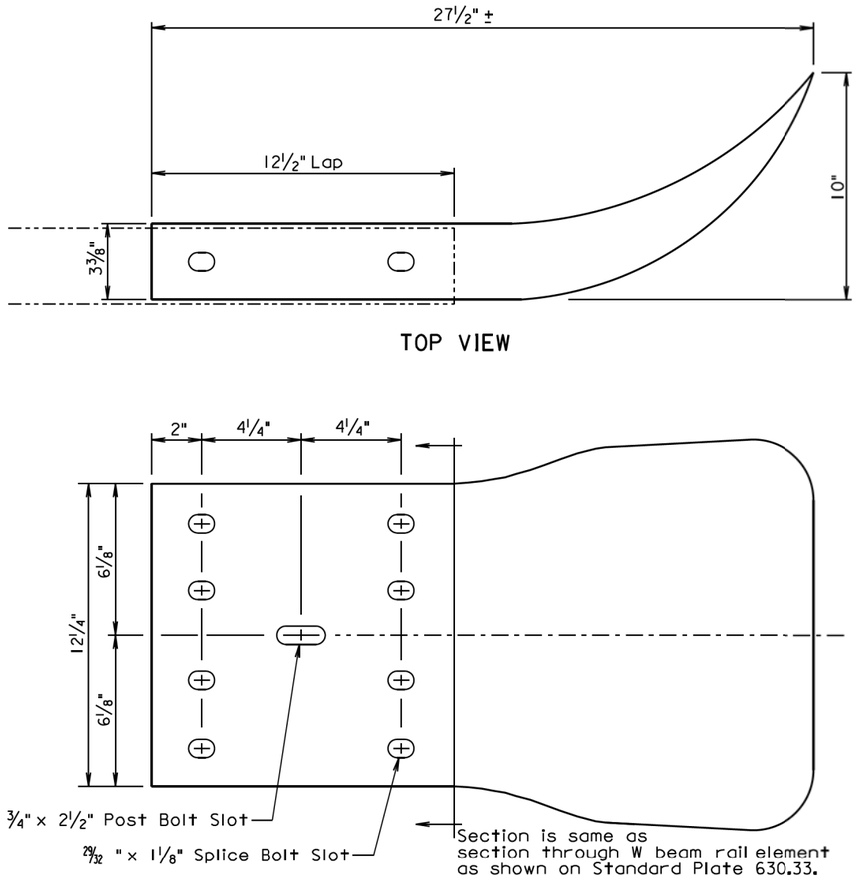
There will be no separate payment for furnishing and installing the W Beam Terminal Connector. All costs for the W Beam Terminal Connector shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

September 14, 2001

Published Date: 1st Qtr. 2014	SDDOT	W BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER	PLATE NUMBER 630.35
			Sheet 1 of 1

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	25	35

Plotting Date: 04/18/2014



GENERAL NOTES:

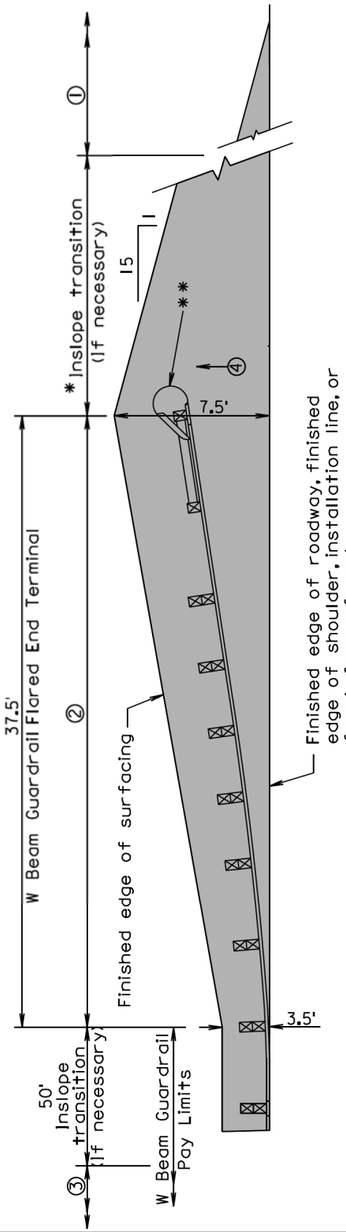
W Beam End Sections (Flared) shall be 12 gage.

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

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

March 31, 2000

Published Date: 1st Qtr. 2014	SDDOT	W BEAM END SECTION (FLARED)	PLATE NUMBER 630.40
			Sheet 1 of 1



PLAN

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

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

GENERAL NOTES:

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

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

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

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

September 6, 2009

Published Date: 1st Qtr. 2014	SDDOT	EMBANKMENT AND SURFACING FOR W BEAM GUARDRAIL FLARED END TERMINAL	PLATE NUMBER 630.45
			Sheet 1 of 1

Published Date: 1st Qtr. 2014

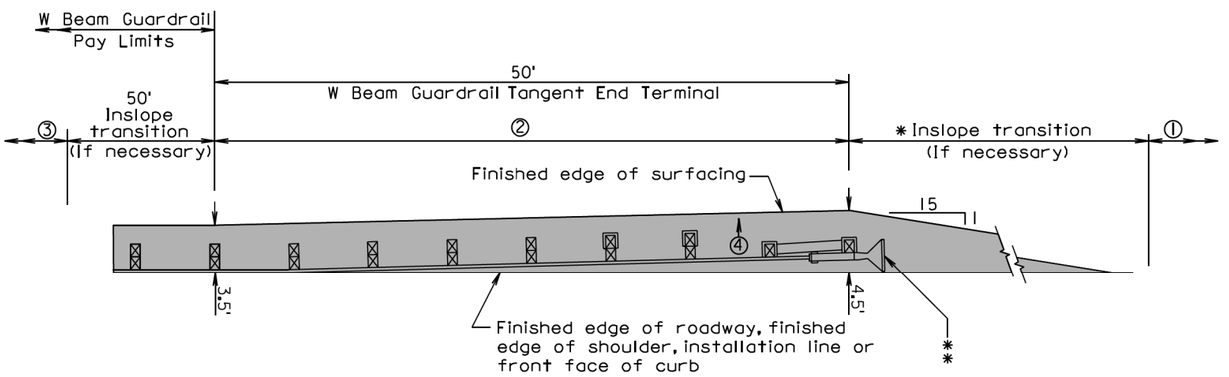
SDDOT

EMBANKMENT AND SURFACING FOR W BEAM GUARDRAIL TANGENT END TERMINAL

PLATE NUMBER 630.46

Sheet 1 of 1

September 6, 2009



PLAN

2" Asphalt concrete surfacing with variable thickness granular material

① Same inslope as mainline inslope

② 4:1 inslope

③ 2:1 inslope or flatter, or inslope as specified in plans

④ Same slope as roadway cross slope

* 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'.

GENERAL NOTES:

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

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

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

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

Published Date: 1st Qtr. 2014

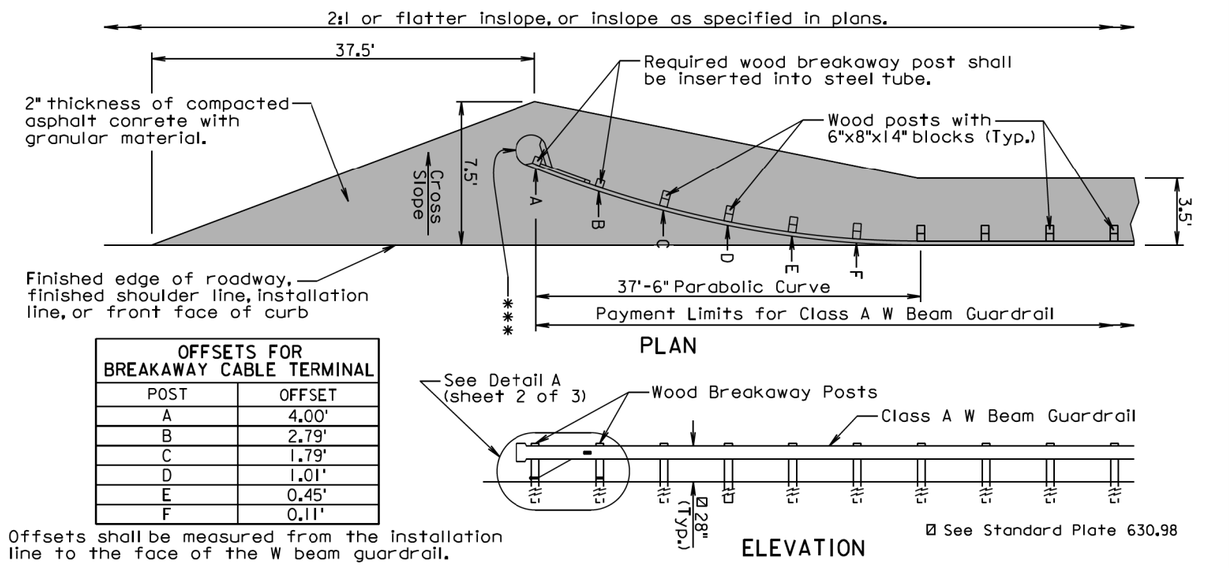
SDDOT

W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL

PLATE NUMBER 630.47

Sheet 1 of 3

June 26, 2010



PLAN

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.

ELEVATION

Ø See Standard Plate 630.98

GENERAL NOTES:

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

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

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

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

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

STATE OF SOUTH DAKOTA

Plotting Date: 04/18/2014

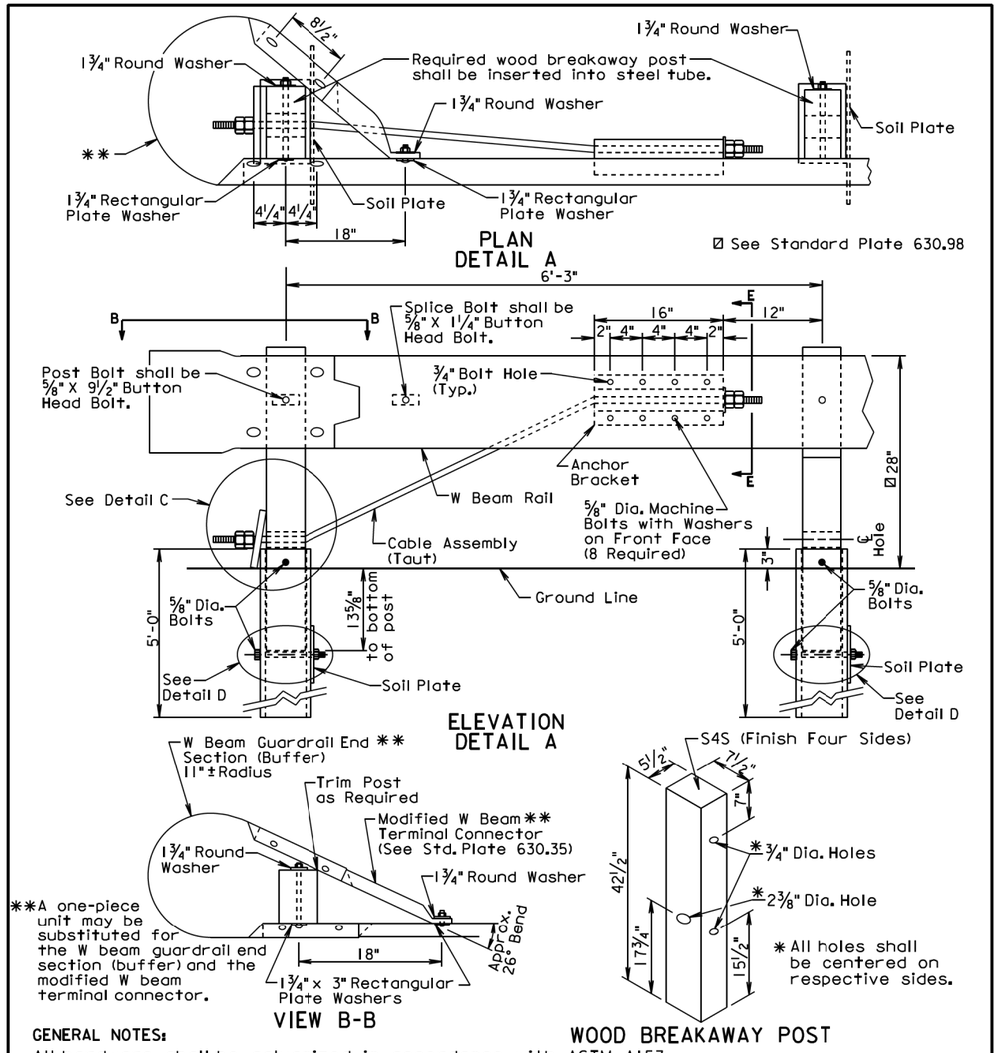
PROJECT 0001-391

SHEET 26

TOTAL SHEETS 35

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	27	35

Plotting Date: 04/18/2014



GENERAL NOTES:

All hardware shall be galvanized in accordance with ASTM A153.

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

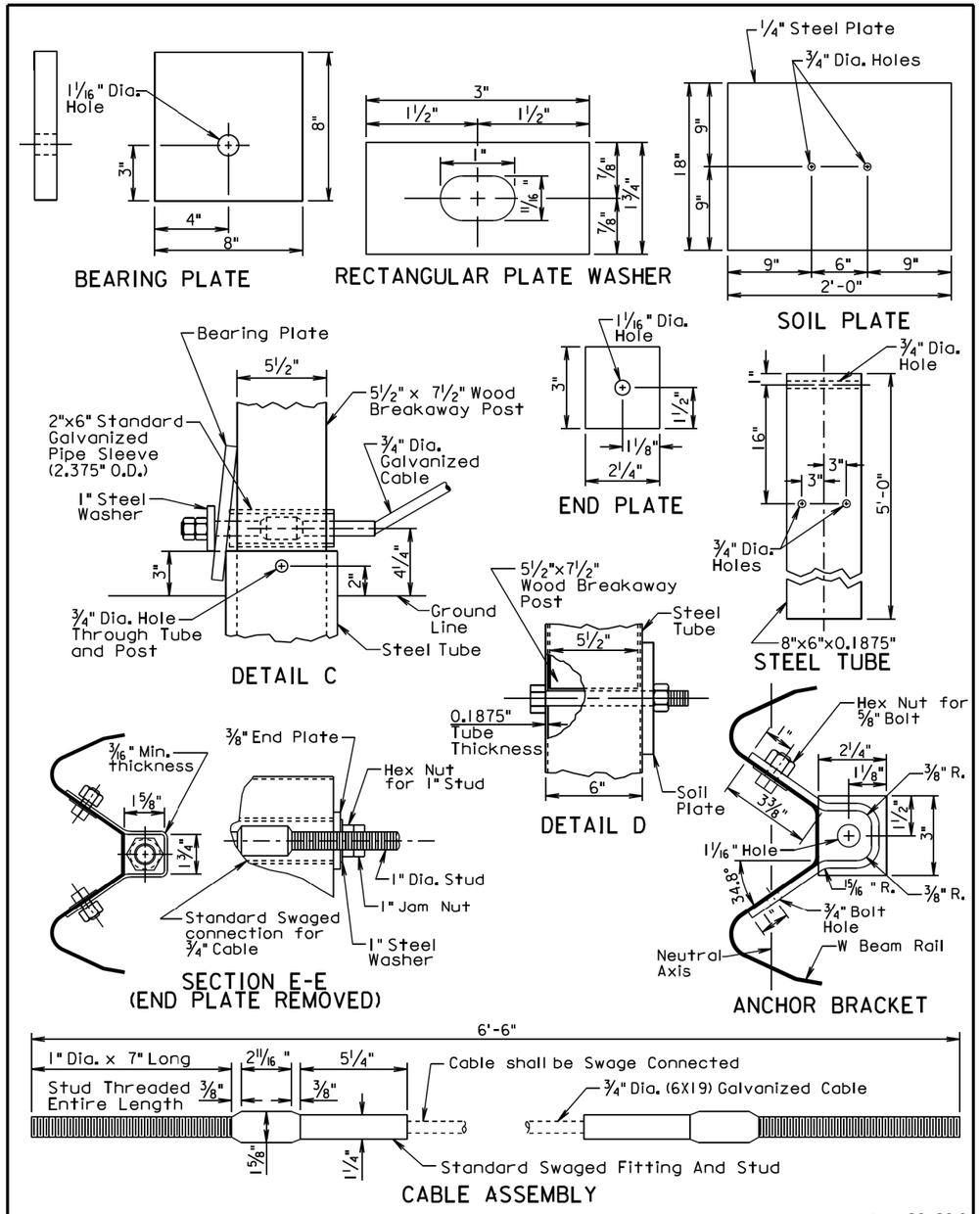
The anchor bracket, soil plate, and bearing plate shall be fabricated from steel that meets ASTM A36 Specifications. They shall be galvanized after fabrication in accordance with ASTM A123.

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

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

June 26, 2010

Published Date: 1st Qtr. 2014	SDDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.47 Sheet 2 of 3



June 26, 2010

Published Date: 1st Qtr. 2014	SDDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.47 Sheet 3 of 3

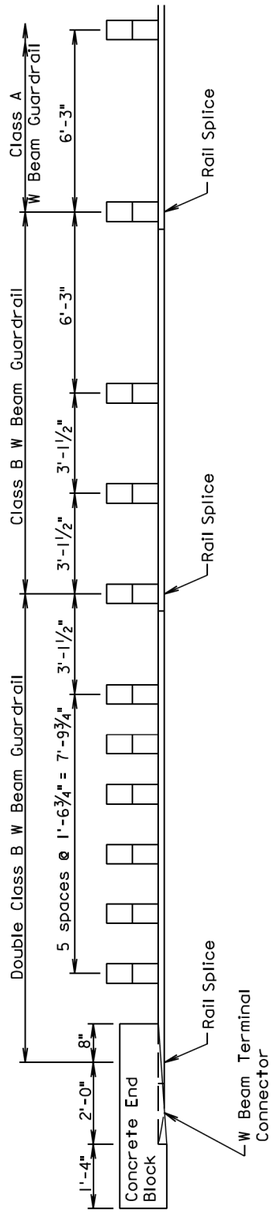
- Plotted From - Invi1nf23 Plot Scale - 1:200

File - ...\S630_47_02_03.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	28	35

Plotting Date: 04/18/2014

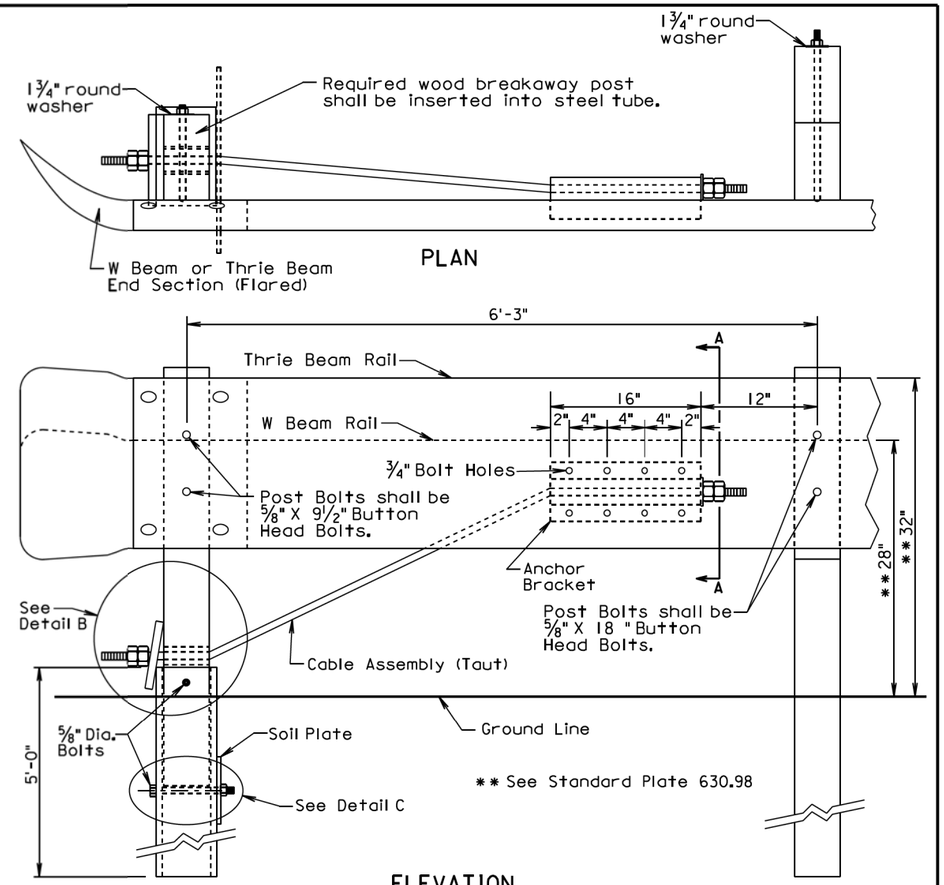
Plot Scale - 1:200



POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END

March 31, 2000

Published Date: 1st Qtr. 2014	SDDOT	POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END	PLATE NUMBER 630.50
			Sheet 1 of 1



GENERAL NOTES:

All hardware shall be galvanized in accordance with ASTM A153.

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.

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.

Costs for constructing the beam guardrail trailing end terminal and furnishing the anchor bracket, cable assembly, steel tube, soil plate, bearing plate, pipe sleeve, wood breakaway post, and all hardware necessary to attach anchor bracket, cable assembly, steel tube, soil plate, bearing plate, pipe sleeve, and wood breakaway post shall be incidental to the contract unit price per each for "Beam Guardrail Trailing End Terminal".

Costs for the thrie beam or W beam guardrail and the thrie beam or W beam end sections (Flared) shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" or "W Beam Guardrail" bid items.

June 26, 2010

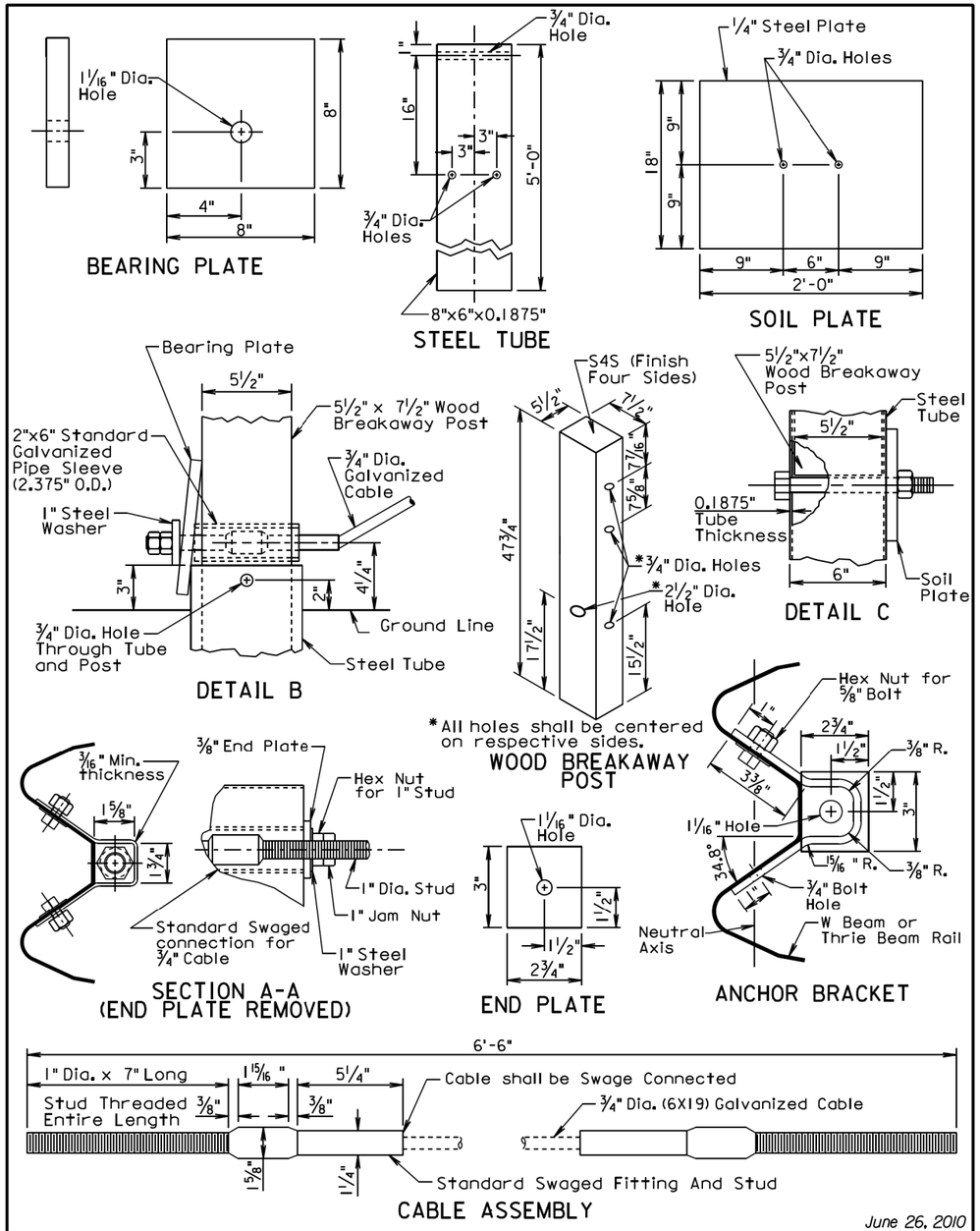
Published Date: 1st Qtr. 2014	SDDOT	BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 1 of 2

- Plotted From - tnvi1nl23

File - ...\S630_50_630_80_01.dgn

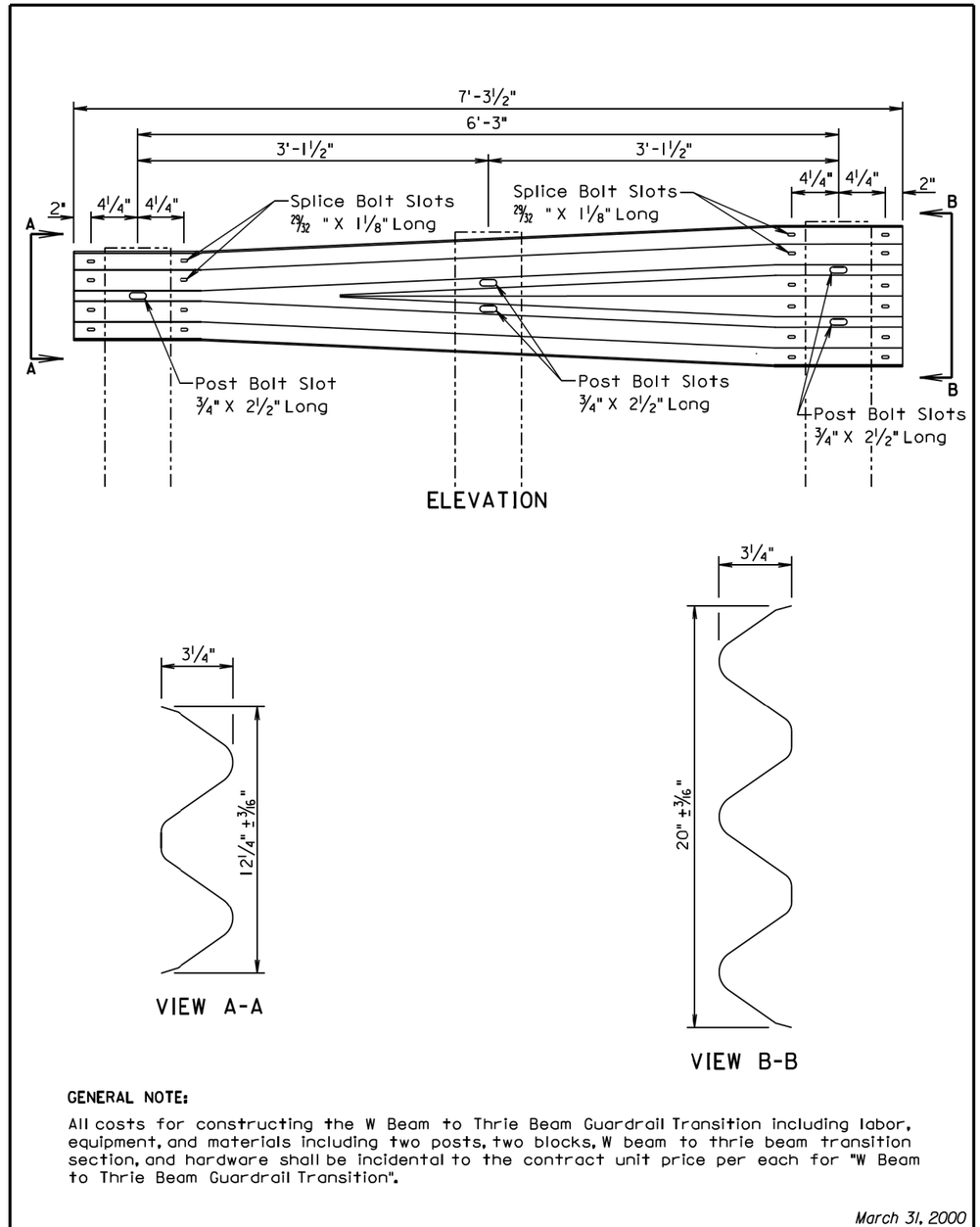
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	29	35

Plotting Date: 04/18/2014



June 26, 2010

Published Date: 1st Qtr. 2014	SDDOT	BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 2 of 2



GENERAL NOTE:

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

March 31, 2000

Published Date: 1st Qtr. 2014	SDDOT	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.82
			Sheet 1 of 1

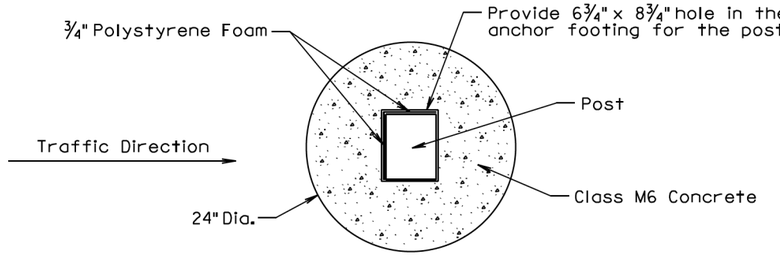
Plot Scale - 1:200

- Plotted From - Invi1n123

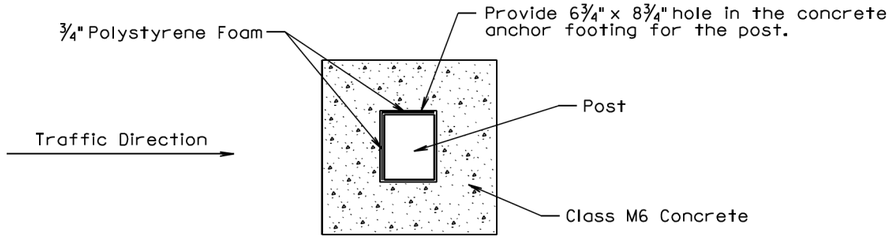
File - ...\S630_80_02_630_82.dgn

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-391	30	35

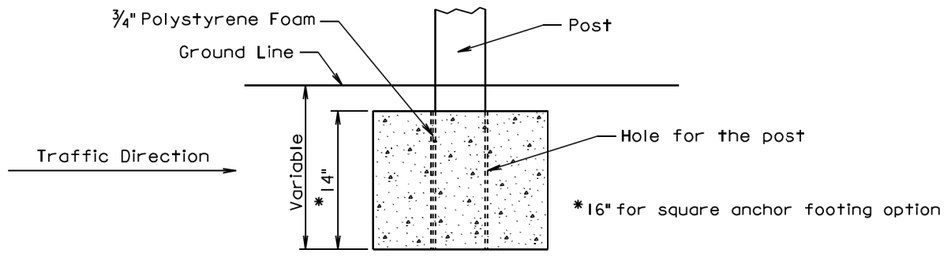
Plotting Date: 03/09/2015



PLAN
(PREFERRED 24" DIA. ROUND
CONCRETE ANCHOR FOOTING)



PLAN
(20" x 20" SQUARE
CONCRETE ANCHOR FOOTING)



ELEVATION

GENERAL NOTES:

In areas where the required guardrail wood post depth is not obtainable, shorter posts may be used and shall be anchored in concrete in accordance with the details shown on this standard plate.

A 20" x 20" square concrete anchor footing may be used in lieu of the 24" diameter round anchor footing.

Forms for the concrete anchor footing hole is not required.

Concrete for the concrete anchor footing shall be Class M6.

Three quarter inch polystyrene foam shall be attached to two sides of the posts. See details above for placement position of the polystyrene foam.

There will be no separate payment for furnishing and installing the concrete anchor footing for short guardrail post. All costs for concrete anchor footings shall be incidental to the contract unit price per foot for the respective "Thrie Beam or W Beam Guardrail" bid item.

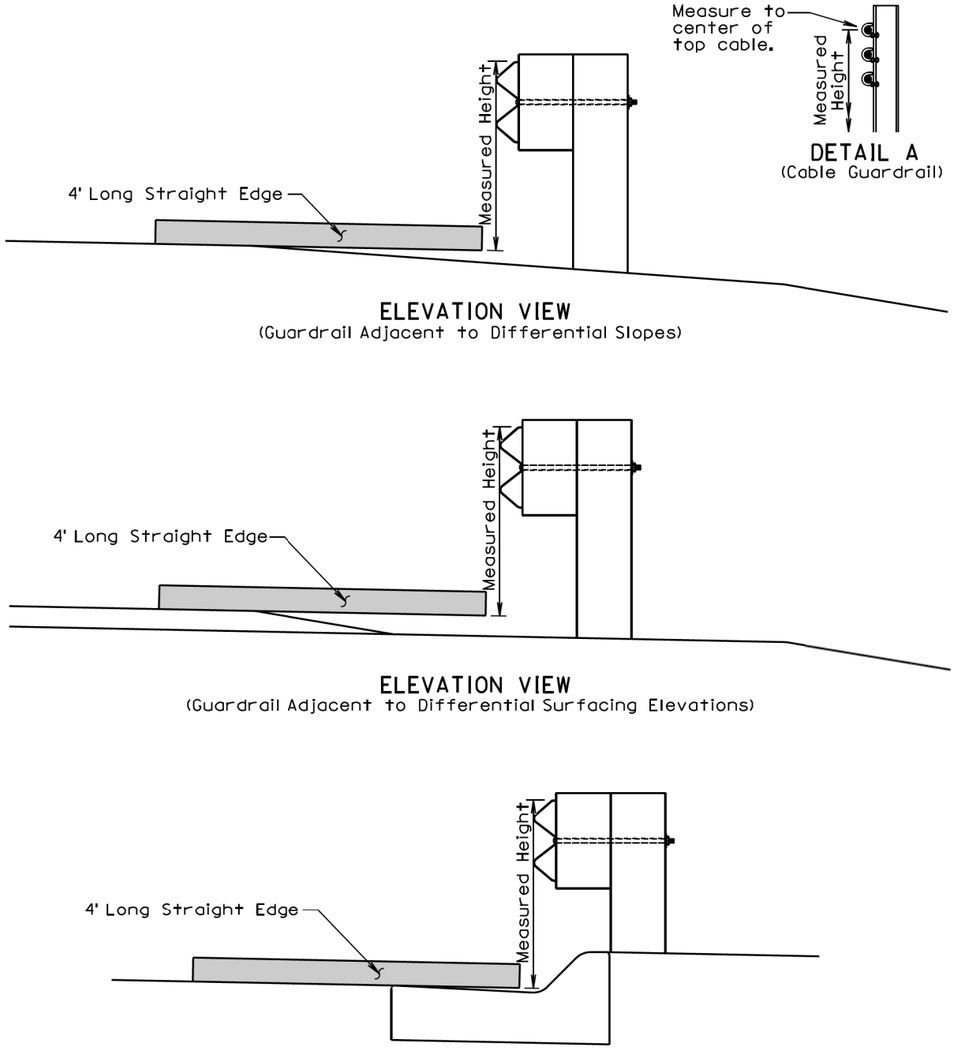
March 31, 2000

Published Date: 1st Qtr. 2015	SDDOT	***CONCRETE ANCHOR FOOTING FOR SHORT GUARDRAIL POST***	***PLATE NUMBER 630.84*** *Sheet 1 of 1*

Plot Scale - 1:200

- Plotted From - tnvi1n23

File - ...\Standard Plates\S630_84.dgn



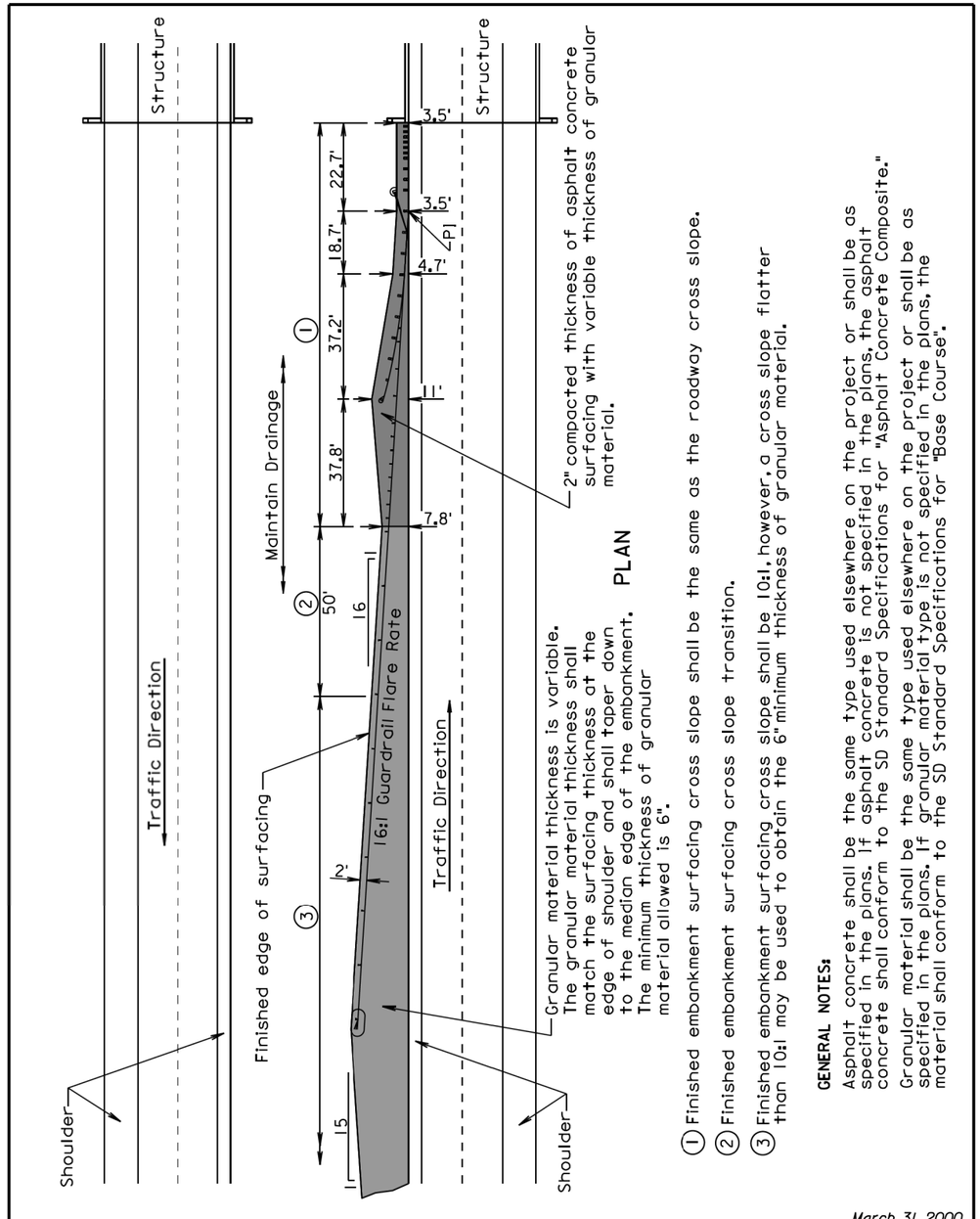
GENERAL NOTES:

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

When measuring height of cable guardrail or cable barrier the height shall be measured to the center of the top cable. See Detail A.

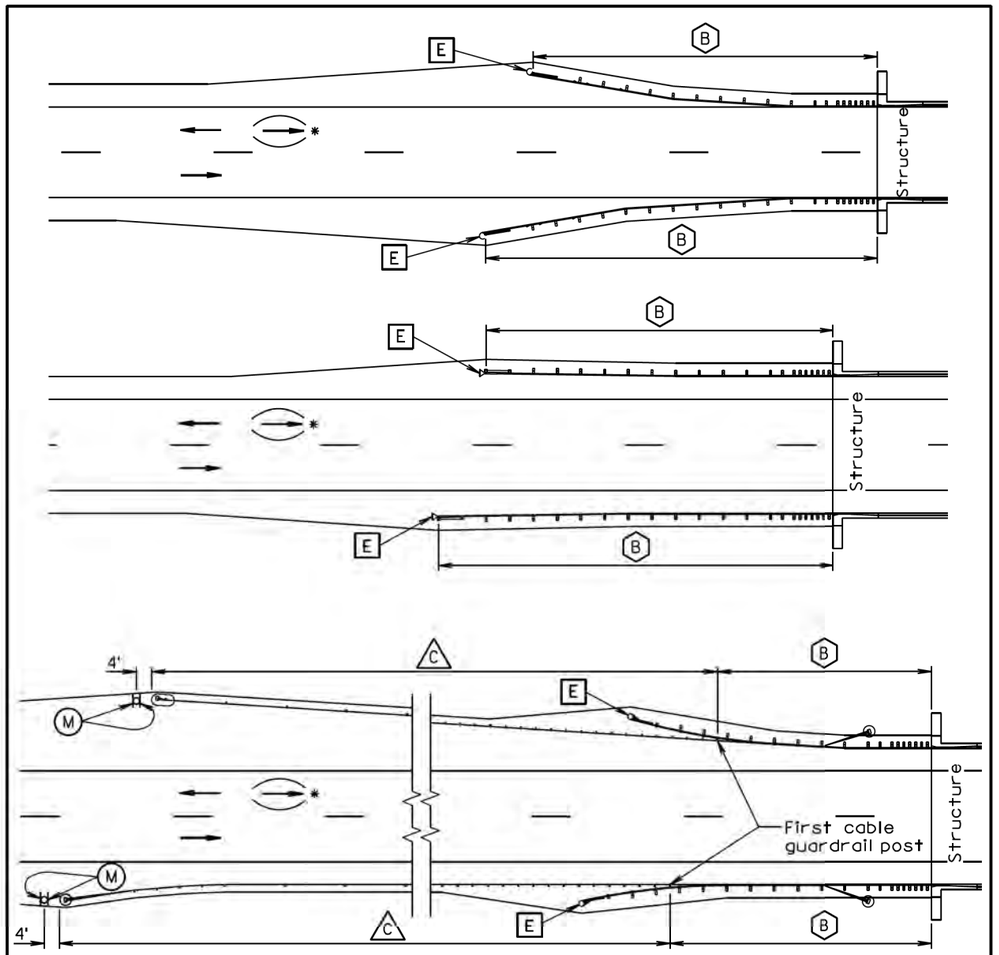
June 26, 2010

Published Date: 1st Qtr. 2014	SDDOT	**MEASURING GUARDRAIL HEIGHT**	*PLATE NUMBER* 630.98 *Sheet 1 of 1*



March 31, 2000

Published Date: 1st Qtr. 2014	SDDOT	**EMBANKMENT AND SURFACING FOR TYPICAL MEDIAN PROTECTION**	*PLATE NUMBER* 630.99 *Sheet 1 of 1*



TYPICAL GUARDRAIL LAYOUTS

(B) Steel Beam Guardrail Delineation

[E] Guardrail Terminal End Object Marker

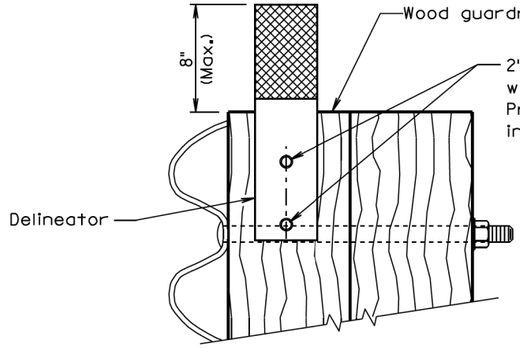
(C) 3 Cable Guardrail Delineation

(M) Type 2 Object Marker

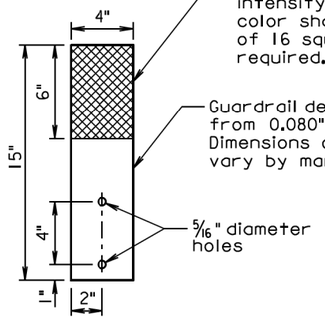
* For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 26, 2011

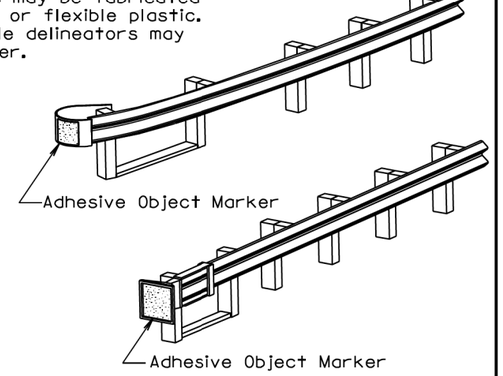
Published Date: 1st Qtr. 2014	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 1 of 4



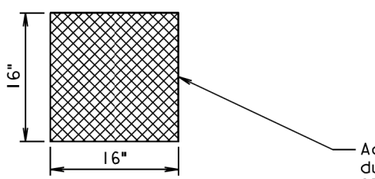
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



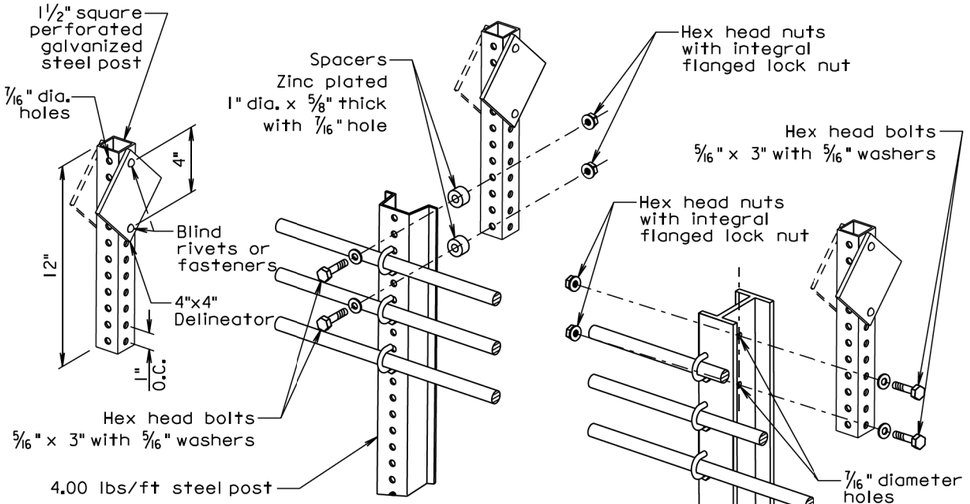
[E] GUARDRAIL TERMINAL END OBJECT MARKER



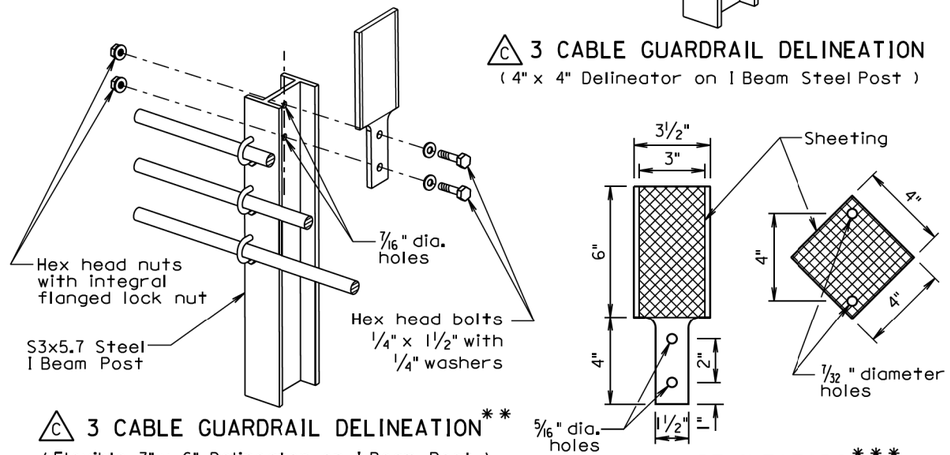
ADHESIVE OBJECT MARKER

June 26, 2011

Published Date: 1st Qtr. 2014	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 2 of 4



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



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

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

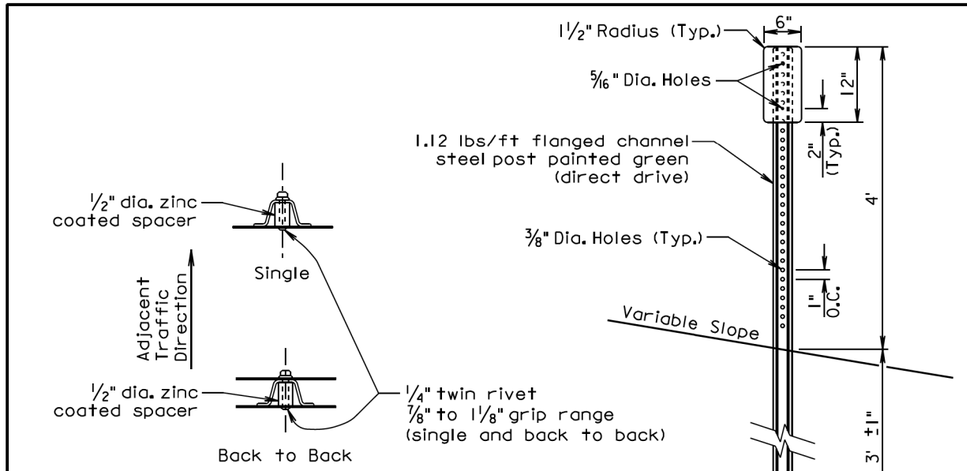
DELINEATORS***
(For 3 Cable Guardrail)

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

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

June 26, 2011

Published Date: 1st Qtr. 2014	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 3 of 4



TYPE 2 OBJECT MARKER DETAILS AND POST ORIENTATION

M TYPE 2 OBJECT MARKER
(For Marking 3 Cable Guardrail Anchor)

GENERAL NOTES:

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

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

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

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

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

June 26, 2011

Published Date: 1st Qtr. 2014	SDDOT	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 4 of 4

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	34	35

Plotting Date: 04/18/2014

◎ Reflectorized Drum

■ Channelizing Device shall be be 42" cones or drums

▭ Movable Concrete Barrier

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

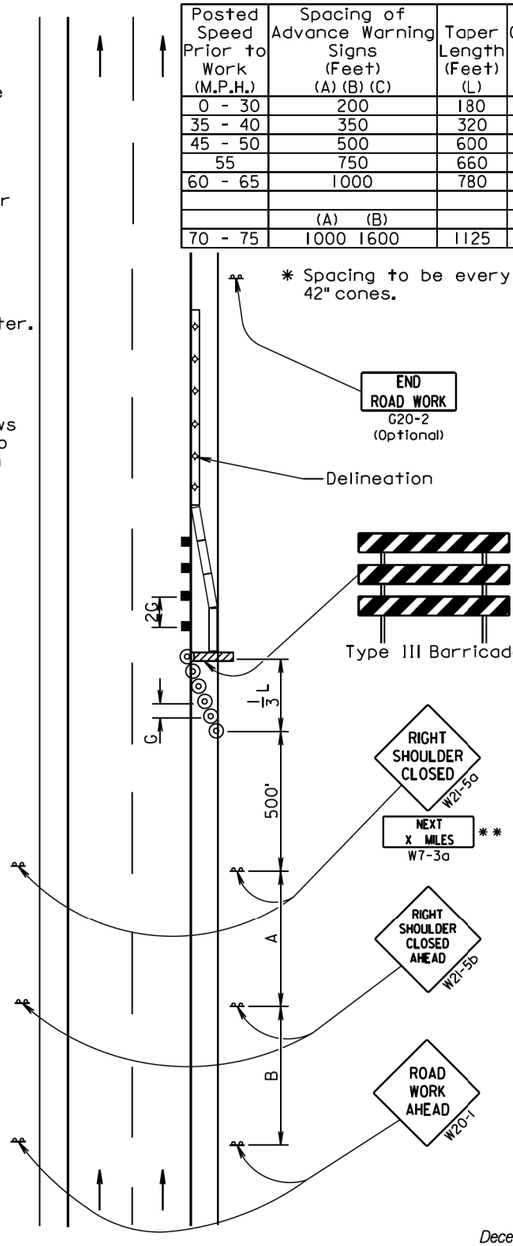
**For distances ½ mile or greater.

The barrier in this diagram shows one method that may be used to close a shoulder of a long term project. The use of a barrier should be based on the need determined by the Highway Authority.

The movable concrete barrier layout is shown 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 - 50	500	600	50 *
55	750	660	50 *
60 - 65	1000	780	50 *
	(A) (B)		
70 - 75	1000 1600	1125	50 *

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



December 23, 2012

Published Date: 1st Qtr. 2014	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES SHOULDER CLOSED	PLATE NUMBER 634.61 Sheet 1 of 1

** Shall be used for overnight and long term operations.

WITHOUT BARRIER

Posted Speed Prior to Work (M.P.H.)	Length of Longitudinal Buffer Space (Feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485
70	535
75	585

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.

◎ Reflectorized Drum

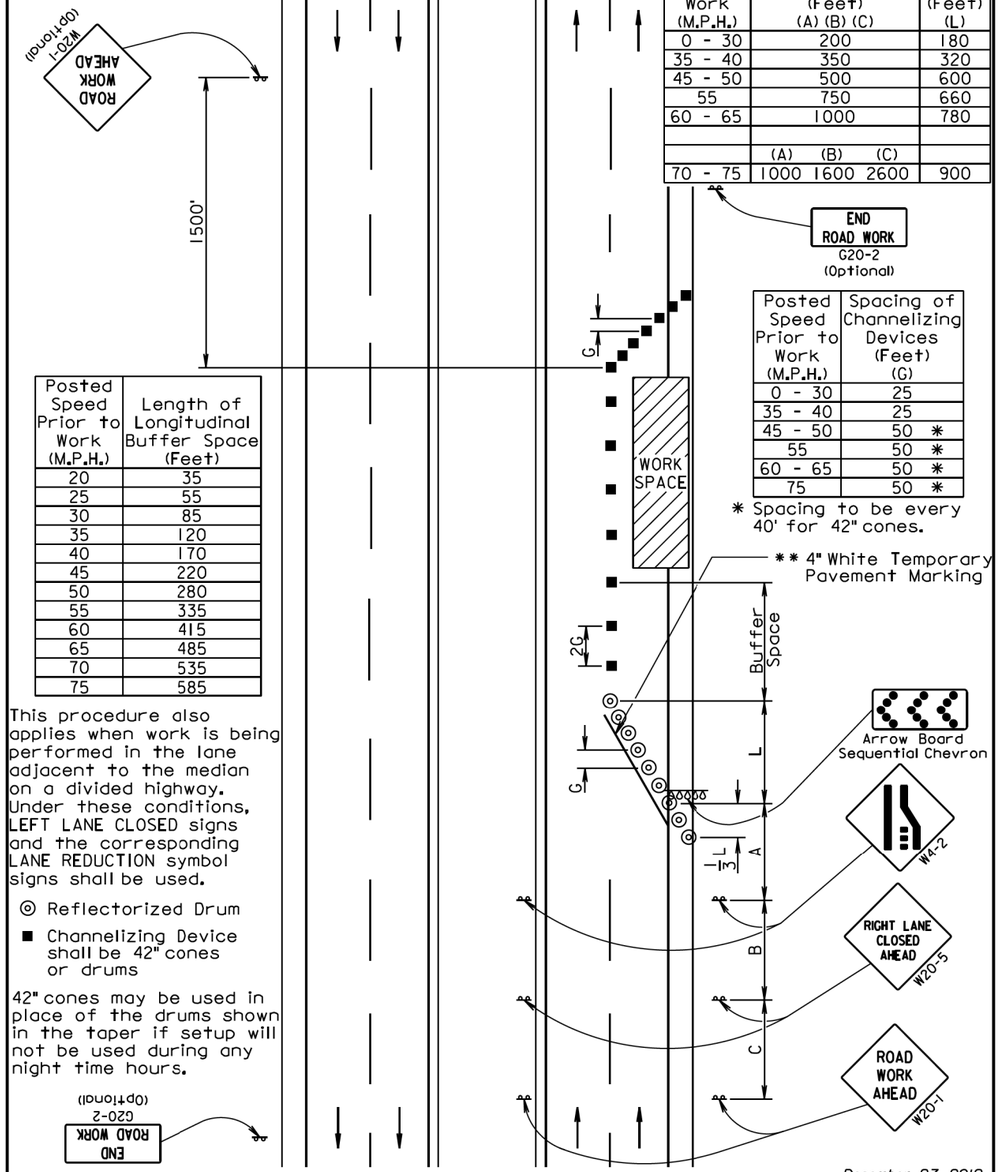
■ Channelizing Device shall be 42" cones or drums

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

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 - 75	1000 1600 2600	900

Posted Speed Prior to Work (M.P.H.)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	25
35 - 40	25
45 - 50	50 *
55	50 *
60 - 65	50 *
75	50 *

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



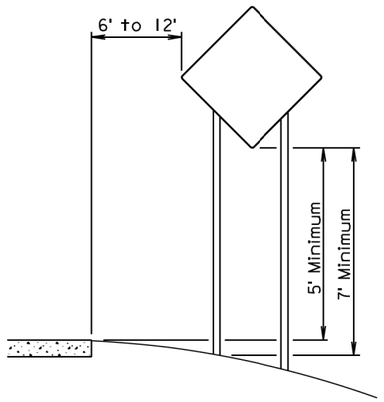
December 23, 2012

Published Date: 1st Qtr. 2014	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITHOUT BARRIER	PLATE NUMBER 634.64 Sheet 1 of 1

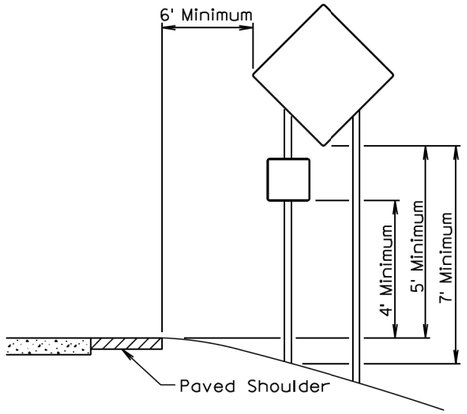
Plot Scale - 1:200

- Plotted From - trvl1nt23

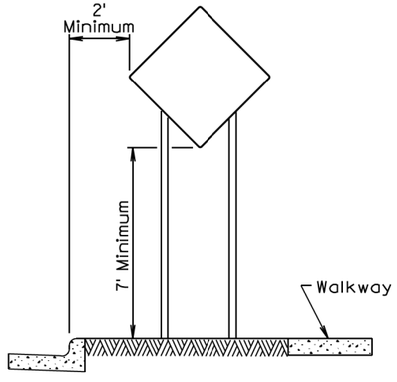
File - ...\Standard Plates\S634_61_64.dgn



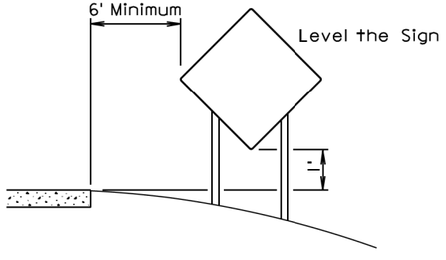
RURAL DISTRICT



RURAL DISTRICT WITH SUPPLEMENTAL PLATE



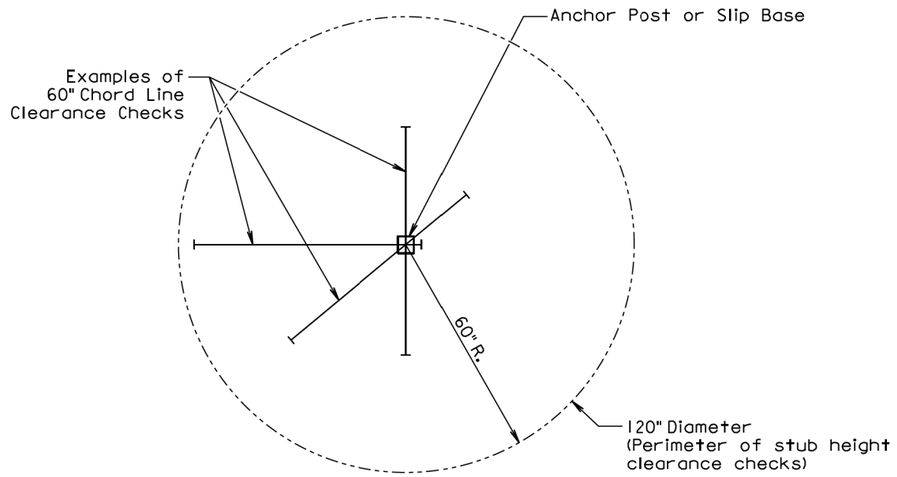
URBAN DISTRICT



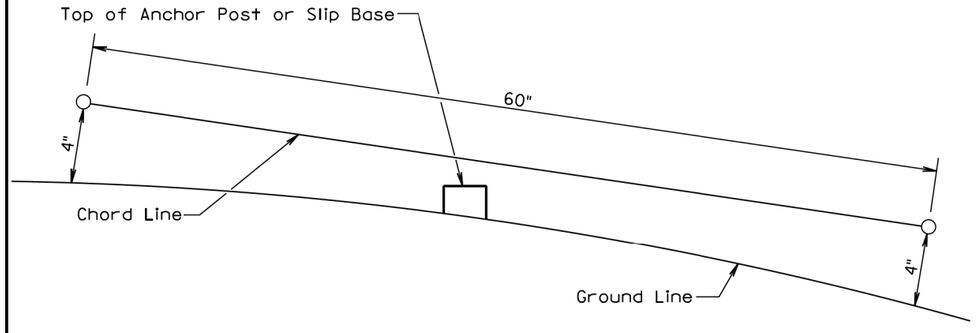
RURAL DISTRICT
3 DAY MAXIMUM

February 14, 2011

Published Date: 1st Qtr. 2014	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 1st Qtr. 2014	SDDOT	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1