

PROJECTS

STORM WATER PERMIT
NONE

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

Plotting Date: 08/22/2016

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|-----------------------|--------------------------------|-----------|--------------|
| | 000P-351, 000P-352, & 034P-352 | 1 | 27 |

Plotting Date: 08/22/2016

PROJECT 000P-351, 000P-352,
& 034P-352
HAAKON, HUGHES, JACKSON,
JONES, LYMAN, POTTER, STANLEY,
SULLY & ZIEBACH COUNTIES

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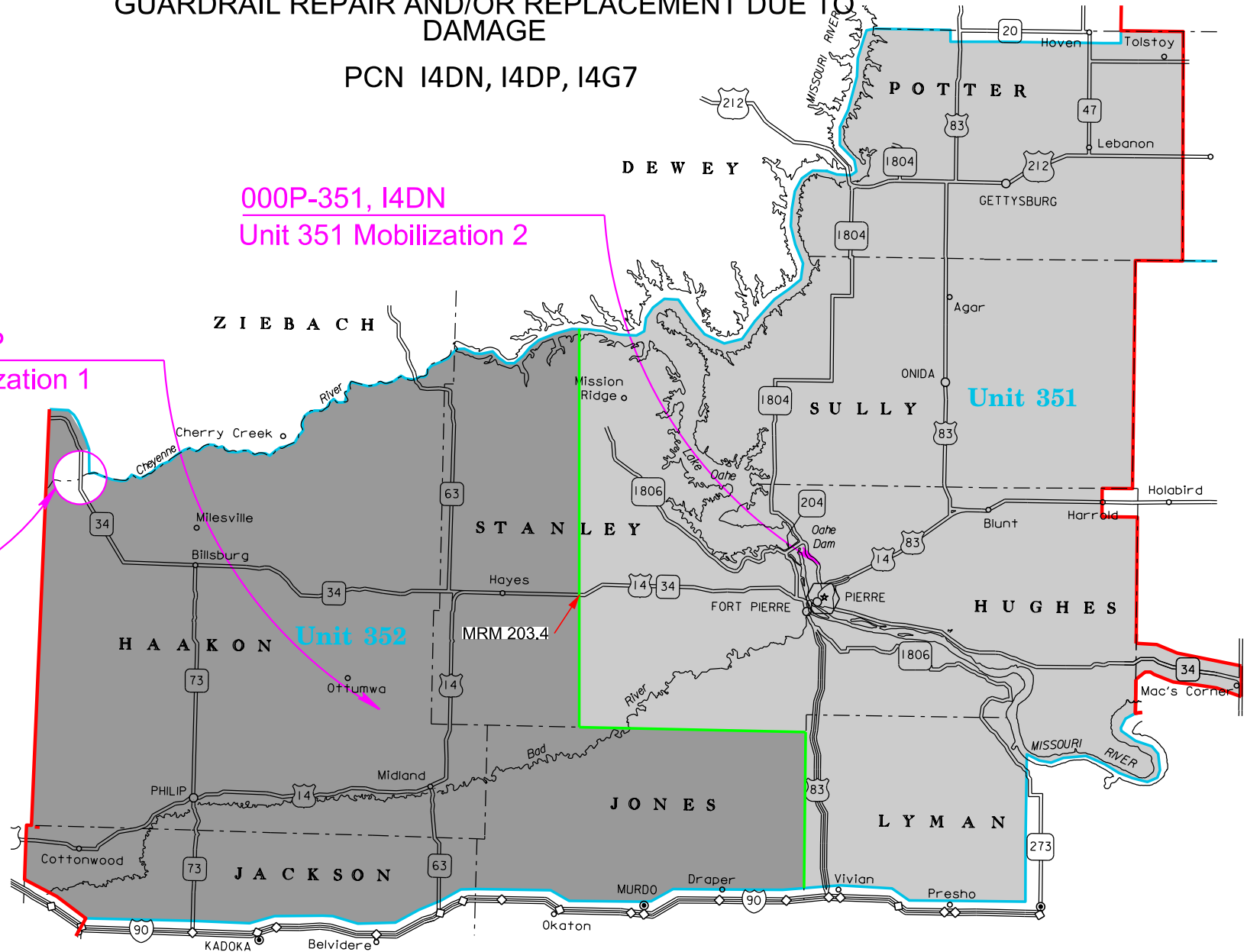
GUARDRAIL REPAIR AND/OR REPLACEMENT DUE TO
DAMAGE

PCN I4DN, I4DP, I4G7

000P-351, I4DN
Unit 351 Mobilization 2

000P-352, I4DP
Unit 352 Mobilization 1

034P-352, I4G7
Mobilization 3
Structure # 28-035-151
MRM 123.64 + 0.000



ESTIMATE OF QUANTITIES

I4DN:

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|--|----------|------|
| 009E0198 | Mobilization 2 | 3 | Each |
| 110E0707 | Remove High Tension 4 Cable Guardrail | 450 | Ft |
| 110E0730 | Remove Beam Guardrail | 300.0 | Ft |
| 110E0749 | Remove High Tension 4 Cable Guardrail Anchor Assembly | 1 | Each |
| 110E0790 | Remove W Beam Guardrail Deformed End | 1 | Each |
| 110E0800 | Remove W Beam Guardrail End Terminal | 4 | Each |
| 110E6230 | Remove W Beam Guardrail for Reset | 25.0 | Ft |
| 120E0600 | Contractor Furnished Borrow Excavation | 15 | CuYd |
| 260E1080 | Base Course, Salvaged, State Furnished | 15.0 | Ton |
| 629E0225 | Reset High Tension Cable Guardrail Terminal Post | 5 | Each |
| 629E0454 | Retension High Tension 4 Cable Guardrail | 450 | Ft |
| 629E1112 | Cable Splice | 5 | Each |
| 629E1117 | Turnbuckle Assembly | 5 | 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 |
| 630E0110 | Straight Double Class A Thrie Beam Guardrail with Wood Posts | 12.5 | Ft |
| 630E0200 | Straight Class A Thrie Beam Rail | 100.0 | Ft |
| 630E0210 | Straight Class B Thrie Beam Rail | 400.0 | Ft |
| 630E1150 | Straight Double Class B W Beam Guardrail with Wood Posts | 37.5 | Ft |
| 630E1200 | Straight Class A W Beam Rail | 300.0 | 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 | 4 | Each |
| 630E2030 | W Beam Guardrail Breakaway Cable Terminal | 1 | Each |
| 630E2110 | Beam Guardrail Post and Block | 40 | 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 |
| 632E2220 | Guardrail Delineator | 10 | Each |
| 634E0010 | Flagging | 60.0 | Hour |
| 634E0110 | Traffic Control Signs | 606.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0420 | Type C Advance Warning Arrow Board | 1 | Each |
| 634E0640 | Temporary Pavement Marking | 432 | Ft |
| 910E1070 | Labor and Equipment | 5 | Hour |

I4DP:

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|--|----------|------|
| 009E0197 | Mobilization 1 | 1 | Each |
| 110E0730 | Remove Beam Guardrail | 200.0 | Ft |
| 110E0800 | Remove W Beam Guardrail End Terminal | 3 | Each |
| 120E0600 | Contractor Furnished Borrow Excavation | 15 | CuYd |
| 260E1080 | Base Course, Salvaged, State Furnished | 15.0 | Ton |
| 630E0200 | Straight Class A Thrie Beam Rail | 100.0 | Ft |
| 630E0210 | Straight Class B Thrie Beam Rail | 25.0 | Ft |
| 630E1200 | Straight Class A W Beam Rail | 100.0 | Ft |
| 630E1210 | Straight Class B W Beam Rail | 50.0 | Ft |
| 630E2000 | W Beam to Thrie Beam Guardrail Transition | 3 | Each |
| 630E2010 | W Beam Guardrail End Terminal | 3 | Each |
| 630E2100 | Beam Guardrail Post | 10 | Each |
| 630E2105 | Beam Guardrail Block | 10 | Each |
| 630E2110 | Beam Guardrail Post and Block | 40 | Each |
| 630E2120 | Beam Guardrail Post and Block, Winter | 15 | Each |
| 630E5120 | Reset Thrie Beam Rail | 25.0 | Ft |
| 630E5160 | Reset W Beam Rail | 50.0 | Ft |
| 630E5520 | Drive Down Beam Guardrail Post | 10 | Each |
| 630E5530 | Remove and Reset Beam Guardrail Post and Block | 10 | Each |
| 632E2220 | Guardrail Delineator | 5 | Each |
| 634E0010 | Flagging | 10.0 | Hour |
| 634E0110 | Traffic Control Signs | 606.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0640 | Temporary Pavement Marking | 432 | Ft |
| 910E1070 | Labor and Equipment | 5 | Hour |

I4G7 CHEYENNE RIVER BRIDGE (STR# 28-035-151 MRM 123.64):

| BID ITEM NUMBER | ITEM | QUANTITY | UNIT |
|-----------------|--|----------|------|
| 009E0199 | Mobilization 3 | 1 | Each |
| 110E0730 | Remove Beam Guardrail | 437.5 | Ft |
| 260E1080 | Base Course, Salvaged, State Furnished | 15.0 | Ton |
| 630E0110 | Straight Double Class A Thrie Beam Guardrail with Wood Posts | 12.5 | Ft |
| 630E0210 | Straight Class B Thrie Beam Rail | 400.0 | Ft |
| 630E1010 | Straight Class A W Beam Guardrail with Wood Posts | 200.0 | Ft |
| 630E2000 | W Beam to Thrie Beam Guardrail Transition | 1 | Each |
| 630E2015 | W Beam Guardrail Flared End Terminal | 1 | Each |
| 630E2100 | Beam Guardrail Post | 1 | Each |
| 630E2105 | Beam Guardrail Block | 3 | Each |
| 632E2220 | Guardrail Delineator | 5 | Each |
| 634E0010 | Flagging | 20.0 | Hour |
| 634E0110 | Traffic Control Signs | 606.0 | SqFt |
| 634E0120 | Traffic Control, Miscellaneous | Lump Sum | LS |
| 634E0640 | Temporary Pavement Marking | 432 | Ft |
| 910E1070 | Labor and Equipment | 5 | Hour |

ESTIMATE OF QUANTITIES

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

SPECIFICATIONS

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

ENVIRONMENTAL COMMITMENTS

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

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT B4: BALD EAGLE

Bald eagles are known to occur in this area.

Action Taken/Required:

If a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

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

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

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

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

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

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

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|-----------------------------|------------------------------|--------------|-----------------|
| | 000P-351, 000P-352, 034P-352 | 4 | 27 |

SCOPE OF WORK

This project consists of guardrail repair within the several counties located in the South Dakota Department of Transportation Pierre Area, as ordered by the Engineer. The Pierre Area Engineer will inform the Contractor of any areas that are to be exempted from guardrail repair due to active construction projects. This information will detail the exemption limits from Mile Reference Marker to Mile Reference Marker and date to date that guardrail repair will not be conducted.

MOBILIZATION

Mobilization 1 is the cost of mobilization per each time the Contractor mobilizes to the project at the request of the Pierre Area Engineer, or his designated representative, to perform guardrail repair within the Pierre Area in Haakon, Jones, or Stanley counties. (West of Hayes)

Mobilization 2 is the cost of mobilization per each time the Contractor mobilizes to the project at the request of the Pierre Area Engineer, or his designated representative, to perform guardrail repair within the Pierre Area in Potter, Stanley, Sully, Hughes or Hyde counties. (East of Hayes)

Mobilization 3 is the cost of mobilization per each time the Contractor mobilizes to the project at the request of the Pierre Area Engineer, or his designated representative, to perform guardrail repair at the Cheyenne River Bridge, Structure # 28-035-151, MRM 123.64 on SD Highway 34.

Mobilization will be paid once each time the Contractor is required to mobilize to repair guardrail, regardless of the number of sites requiring repair within the project limits. Mobilization will be paid at the higher of the two Mobilization bid items if the Contractor is required to repair guardrail at sites within two of the Mobilization areas.

PROGRESS PAYMENTS

At the preconstruction meeting the Contractor will be given a Billing Sheet. 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.

GUARDRAIL COMPLETION REQUIREMENTS

The Contractor will be notified telephonically by the Pierre Area Engineer or his representative each time that guardrail repair is required. This telephonic notification will be confirmed in writing or by email with notification date, contract completion date, and specific list of sites and repairs to be accomplished during the mobilization listed on the correspondence.

The Contractor shall mobilize a crew to start repair work within 21 calendar days of notification and will have a maximum of 10 working days, inclusive of the 21 days for mobilization, to complete the repairs. If additional sites exist, the Contractor will have an additional 5 working days per each additional site to complete the work required.

If the Contractor fails to complete the required work within the time allowed, the Contractor will install an approved safety treatment that complies with NCHRP 350 or MASH level 3 to protect the site. Failure to comply with this requirement will necessitate liquidated damages being assessed at the rate of \$500 for each calendar day that the guardrail work remains incomplete for the item of concern. This provision applies up to the contract completion date. After the contract completion date, liquidated damages will be assessed in accordance with Section 8.8 or \$500, whichever is greater.

Section 8.6 A (Working Day Contracts) of the Specifications shall be followed, with the following exception. A working day shall be defined as any calendar day between January 1 and December 31, inclusive, except Sundays or legal holidays.

UTILITIES

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

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

GENERAL MAINTENANCE OF TRAFFIC

The plan quantity for Traffic Control Signs is based on the Contractor mobilizing three times to repair guardrail and the required number of traffic control devices to construct one work zone for each mobilization. Signs that are reused at different sites during the same mobilization shall be paid for only once. Signs that have tabs or are hinged to expedite changing the message will be considered as one sign for payment. Traffic control signs will be measured and paid each time the Contractor is mobilized to repair guardrail.

Equipment will be confined to the shoulder, and the driving lane closed to traffic.

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

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

Traffic control shall be in accordance with Section 634 of the specifications and the plan notes. All traffic control devices are to be in like new condition. Any traffic control device that warrants replacement due to its poor condition or absence shall be replaced immediately by the Contractor at 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 flagger symbol sign (W20-7) shall be placed a minimum of 500 feet in front of flagger station.

LABOR AND EQUIPMENT

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

CONTRACTOR FURNISHED BORROW EXCAVATION

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

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

GENERAL GUARDRAIL REPAIR

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

HIGH TENSION GUARDRAIL

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

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

High Tension Guardrail Bid Items

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

High Tension Guardrail Bid Items Payment Information Explanation

1. This item to be used when a terminal post needs to be reset if the cable was released after post was struck. Post needs to be in good working condition. Payment includes cost for resetting the terminal post including, hardware, tensioning cable, labor, equipment, and incidentals.
2. Payment includes cost for all labor and equipment to tension the high tension 4 cable guardrail to current specifications. Measurement shall be measured to the nearest foot from the center of anchor assembly to center of anchor assembly. For example: If the system utilizes four anchor footings in the anchor assembly, then the center of the anchor assembly would be centered between the second and third footing.
3. Bid item may be used for splicing high tension cable guardrail or low tension standard 3 cable guardrail. Payment for cable splice includes cost for cutting cable as necessary, furnishing and installing the cable splice, labor, equipment, and incidentals.

4. Bid item may be used for furnishing and installing turnbuckle assembly for high tension or low tension cable guardrail. This item is used for a typical repair if a turnbuckle is damaged and a new one needs to be installed. Payment for turnbuckle assembly includes cost for cutting the cable as necessary, furnishing and installing the turnbuckle assembly, labor, equipment, and incidentals.
5. Bid item may be used for furnishing and installing a high tension 4 cable guardrail post. This item is used for a typical repair if a high tension 4 cable guardrail post is damaged and a new one needs to be installed. Payment includes cost for furnishing and installing a high tension 4 cable guardrail post, new hardware, labor, equipment, and incidentals.
6. Bid item may be used for furnishing and installing a high tension 4 cable guardrail post and sleeve. This item is used for a typical repair if a high tension 4 cable guardrail post and sleeve is damaged and a new one needs to be installed. Payment includes cost for furnishing and installing a high tension 4 cable guardrail post and sleeve, new hardware, labor, equipment, and incidentals.
7. Bid item may be used for furnishing and installing a high tension 4 cable guardrail sleeve. This item is used for a typical repair if a high tension 4 cable guardrail sleeve is damaged and a new one needs to be installed. Payment includes cost for furnishing and installing a high tension 4 cable guardrail sleeve, new hardware, resetting post, labor, equipment, and incidentals.
8. Bid item may be used for furnishing and installing a high tension cable guardrail terminal post. This item is used for a typical repair if a high tension cable guardrail terminal post is damaged and a new one needs to be installed. Use this item even if there is only one terminal post for the anchorage system as some systems has a terminal post for every cable and have multiple footings and terminal posts depending on the number of cables. Payment includes cost for furnishing and installing a high tension cable guardrail terminal post, new hardware, labor, equipment, and incidentals.
9. Bid item may be used for furnishing and installing the hardware for a high tension cable guardrail terminal post. This item is used for a typical repair if a high tension cable guardrail terminal post is struck and releases the cable(s). Use this item when the terminal post is in good condition and only new hardware and resetting the terminal post is necessary. Payment includes cost for furnishing and installing hardware for the high tension cable attachment to terminal post, resetting terminal post, labor, equipment, and incidentals.
10. Bid item may be used for furnishing and installing the hardware for a high tension cable attachment to post. This item is used for a typical repair if the hardware was damaged by a snow plow or other crash. Use this item when the post is in good condition and only new hardware is necessary. The quantity and unit for the bid item is one "Each" for one attachment, i.e. if all attachments are damaged on a high tension 4 cable guardrail post then the quantity would be 4. Payment includes cost for furnishing and installing hardware for the high tension cable attachment to post, labor, equipment, and incidentals.
11. This bid item is specific to products from Trinity known as the CASS high tension cable barrier. Use this item when only the post strap needs to be replaced. This part would be included in the price of the post if a new post is needed. Payment includes cost for furnishing and installing the high tension cable guardrail post strap, labor, equipment, and incidentals.

12. This bid item is specific to products from Trinity known as the CASS high tension cable barrier. This part typically has white or yellow reflectorized delineation on it. Use this item when only the cable spacer needs to be replaced. This part would be included in the price of the post if a new post is needed. Payment includes cost for furnishing and installing the high tension cable guardrail cable spacer, labor, equipment, and incidentals.
13. This bid item will be used for furnishing and installing cable for high tension (pre-stretched) or low tension (pre-stretched or non-pre-stretched) cable guardrail for a typical repair if a cable is damaged and a new piece needs to be installed. Payment for each cable includes cost for cutting the cable as necessary, furnishing and installing the cable, labor, equipment, and incidentals.
- GUARDRAIL
1. When guardrail adjoining bridge ends is ordered to be repaired, the contractor will replace with an NCHPR 350 TL3 approved system. Post spacing will be in accordance with current specifications. See Standard Plates 630.15, 630.20, 630.21, and 630.50 for post spacing and post length requirements.
2. When the SDDOT instructs the Contractor to replace a W Beam guardrail end terminal, the new W Beam guardrail end terminal shall be an approved type (flared or tangent) that is compatible with what 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 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. "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.
6. "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.
7. The Contractor shall place state furnished asphalt optimix material 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 corresponding SDDOT Maintenance Yard. The material shall be placed ½" high around the post to force the water to drain away from the post. This material shall be compacted to the satisfaction of the Engineer.

GUARDRAIL (CONTINUED)

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

BASE COURSE, SALVAGED, STATE FURNISHED

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

Base Course, Salvaged, State Furnished will be available from the SDDOT Maintenance Yards located at Philip, legal description of SW1/4, NE 1/4, Section 13, T1N, R20E; and Pierre, legal description of NE1/4, Section 3, T110N, R79W. This material can be used without testing.

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

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

The Contractor may be required to place state furnished asphalt optimix on this project around the guardrail posts to ensure proper drainage.

The asphalt optimix material is located in the SDDOT Maintenance Yard located at Philip, legal description of SW1/4, NE 1/4, Section 13, T1N, R20E; and Pierre, legal description of NE1/4, Section 3, T110N, R79W. This material is royalty free to the Contractor. Furnish cost to the State for state furnished asphalt optimix type material is \$81.00 per ton.

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

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

The tables below detail itemized traffic control devices for one setup to construct one work zone for each mobilization.

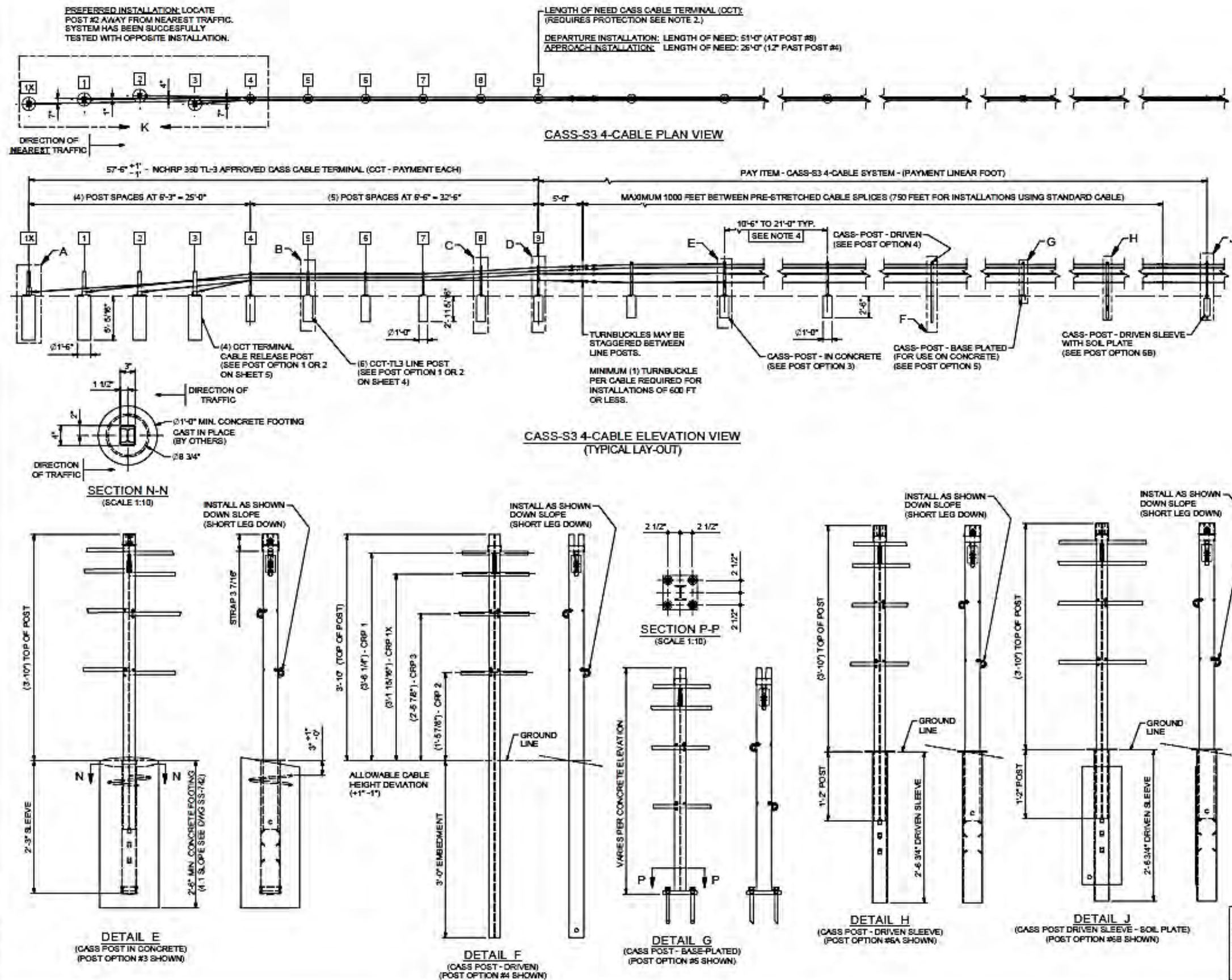
| | | 000P-351, I4DN | | | |
|-----------|-------------------------------------|--|-----------|---------------|------|
| SIGN CODE | SIGN DESCRIPTION | NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
| R1-1 | STOP | 2 | 30" | 5.2 | 10.4 |
| W1-3 | REVERSE TURN (R) | 1 | 48" x 48" | 16.0 | 16.0 |
| W1-4 | REVERSE CURVE (R) | 1 | 48" x 48" | 16.0 | 16.0 |
| W3-1 | STOP AHEAD (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W13-1P | ADVISORY SPEED (plaque) | 2 | 30" x 30" | 6.3 | 12.6 |
| W16-2P | FEET (supplemental distance plaque) | 2 | 30" x 24" | 5 | 10 |
| W20-1 | ROAD WORK AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-4 | ONE LANE ROAD AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16 | 32 |
| G20-2 | END ROAD WORK | 2 | 36" x 18" | 5 | 9 |
| | | CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT | | | |
| | | 202 | | | |

| | | 000P-352, I4DP | | | |
|-----------|-------------------------------------|--|-----------|---------------|------|
| SIGN CODE | SIGN DESCRIPTION | NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
| R1-1 | STOP | 2 | 30" | 5.2 | 10.4 |
| W1-3 | REVERSE TURN (R) | 1 | 48" x 48" | 16.0 | 16.0 |
| W1-4 | REVERSE CURVE (R) | 1 | 48" x 48" | 16.0 | 16.0 |
| W3-1 | STOP AHEAD (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W13-1P | ADVISORY SPEED (plaque) | 2 | 30" x 30" | 6.3 | 12.6 |
| W16-2P | FEET (supplemental distance plaque) | 2 | 30" x 24" | 5 | 10 |
| W20-1 | ROAD WORK AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-4 | ONE LANE ROAD AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16 | 32 |
| G20-2 | END ROAD WORK | 2 | 36" x 18" | 5 | 9 |
| | | CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT | | | |
| | | 202 | | | |

| | | 034P-351, I4G7 | | | |
|-----------|-------------------------------------|--|-----------|---------------|------|
| SIGN CODE | SIGN DESCRIPTION | NUMBER | SIGN SIZE | SQFT PER SIGN | SQFT |
| R1-1 | STOP | 2 | 30" | 5.2 | 10.4 |
| W1-3 | REVERSE TURN (R) | 1 | 48" x 48" | 16.0 | 16.0 |
| W1-4 | REVERSE CURVE (R) | 1 | 48" x 48" | 16.0 | 16.0 |
| W3-1 | STOP AHEAD (symbol) | 2 | 48" x 48" | 16.0 | 32.0 |
| W13-1P | ADVISORY SPEED (plaque) | 2 | 30" x 30" | 6.3 | 12.6 |
| W16-2P | FEET (supplemental distance plaque) | 2 | 30" x 24" | 5 | 10 |
| W20-1 | ROAD WORK AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-4 | ONE LANE ROAD AHEAD | 2 | 48" x 48" | 16 | 32 |
| W20-7 | FLAGGER (symbol) | 2 | 48" x 48" | 16 | 32 |
| G20-2 | END ROAD WORK | 2 | 36" x 18" | 5 | 9 |
| | | CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT | | | |
| | | 202 | | | |

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

| | | | |
|-----------------------------|------------------------------|--------------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
| | 000P-351, 000P-352, 034P-352 | 7 | 27 |



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 8:1 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 SUSCEPTIBLE 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 S3-742) 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) 644-7978

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

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PROJ: CASS-S3-1

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

TRINITY HIGHWAY PRODUCTS, LLC.

| | |
|------------------------|---------|
| SPEC: | |
| SHIPPING WT: | |
| DRW: E.A.S. 11/14/2010 | |
| CHK: | |
| SHT: 1 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 |
| | 000P-351, 000P-352, 034P-352 | 8 | 27 |

| 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 | 34039G | 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 |

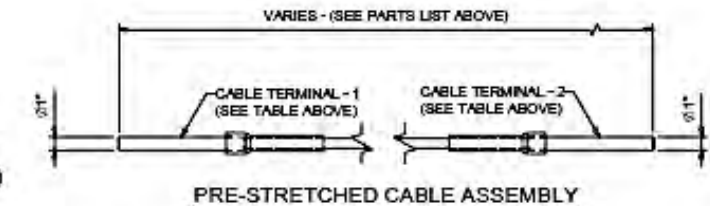
| PARTS LIST - CASS-S3 POST DRIVEN - OPTION #4 | | | |
|--|---------|--------------------------|------------|
| QTY | PART No | TITLE | Lbs / Each |
| 2 | 3245G | 5/16 DIA. HEX NUT (A563) | 0.01 |
| 2 | 4225G | CABLE LOCK BOLT (A307) | 0.09 |
| 1 | 5700B | CASS & TL3 CABLE SPACER | 0.11 |
| 1 | 34036G | 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 - BE283548) | |
| 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 | 34'-4" | R.H.T. | L.H.T. | 58.3 |
| 1 | 5818 | OCT CABLE ASSEMBLY-MID | 48'-1" | R.H.T. | L.H.T. | 62.3 |
| 1 | 5819 | OCT CABLE ASSEMBLY-BOT | 41'-10" | R.H.T. | L.H.T. | 46.3 |
| 1 | 5867 | OCT CABLE ASSEMBLY | 25'-0" | R.H.T. | L.H.T. | 30.9 |
| 1 | 5815 | CABLE ASSEMBLY-INTERIOR | 1000' | R.H.T. | L.H.T. | 967.0 |
| 1 | 5753 | CABLE FIELD SPICE SECTION | 1025' | R.H.T. | NONE | 965.0 |
| 1 | 5752 | CABLE FIELD SPICE SECTION | 1000' | R.H.T. | NONE | 965.0 |
| 1 | 5758 | CABLE FIELD SPICE SECTION | 975' | R.H.T. | NONE | 960.9 |
| 1 | 5757 | CABLE FIELD SPICE SECTION | 950' | R.H.T. | NONE | 916.9 |
| 1 | 5756 | CABLE FIELD SPICE SECTION | 925' | R.H.T. | NONE | 882.8 |
| 1 | 5755 | CABLE FIELD SPICE SECTION | 900' | R.H.T. | NONE | 868.8 |
| 1 | 5754 | CABLE FIELD SPICE SECTION | 875' | R.H.T. | NONE | 844.7 |
| 1 | 5753 | CABLE FIELD SPICE SECTION | 850' | R.H.T. | NONE | 820.7 |
| 1 | 5752 | CABLE FIELD SPICE SECTION | 825' | R.H.T. | NONE | 796.6 |
| 1 | 5751 | CABLE FIELD SPICE SECTION | 800' | R.H.T. | NONE | 772.5 |
| 1 | 5750 | CABLE FIELD SPICE SECTION | 775' | R.H.T. | NONE | 748.5 |
| 1 | 5749 | CABLE FIELD SPICE SECTION | 750' | R.H.T. | NONE | 724.5 |
| 1 | 5748 | CABLE FIELD SPICE SECTION | 725' | R.H.T. | NONE | 700.4 |
| 1 | 5747 | CABLE FIELD SPICE SECTION | 700' | R.H.T. | NONE | 676.4 |
| 1 | 5746 | CABLE FIELD SPICE SECTION | 675' | R.H.T. | NONE | 652.3 |
| 1 | 5745 | CABLE FIELD SPICE SECTION | 650' | R.H.T. | NONE | 628.3 |
| 1 | 5744 | CABLE FIELD SPICE SECTION | 625' | R.H.T. | NONE | 604.2 |
| 1 | 5743 | CABLE FIELD SPICE SECTION | 600' | R.H.T. | NONE | 580.2 |
| 1 | 5742 | CABLE FIELD SPICE SECTION | 575' | R.H.T. | NONE | 556.1 |
| 1 | 5741 | CABLE FIELD SPICE SECTION | 550' | R.H.T. | NONE | 532.1 |
| 1 | 5740 | CABLE FIELD SPICE SECTION | 525' | R.H.T. | NONE | 508.0 |
| 1 | 5739 | CABLE FIELD SPICE SECTION | 500' | R.H.T. | NONE | 484.0 |
| 1 | 5738 | CABLE FIELD SPICE SECTION | 475' | R.H.T. | NONE | 459.9 |
| 1 | 5737 | CABLE FIELD SPICE SECTION | 450' | R.H.T. | NONE | 435.9 |
| 1 | 5736 | CABLE FIELD SPICE SECTION | 425' | R.H.T. | NONE | 411.8 |
| 1 | 5735 | CABLE FIELD SPICE SECTION | 400' | R.H.T. | NONE | 387.8 |
| 1 | 5734 | CABLE FIELD SPICE SECTION | 375' | R.H.T. | NONE | 363.7 |
| 1 | 5733 | CABLE FIELD SPICE SECTION | 350' | R.H.T. | NONE | 339.7 |
| 1 | 5732 | CABLE FIELD SPICE SECTION | 325' | R.H.T. | NONE | 315.7 |
| 1 | 5731 | CABLE FIELD SPICE SECTION | 300' | R.H.T. | NONE | 291.6 |
| 1 | 5730 | CABLE FIELD SPICE SECTION | 275' | R.H.T. | NONE | 267.6 |
| 1 | 5729 | CABLE FIELD SPICE SECTION | 250' | R.H.T. | NONE | 243.5 |
| 1 | 5728 | CABLE FIELD SPICE SECTION | 225' | R.H.T. | NONE | 219.5 |
| 1 | 5727 | CABLE FIELD SPICE SECTION | 200' | R.H.T. | NONE | 195.4 |
| 1 | 5726 | CABLE FIELD SPICE SECTION | 175' | R.H.T. | NONE | 171.4 |
| 1 | 5725 | CABLE FIELD SPICE SECTION | 150' | R.H.T. | NONE | 147.3 |
| 1 | 5724 | CABLE FIELD SPICE SECTION | 125' | R.H.T. | NONE | 123.3 |
| 1 | 5723 | CABLE FIELD SPICE SECTION | 100' | R.H.T. | NONE | 99.2 |
| 1 | 5722 | CABLE FIELD SPICE SECTION | 75' | R.H.T. | NONE | 75.2 |
| 1 | 5721 | CABLE FIELD SPICE SECTION | 50' | R.H.T. | NONE | 51.1 |
| 1 | 5720 | CABLE FIELD SPICE SECTION | 25' | R.H.T. | NONE | 27.1 |
| 1 | 5840 | CABLE FIELD REPAIR SECTION | 5' | R.H.T. | L.H.T. | 10.8 |

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



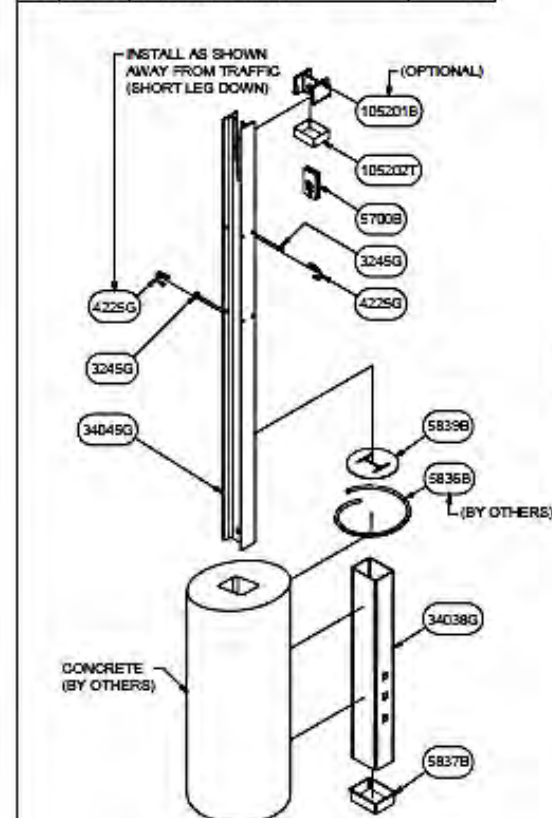
- NOTES:
- IN LIEU OF BLACK SPACER 5700B SUPPLY YELLOW REFLECTIVE SPACER 5701B OR WHITE REFLECTIVE SPACER 5702. (AS REQUIRED PER PROJECT PLANS)
 - IF INTERFERENCE OCCURS BETWEEN THE CABLE SPICE AND CASS-TL3 POST, SUPPLY A SPICE INTERFERENCE POST. LONG SPICE POST 34061G IN LIEU OF LONG CASS-S3 POST 34036G. SHORT SPICE POST 34049G IN LIEU OF SHORT CASS-S3 POST 34045G.
 - IF REQUIRED PER PROJECT PLANS SUPPLY:
CABLE PULLING TOOL 5850B
CABLE TENSION METER 5878B
CABLE THERMOMETER 5708B

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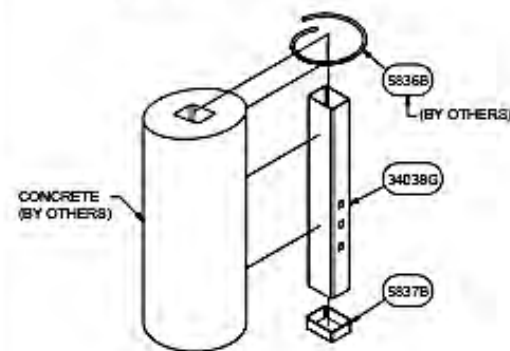
CASS-S3 (6:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY
PRODUCTS, LLC

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

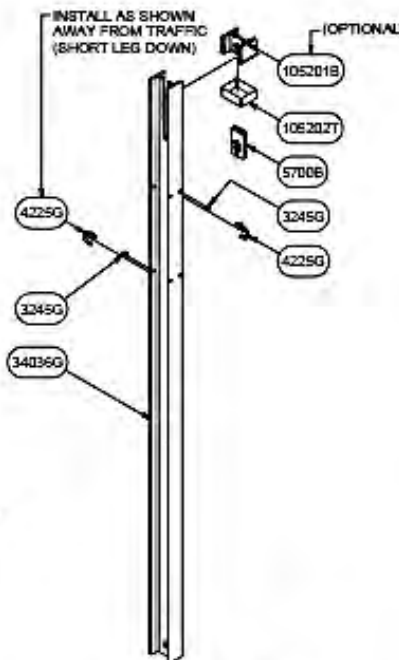


CASS-S3 POST - IN CONCRETE
(POST OPTION #3 - CAST IN PLACE)

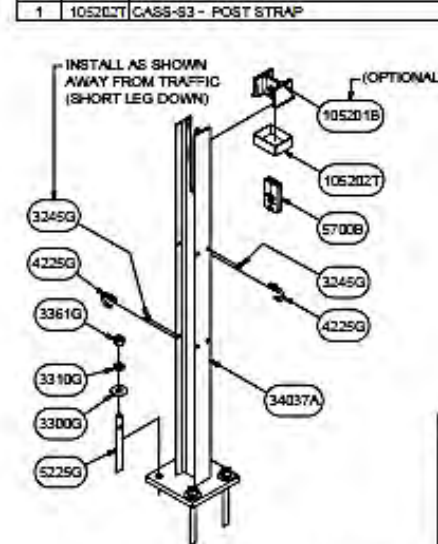


CONCRETE FOOTING ASSEMBLY
(POST OPTION #3 - PRE-CAST OPTION)

| PARTS LIST - PRE-CAST CONCRETE FOOTING - OPTION #3 | | | |
|--|---------|---------------------------------|------------|
| QTY | PART No | TITLE | Lbs / Each |
| 1 | 5836B | CONCRETE REINFORCING RING | 0.88 |
| 1 | 5837B | SLEEVE CAP - CASS-TERMINAL POST | 0.12 |
| 1 | 34039G | 27" POST SLEEVE - IN CONCRETE | 12.19 |

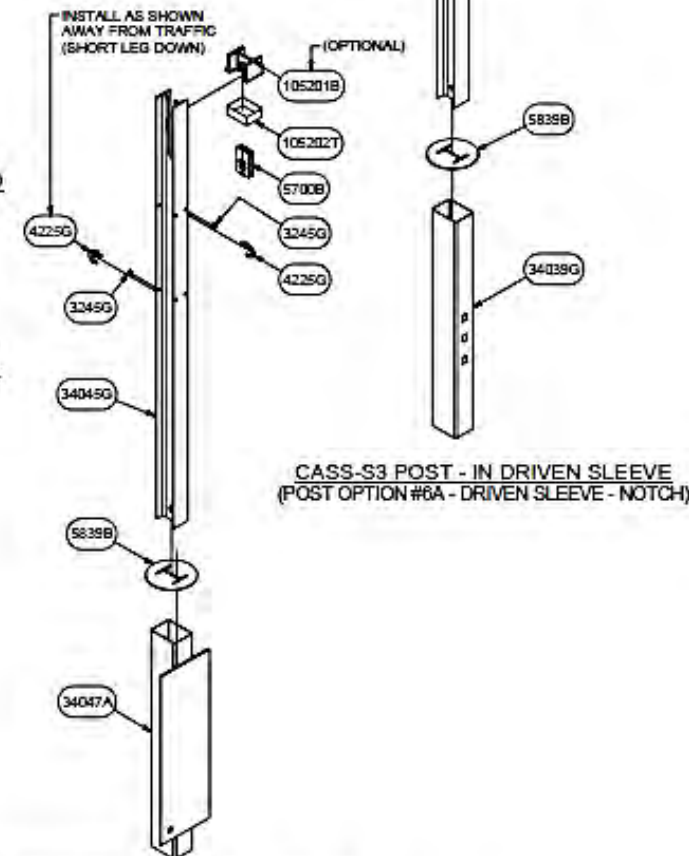


CASS-S3 POST - DRIVEN
(POST OPTION #4 - DRIVEN)



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.
- 5/8" ADHESIVE ANCHORING SYSTEM.
(4 EACH 3300G, 3310G, 3361G & 5225G) & 0.6 EACH 5448B
 - 5/8" x 6" ALL THREADED ROD (A449) WITH EPOXY.
(4 EACH 3300G, 3310G, 3361G & 5225G) & 0.6 EACH 5448B
 - 5/8" MECHANICAL ANCHOR. (BY OTHERS)



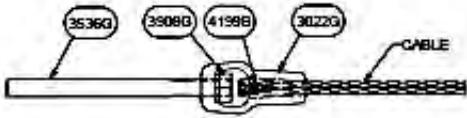
CASS-S3 POST - IN DRIVEN SLEEVE
(POST OPTION #6A - DRIVEN SLEEVE - NOTCH)

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 |

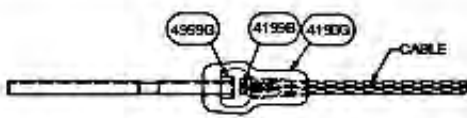
TRINITY HIGHWAY PRODUCTS CASS-S3 4-CABLE GUARDRAIL SAFETY SYSTEM

| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
|-----------------------|------------------------------|-----------|--------------|
| | 000P-351, 000P-352, 034P-352 | 9 | 27 |



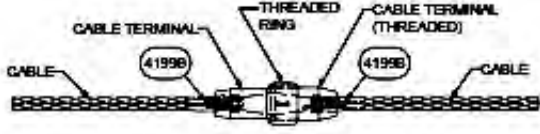
1" CABLE FIELD SPLICE - 5909G & 5910G
(5910G SHOWN, 5909G SIMILAR)

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



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

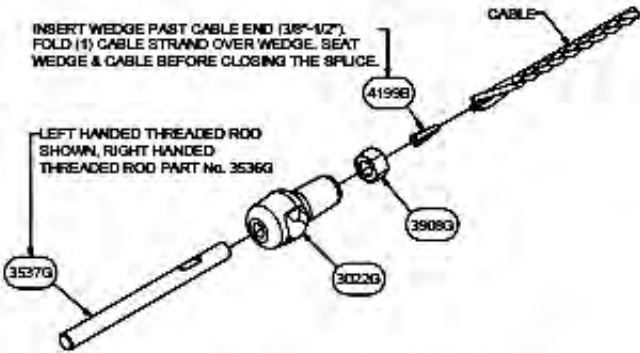
| QTY | PART No | TITLE | Lbs / Each |
|-----|---------|------------------------------|------------|
| 1 | 105304G | 3/4" STUD FLATTENED - L.H.T. | 1.62 |
| 1 | 4190G | CABLE END CASTING | 3.78 |
| 1 | 4199B | 3/4" CABLE WEDGE (3 x 7) | 0.08 |
| 1 | 4959G | 3/4" HEAVY SQUARE NUT (A563) | 0.26 |



TORPEDO CABLE SPLICE - 4099G

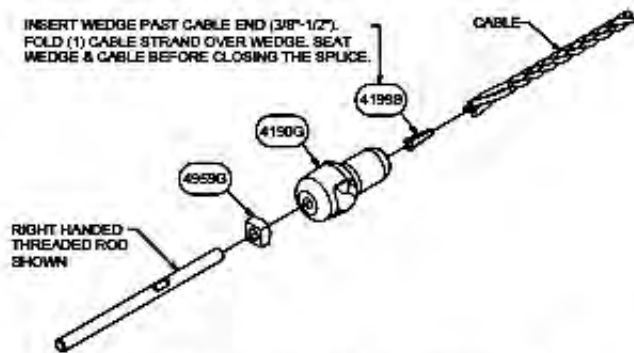
| QTY | PART No | TITLE | Lbs / Each |
|-----|---------|---------------------------|------------|
| 1 | | CABLE TERMINAL - THREADED | 1.79 |
| 1 | | CABLE TERMINAL | 1.52 |
| 1 | | RING - THREADED | -0.06 |
| 2 | 4199B | 3/4" CABLE WEDGE (3 x 7) | 0.08 |

| CASS TEMPERATURE & TENSION CHART (NEAREST 100 LBF) | | |
|--|---------------------|------------------------|
| FAHRENHEIT DEGREES | STD. CABLE LB/FORCE | PRE-STRETCHED LB/FORCE |
| < -15 | 5800 | 7500 |
| -10 | 6600 | 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 |



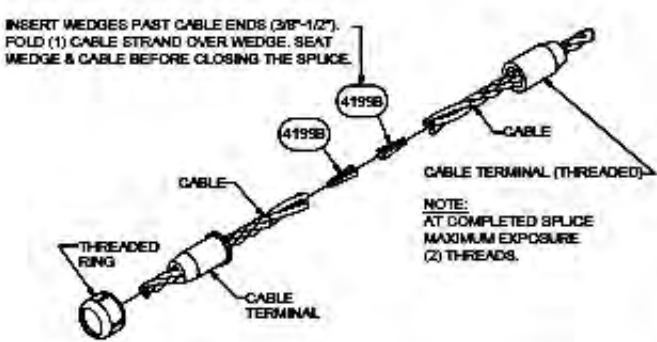
ASSEMBLY - 1" CABLE FIELD SPLICE - 5909G
(5909G SHOWN, 5910G SIMILAR)

| 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 |



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

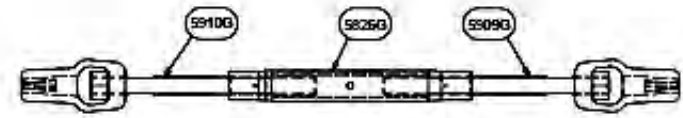
| QTY | PART No | TITLE | Lbs / Each |
|-----|---------|------------------------------|------------|
| 1 | 105205G | 3/4" STUD FLATTENED - R.H.T. | 1.62 |
| 1 | 4190G | CABLE END CASTING | 3.78 |
| 1 | 4199B | 3/4" CABLE WEDGE (3 x 7) | 0.08 |
| 1 | 4959G | 3/4" HEAVY SQUARE NUT (A563) | 0.26 |



ASSEMBLY - TORPEDO CABLE SPLICE 4099G

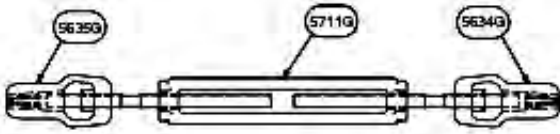
ALLOWABLE DEVIATION FROM CHART IN TANGENT SECTIONS:
+800, -200 POUNDS/FORCE.

CABLE TENSION READINGS ARE TYPICALLY HIGHER IN CURVED CABLE SECTIONS.



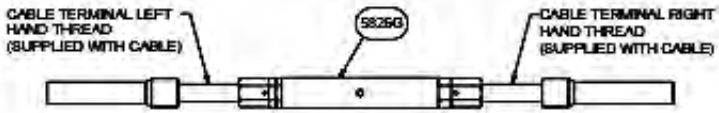
1" CABLE SPLICE - 5633G
(CLOSED BODY STYLE)

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



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

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



1" TURNBUCKLE - 5826G
(CLOSED BODY STYLE)

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

- NOTE:
- 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.
 - 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.

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PROJ: CASS-S3_6-1

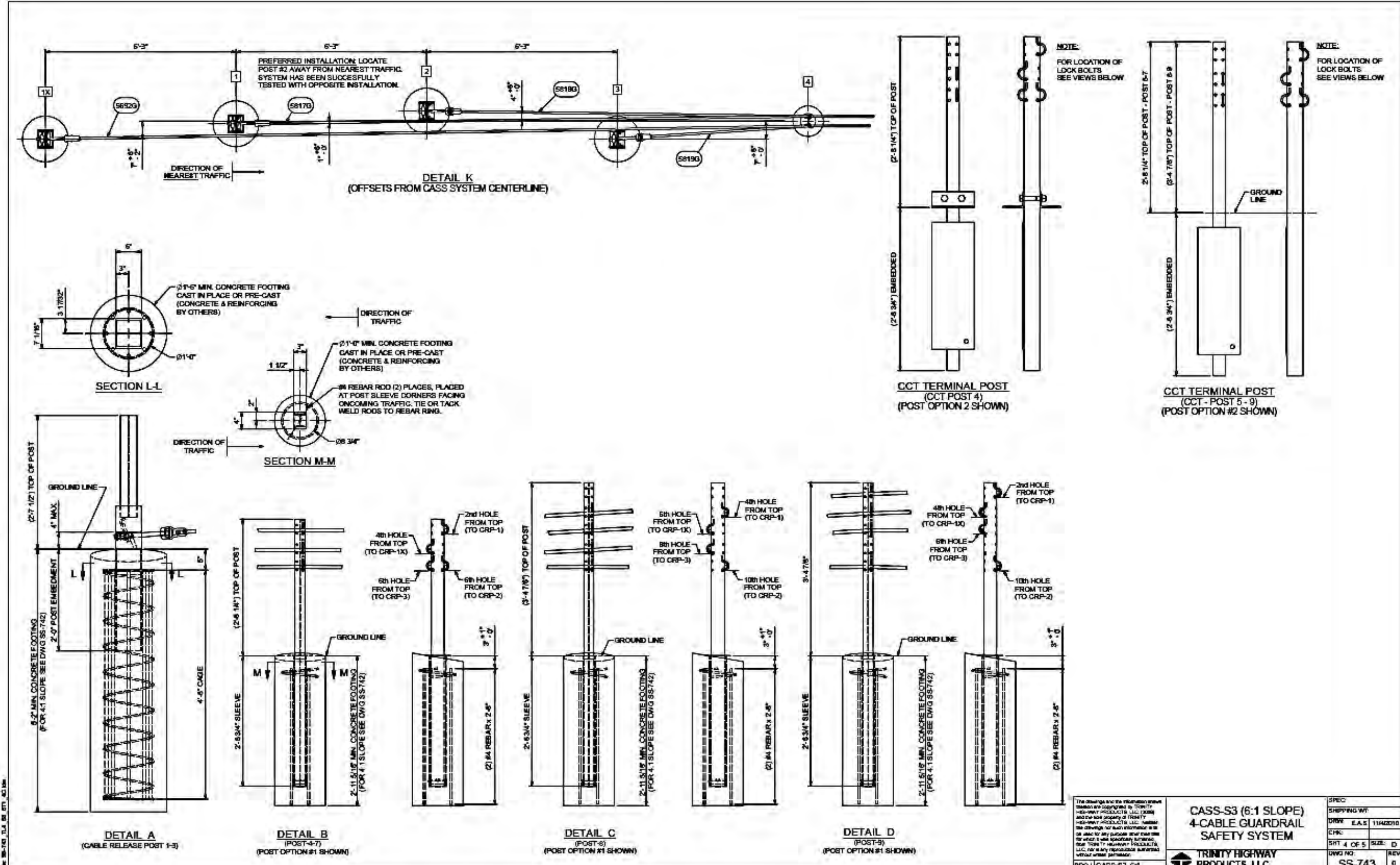
CASS-S3 (6:1 SLOPE)
4-CABLE GUARDRAIL
SAFETY SYSTEM

TRINITY HIGHWAY
PRODUCTS, LLC

| SPEC | |
|--------------|------------|
| SHIPPING WT: | |
| DRWG. E.A.S. | 11/14/2018 |
| CHK: | |
| SHT 3 OF 5 | SIZE: D |
| DWG NO. | REV |
| SS-743 | 0 |

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

| | | | |
|-----------------------------|------------------------------|--------------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
| | 000P-351, 000P-352, 034P-352 | 10 | 27 |



| | | | |
|---|---|-----|-------------------------|
| The drawings and the information shown herein are copyrighted by Trinity Highway Products, LLC. No part of this drawing may be reproduced without the written permission of Trinity Highway Products, LLC. | CASS-S3 (6:1 SLOPE) 4-CABLE GUARDRAIL SAFETY SYSTEM | | SPEC |
| | TRINITY HIGHWAY PRODUCTS, LLC | | SHIPPING WT |
| | PROJECT: 000P-351, 000P-352, 034P-352 | | DATE: E.A.S. 11/14/2010 |
| | SHEET 4 OF 5 | | SIZE: D |
| DWG NO. SS-743 | | REV | 0 |

| | | | |
|-----------------------------|------------------------------|--------------|-----------------|
| STATE OF SOUTH DAKOTA | PROJECT | SHEET NO. | TOTAL SHEETS |
| | 000P-351, 000P-352, 034P-352 | 11 | 27 |

| PARTS LIST - OCT TERMINAL POST No. 8-9 - IN CONCRETE | | | |
|--|----------|---------------------------------|------------|
| QTY | PART NO. | TITLE | Lbs / Each |
| 4 | 3245G | 5/16 DIA. HEX NUT (A583) | 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 | 5915B | #4 REBAR - TERMINAL POST | 1.79 |
| 1 | 3390B | SLEEVE - TERMINAL LINE POST | 13.80 |
| 1 | 3395G | 350-TL4 TERMINAL POST | 32.42 |

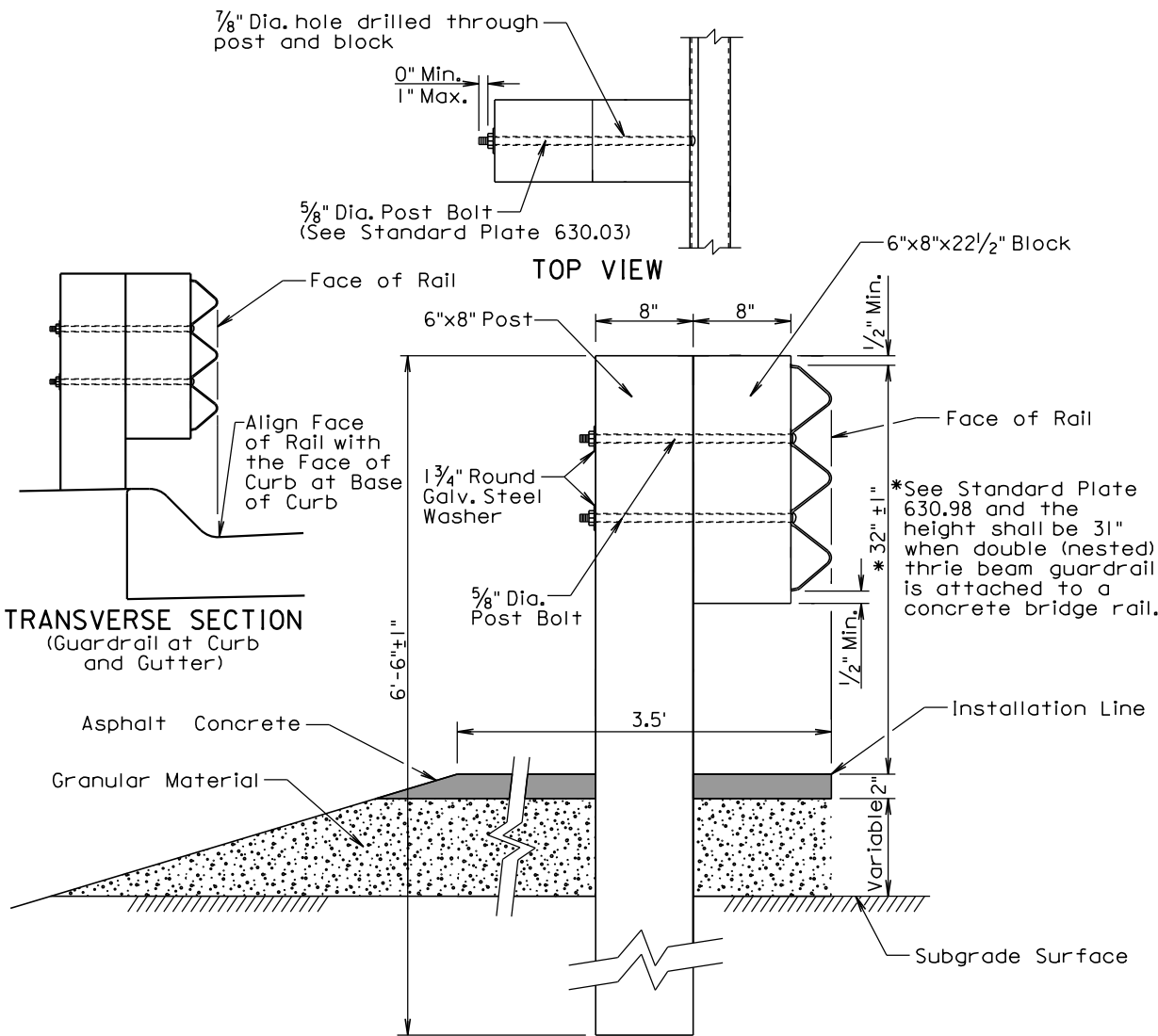
A technical diagram of a post and rail system. A vertical post is shown with a cylindrical base labeled "POST OPTION 1 SHOWN (CCT TERMINAL POST 4-9 IN CONCRETE)". The post has a series of horizontal rails attached to it. Labels with leader lines point to various parts: "FAR SIDE" points to the top rail; "5817G" points to a bracket on the top rail; "5818G" points to a bracket on the second rail from the top; "5819G" points to a bracket on the bottom rail; "NEAR SIDE" points to the right side of the rail assembly; "5815G" points to a bracket on the right side of the rail assembly; "5812G" points to a bracket on the right side of the rail assembly; and "TRAFFIC FACE" points to the right side of the rail assembly.

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PROJ. CASE-83_6-1


**TRINITY HIGHWAY
PRODUCTS, LLC**

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



GENERAL NOTES:

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

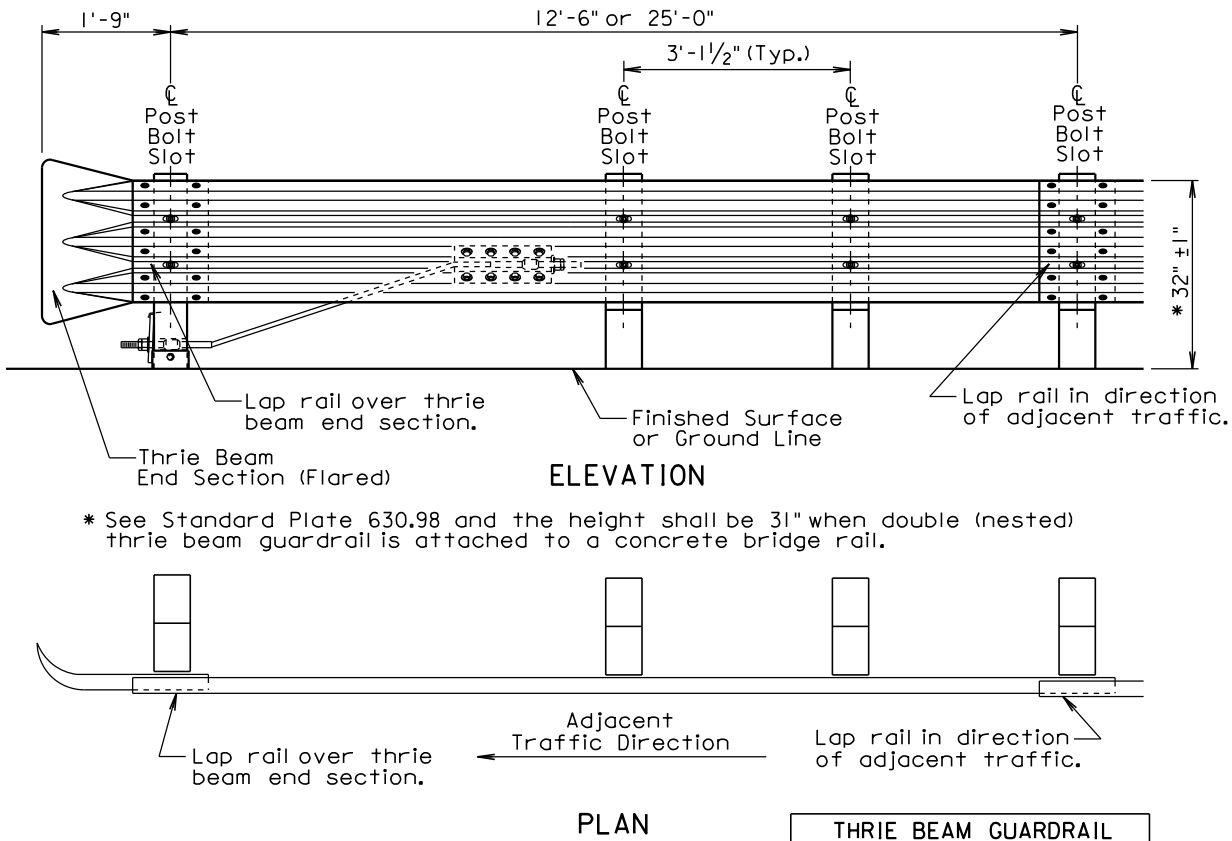
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline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

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

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

June 26, 2015

| | | | |
|-------------------------------|-----------------------|--|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | THRIE BEAM GUARDRAIL POST INSTALLATION | PLATE NUMBER 630.01 |
| | | | Sheet 1 of 1 |



GENERAL NOTES:

All thrie beam rail shall be Type 1.

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

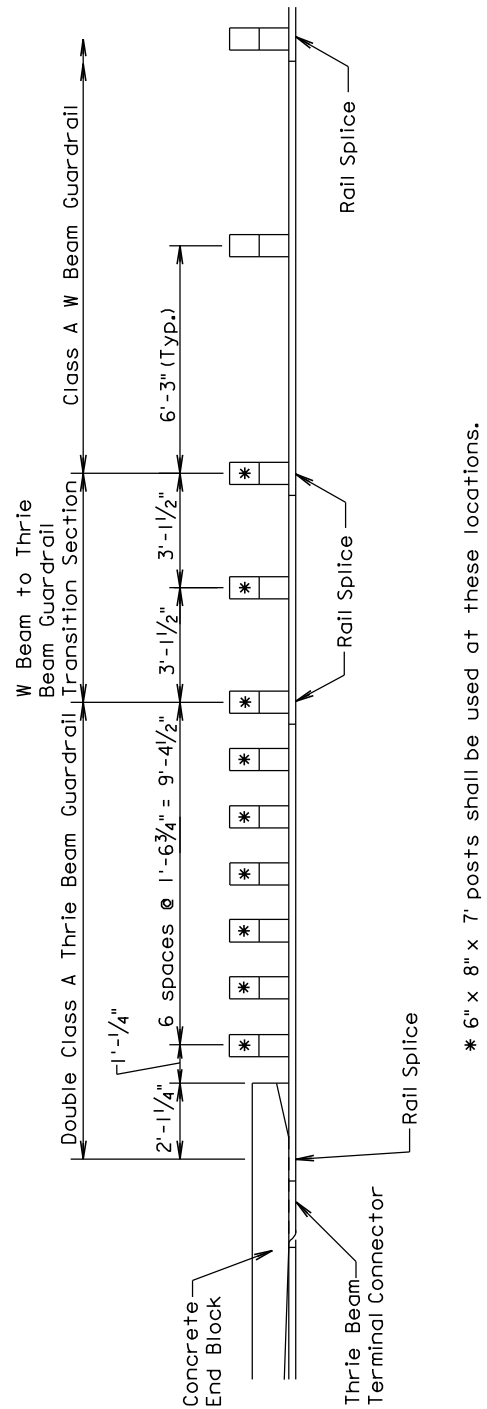
Thrie beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

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

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

June 26, 2015

| | | | |
|-------------------------------|-----------------------|-----------------------------------|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | THRIE BEAM GUARDRAIL INSTALLATION | PLATE NUMBER 630.02 |
| | | | Sheet 1 of 1 |



POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

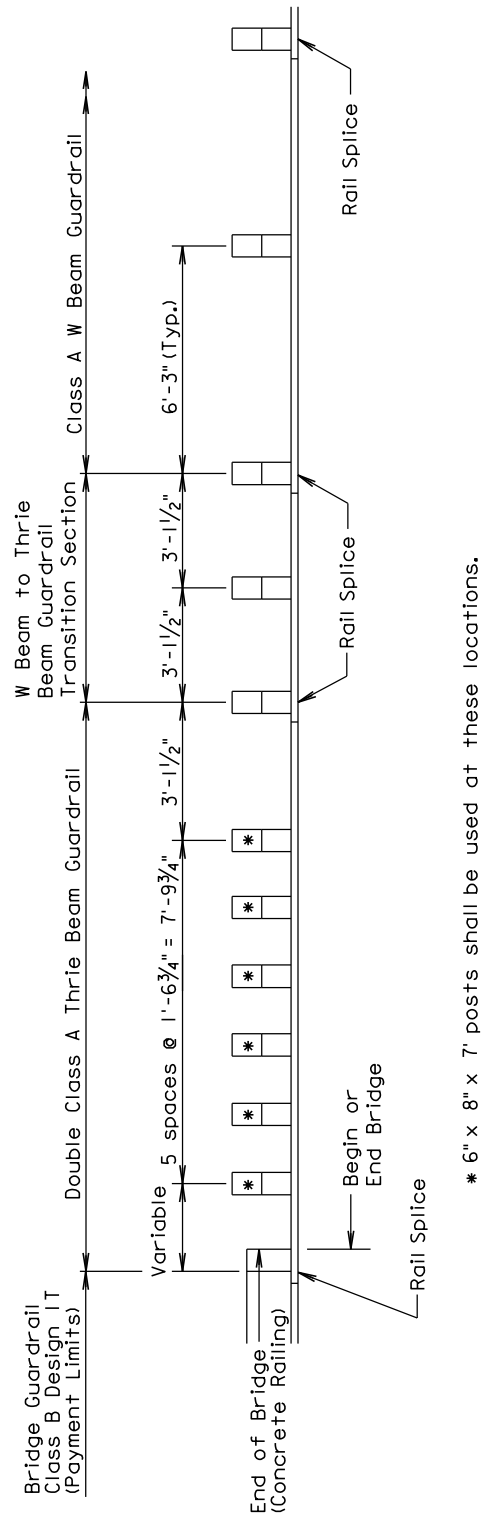
Published Date: 3rd Qtr. 2016

SDOT

POST SPACING ARRANGEMENT FOR
THRIE BEAM GUARDRAIL AT BRIDGE END

PLATE NUMBER
630.15

Sheet 1 of 1



POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

March 31, 2000

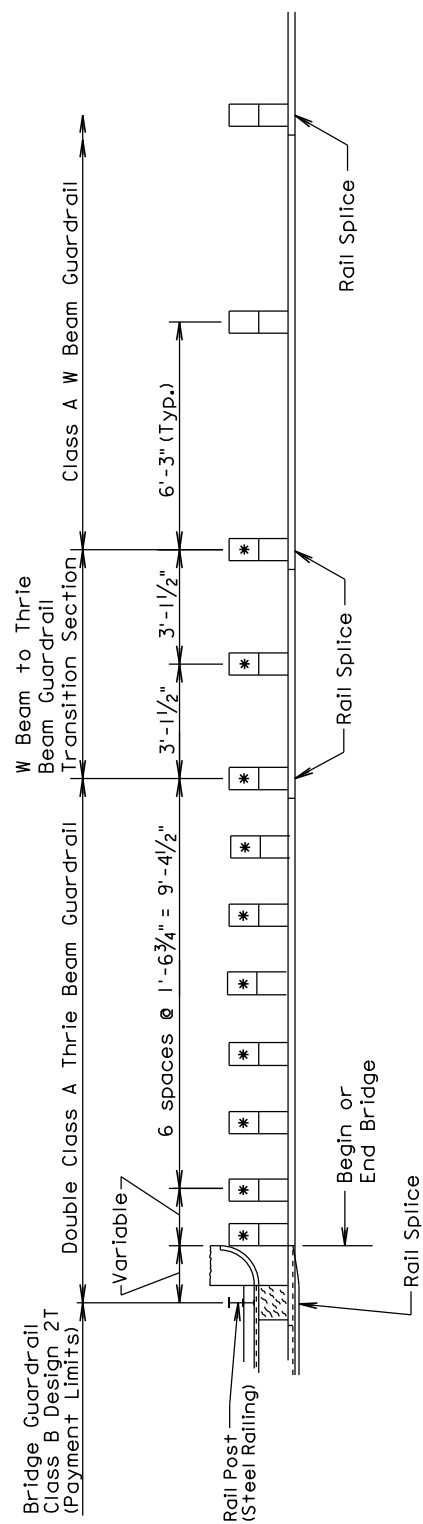
Published Date: 3rd Qtr. 2016

SDOT

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

PLATE NUMBER
630.20

Sheet 1 of 1



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

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

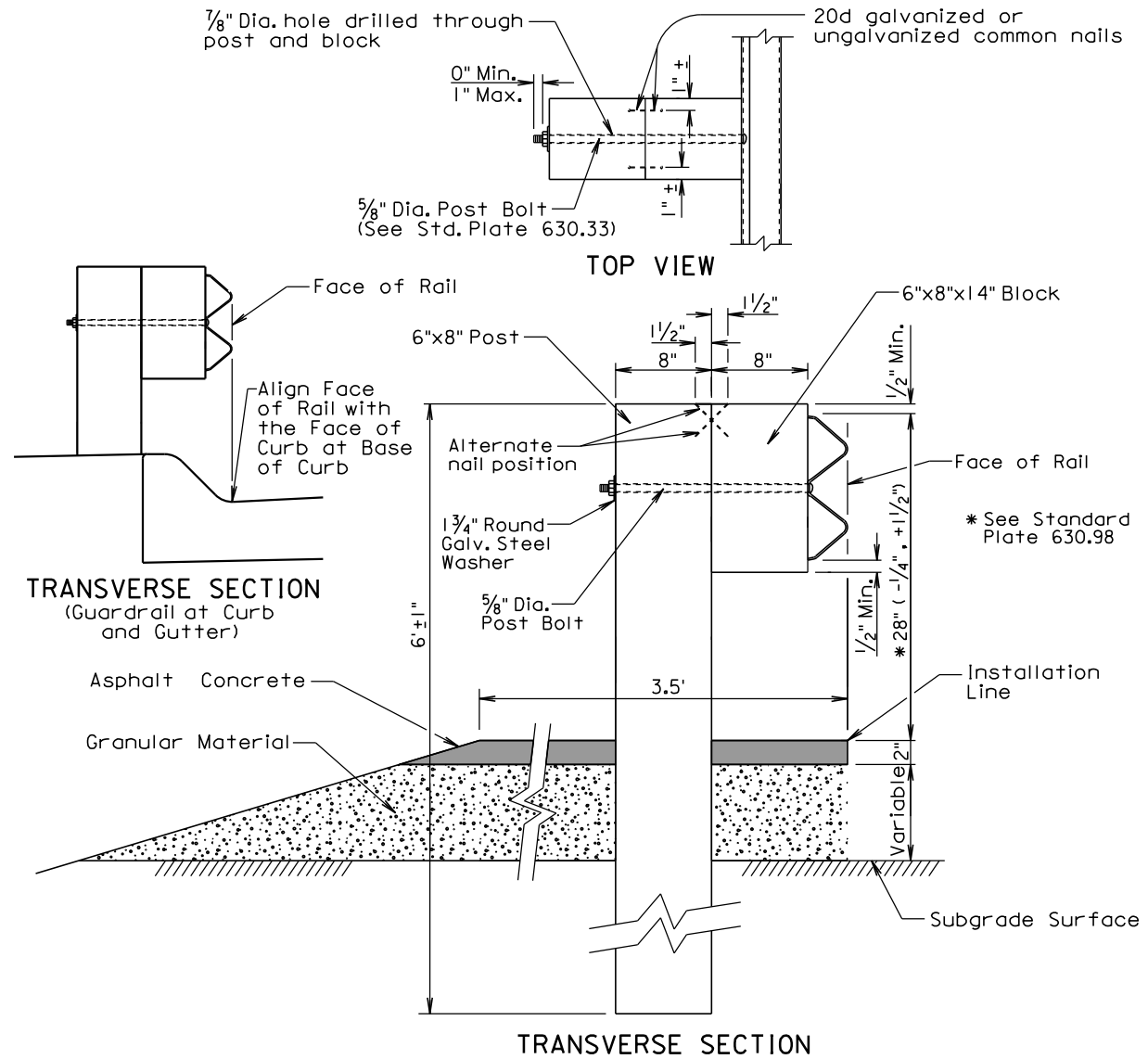
Published Date: 3rd Qtr. 2016

SDOT

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

PLATE NUMBER
630.21

Sheet 1 of 1



GENERAL NOTES:

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

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

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

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

June 26, 2015

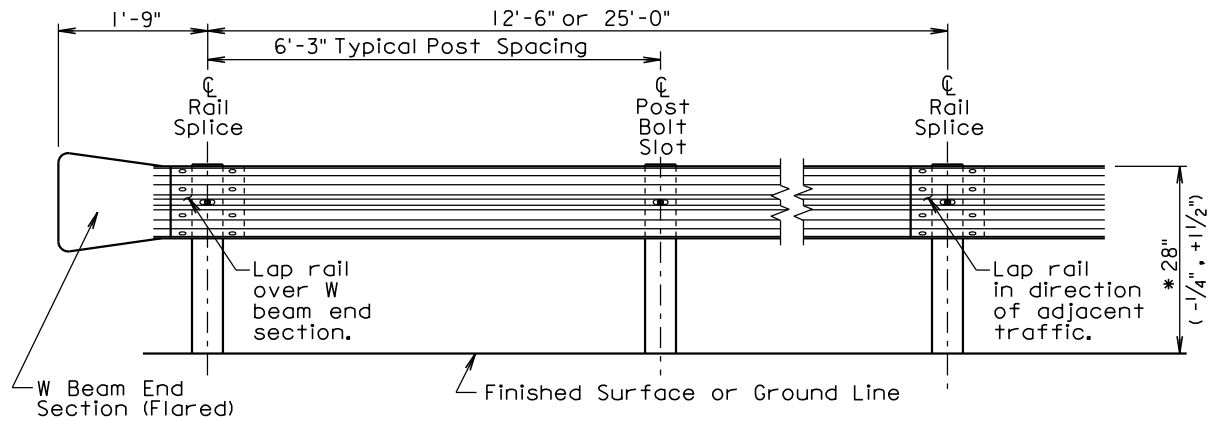
Published Date: 3rd Qtr. 2016

SDOT

W BEAM GUARDRAIL POST INSTALLATION

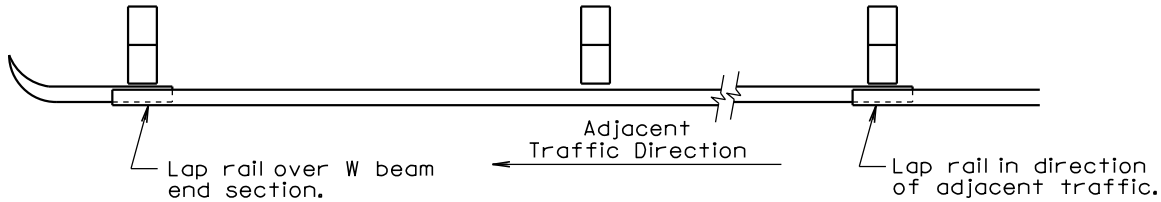
PLATE NUMBER
630.31

Sheet 1 of 1



ELEVATION

*See Standard Plate 630.98



PLAN

| W BEAM GUARDRAIL DEFLECTION CRITERIA | |
|--------------------------------------|--------------------|
| POST SPACING | MAXIMUM DEFLECTION |
| 6'-3" | 5'-0" |
| 3'-1 1/2" | 3'-9" |

For Informational Purposes Only

GENERAL NOTES:

All W beam rail shall be Type I.

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

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

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

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

June 26, 2015

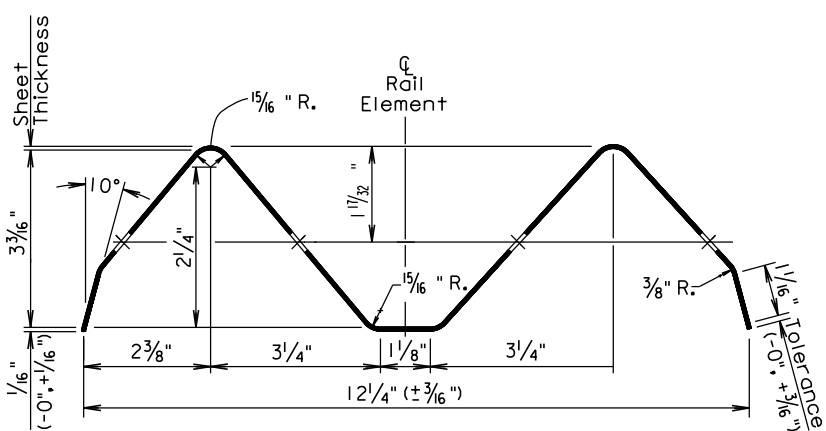
Published Date: 3rd Qtr. 2016

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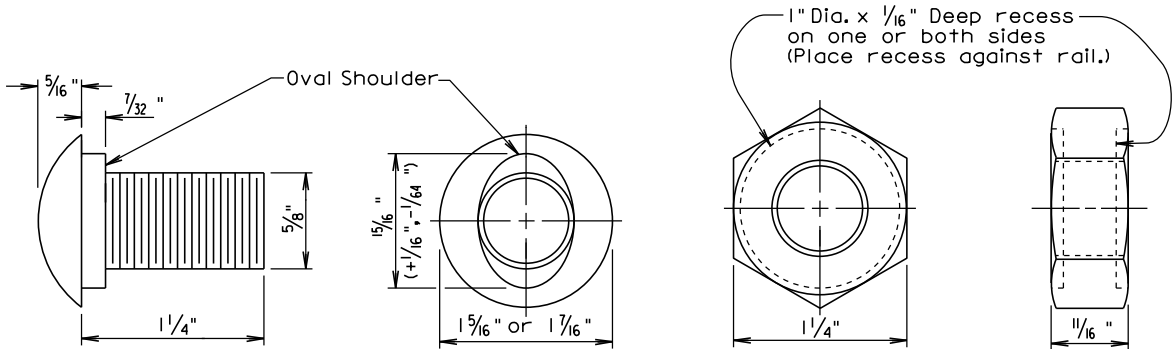
W BEAM GUARDRAIL INSTALLATION

PLATE NUMBER
630.32

Sheet 1 of 1

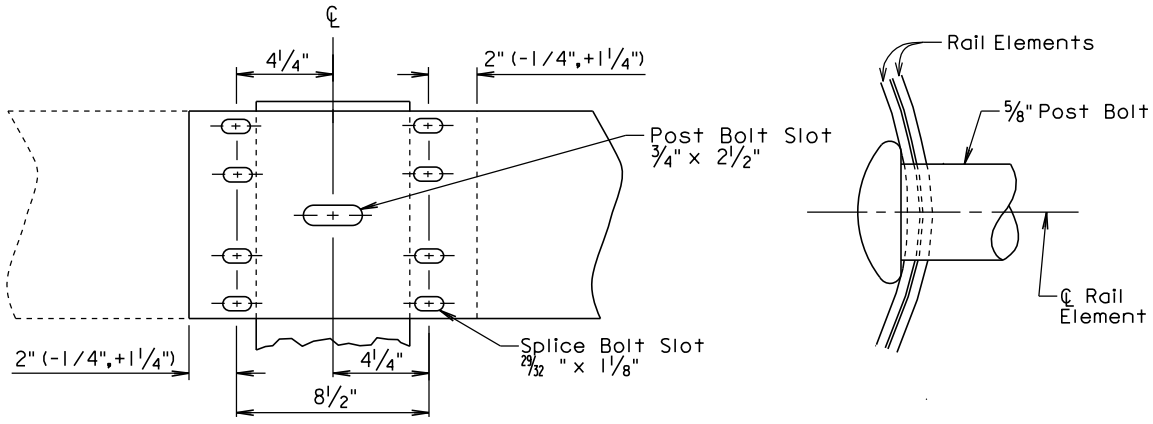


SECTION THROUGH W BEAM RAIL ELEMENT



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

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



RAIL SPLICE

December 23, 2004

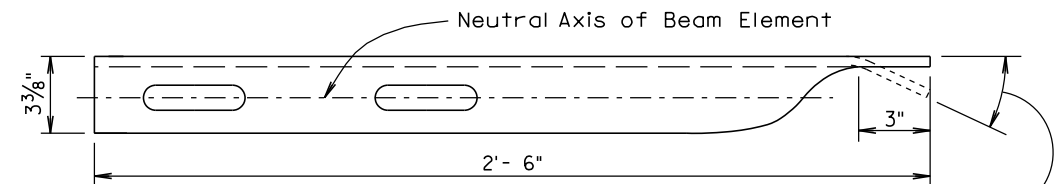
Published Date: 3rd Qtr. 2016

S
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T

W BEAM RAIL, RAIL SPLICE, AND HARDWARE

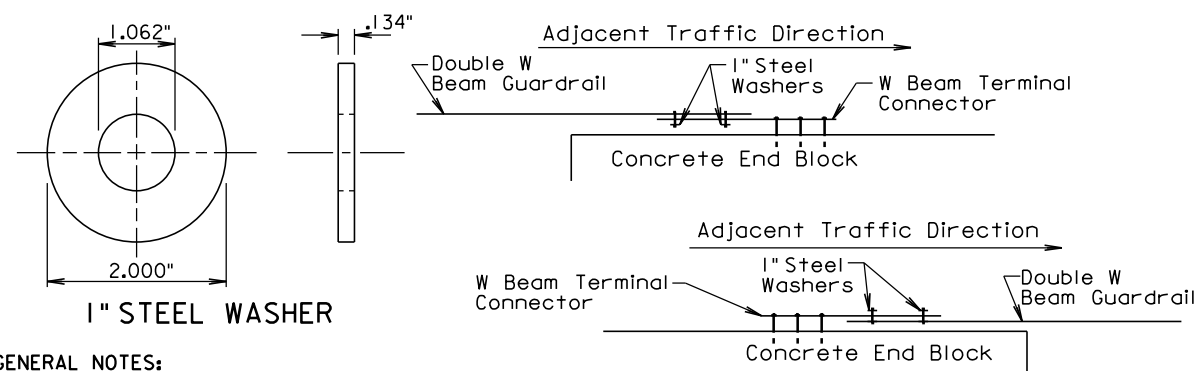
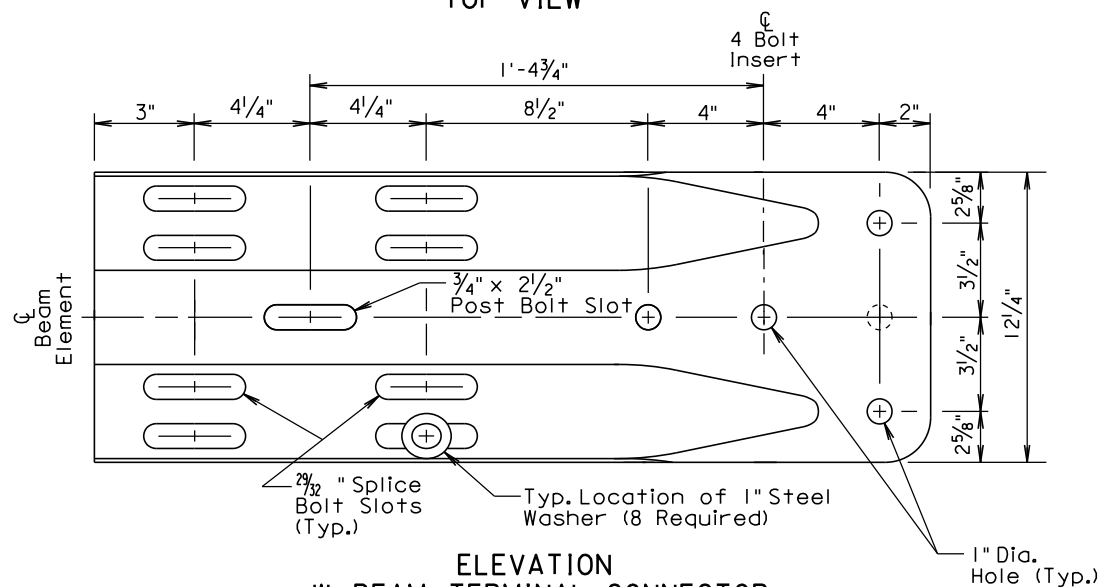
PLATE NUMBER
630.33

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



GENERAL NOTES:

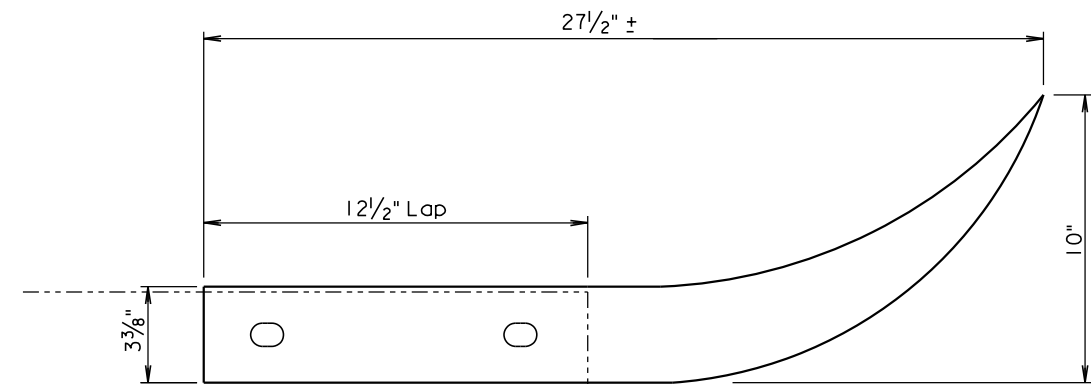
W Beam Terminal Connectors shall be 10 gauge.

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.

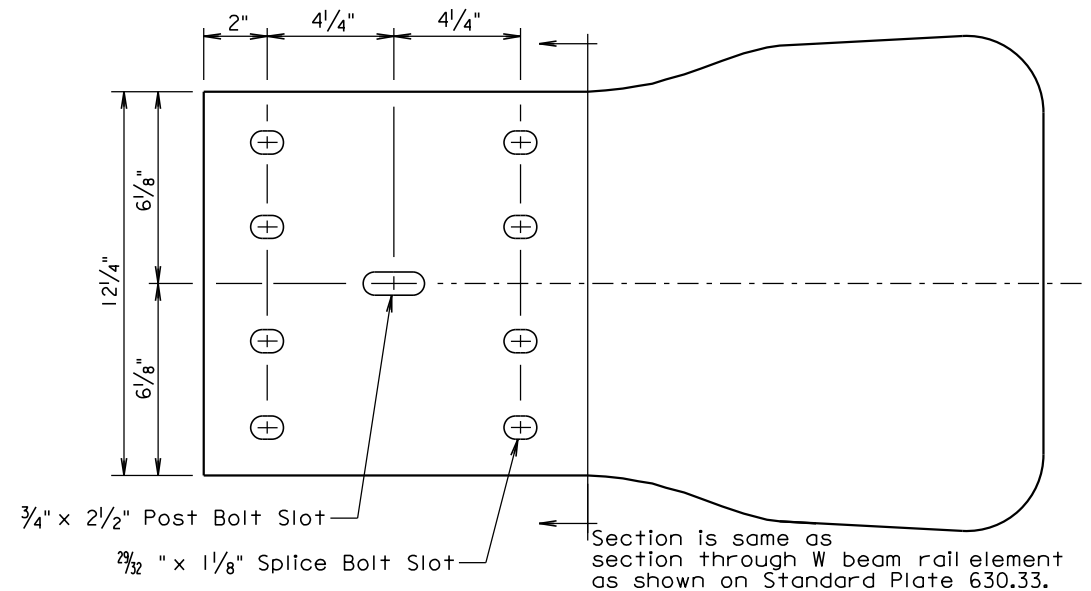
There will be no separate payment for furnishing and installing the W Beam Terminal Connector. All costs for the W Beam Terminal Connector shall be incidental to the contract unit price per foot for the respective "W Beam Guardrail" bid item.

September 14, 2001

| | | | |
|-------------------------------|-----------------------|--|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | W BEAM TERMINAL CONNECTOR AND 1" STEEL WASHER | PLATE NUMBER 630.35 |
| | | | Sheet 1 of 1 |



TOP VIEW



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: 3rd Qtr. 2016 | S D D O T | W BEAM END SECTION (FLARED) | PLATE NUMBER 630.40 |
| | | | Sheet 1 of 1 |

Published Date: 3rd Qtr. 2016

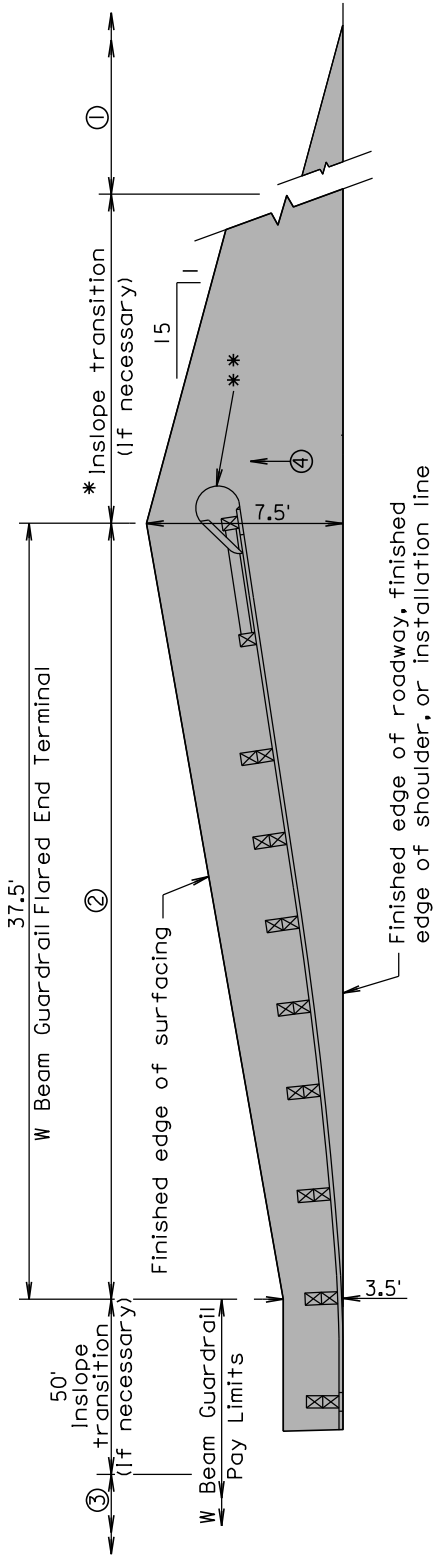
SDOT

EMBANKMENT AND SURFACING FOR
W BEAM GUARDRAIL FLARED END TERMINAL

PLATE NUMBER
630.45

Sheet 1 of 1

December 16, 2014



2" Asphalt concrete surfacing
with variable thickness granular material

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 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 Specifications for "Asphalt Concrete Composite."

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

Published Date: 3rd Qtr. 2016

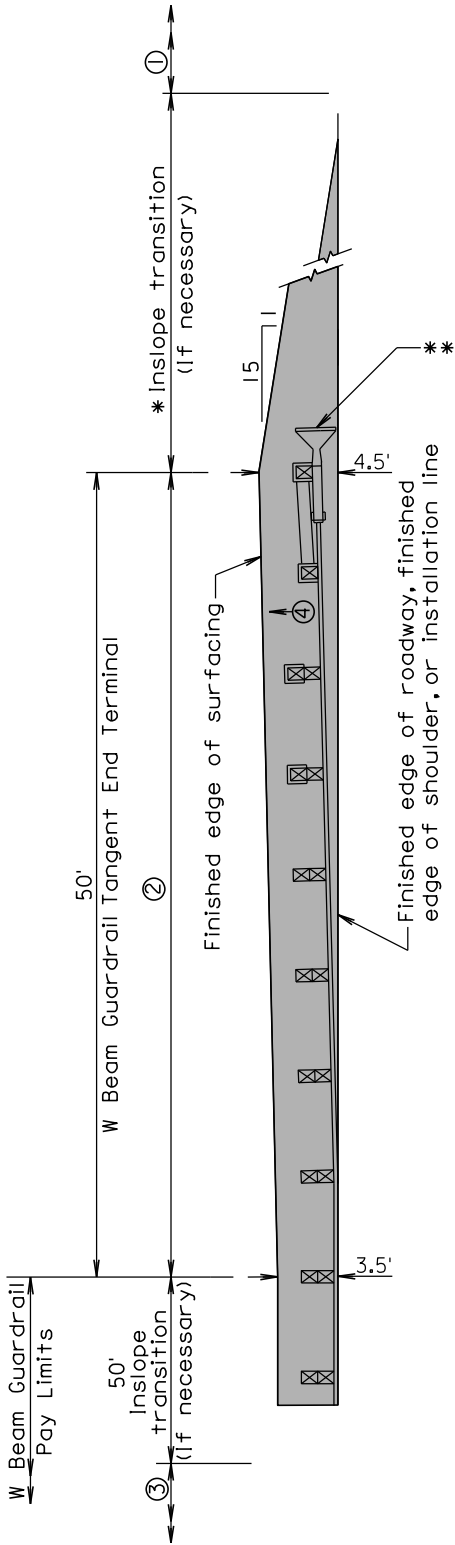
SDOT

EMBANKMENT AND SURFACING FOR
W BEAM GUARDRAIL TANGENT END TERMINAL

PLATE NUMBER
630.46

Sheet 1 of 1

December 16, 2014



2" Asphalt concrete surfacing
with variable thickness granular material

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

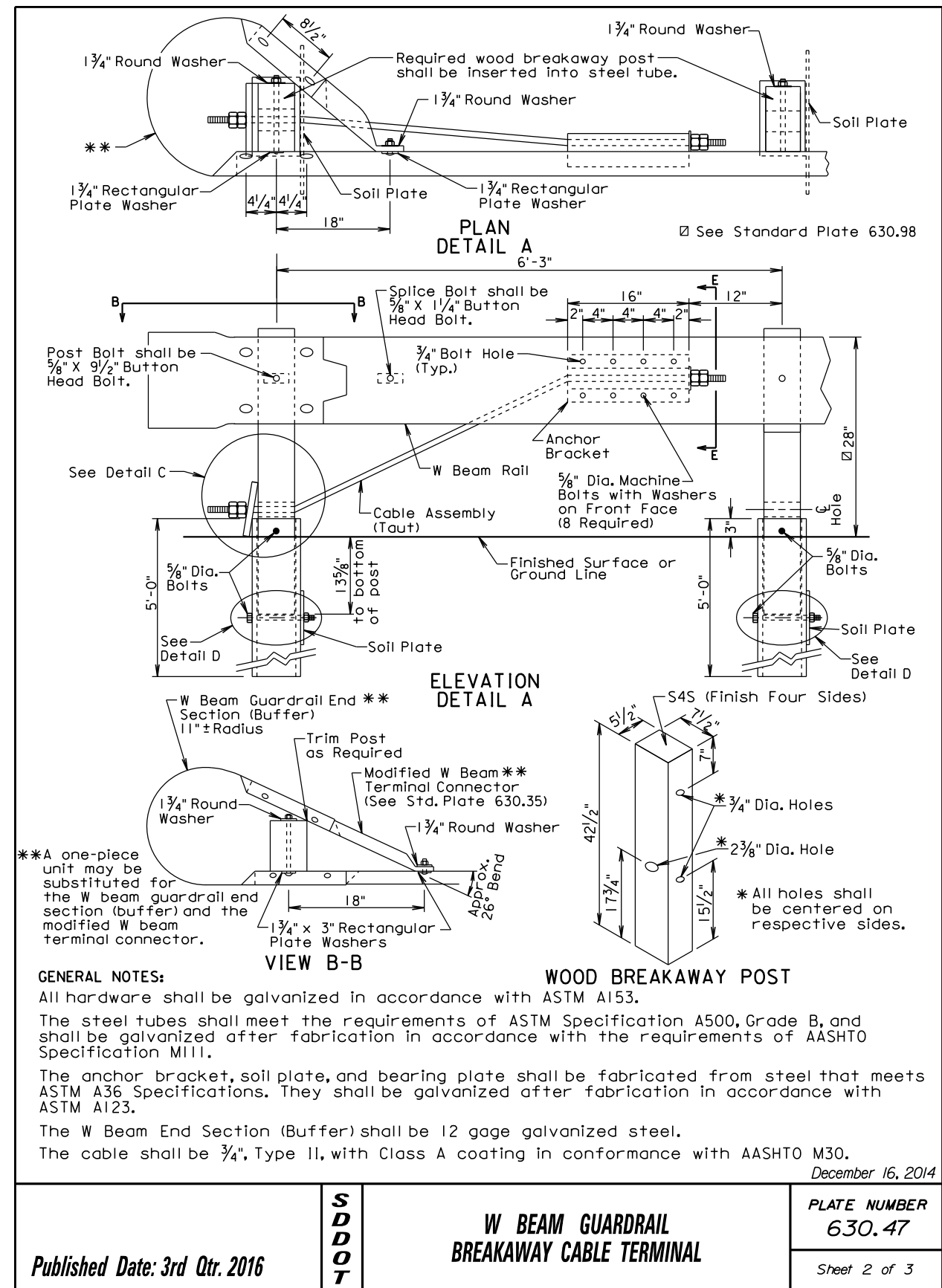
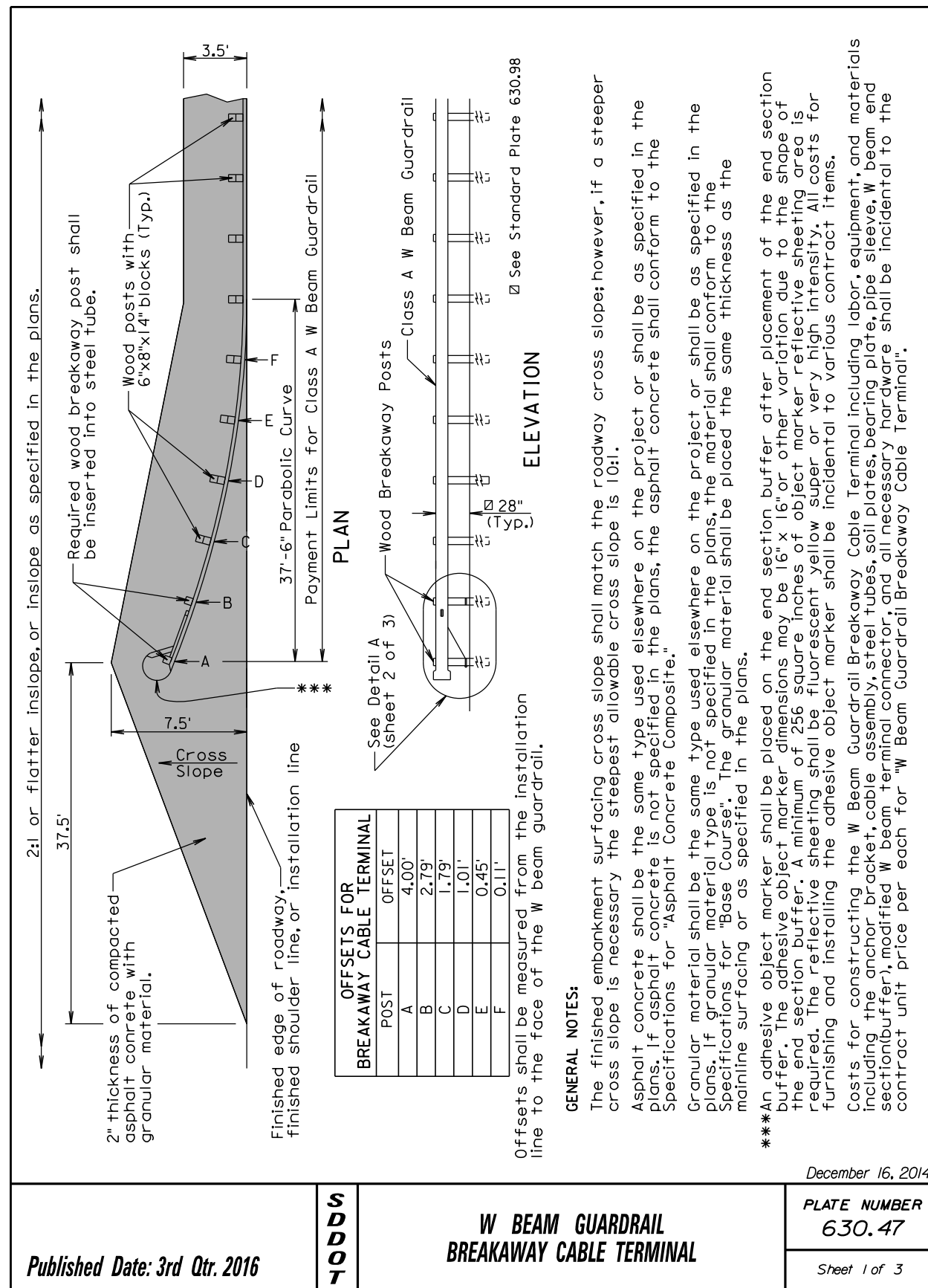
GENERAL NOTES:

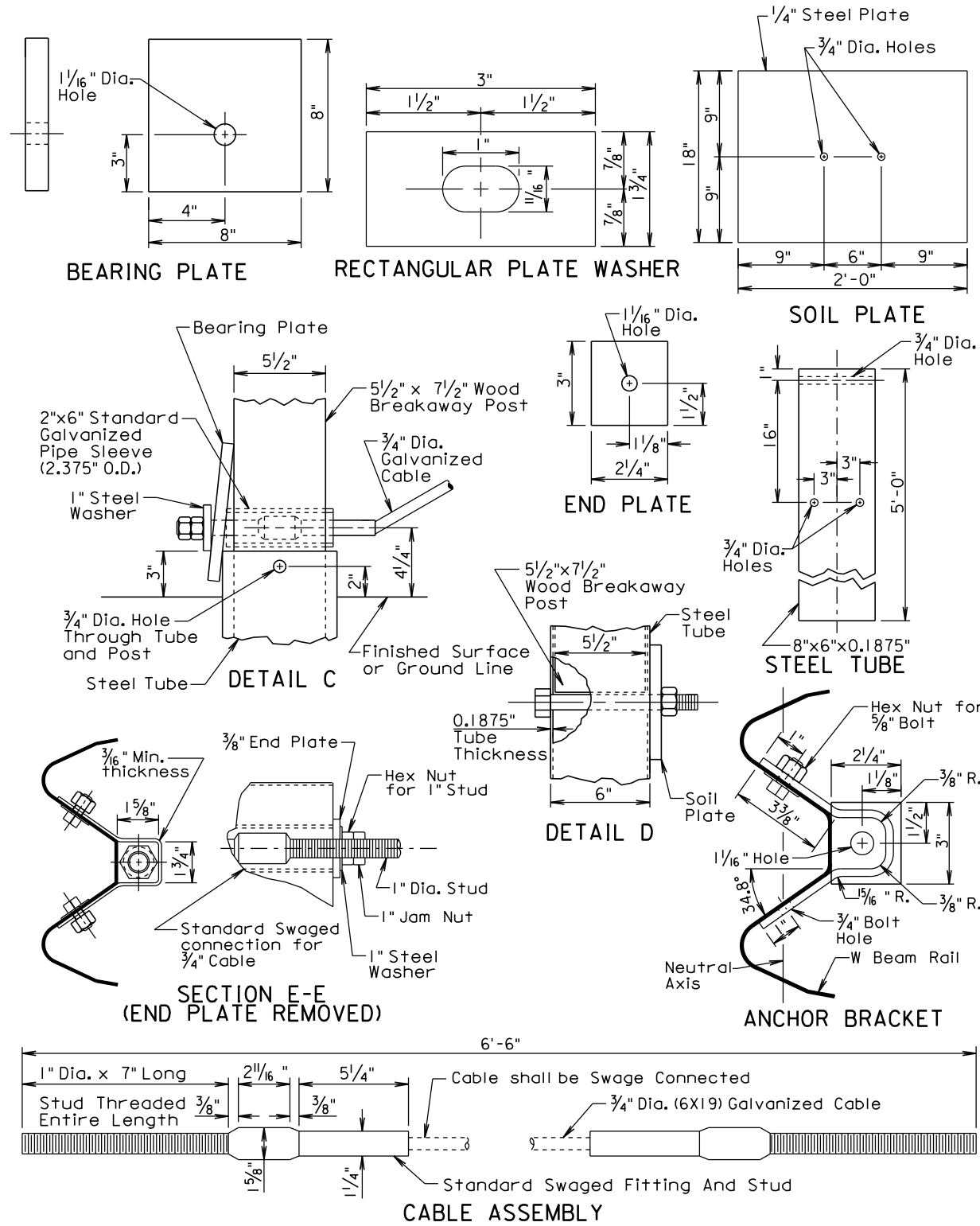
The W beam guardrail tangent end terminal shall be installed according to the manufacturer's installation instructions.

**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 Specifications for "Asphalt Concrete Composite."

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





December 16, 2014

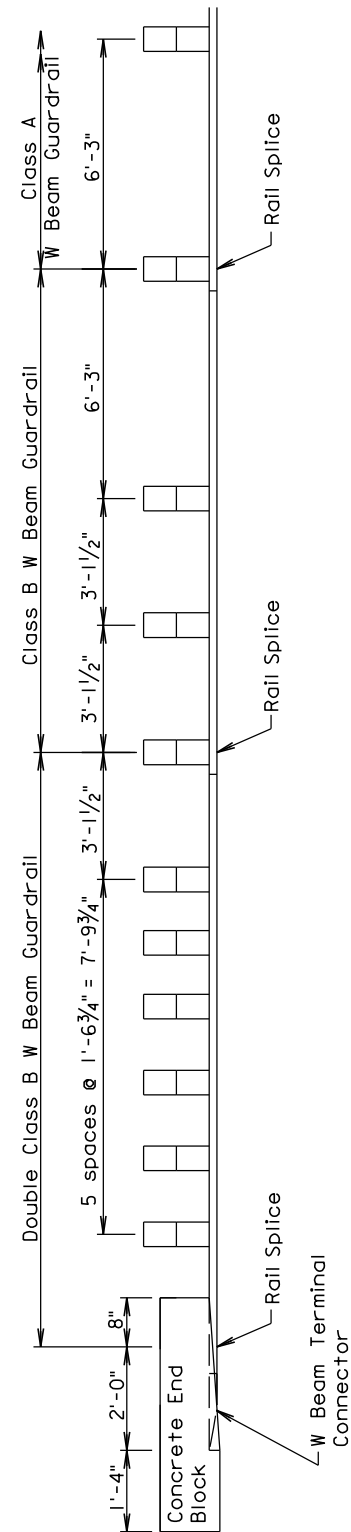
Published Date: 3rd Qtr. 2016

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**W BEAM GUARDRAIL
BREAKAWAY CABLE TERMINAL**

**PLATE NUMBER
630.47**

Sheet 3 of 3



March 31, 2000

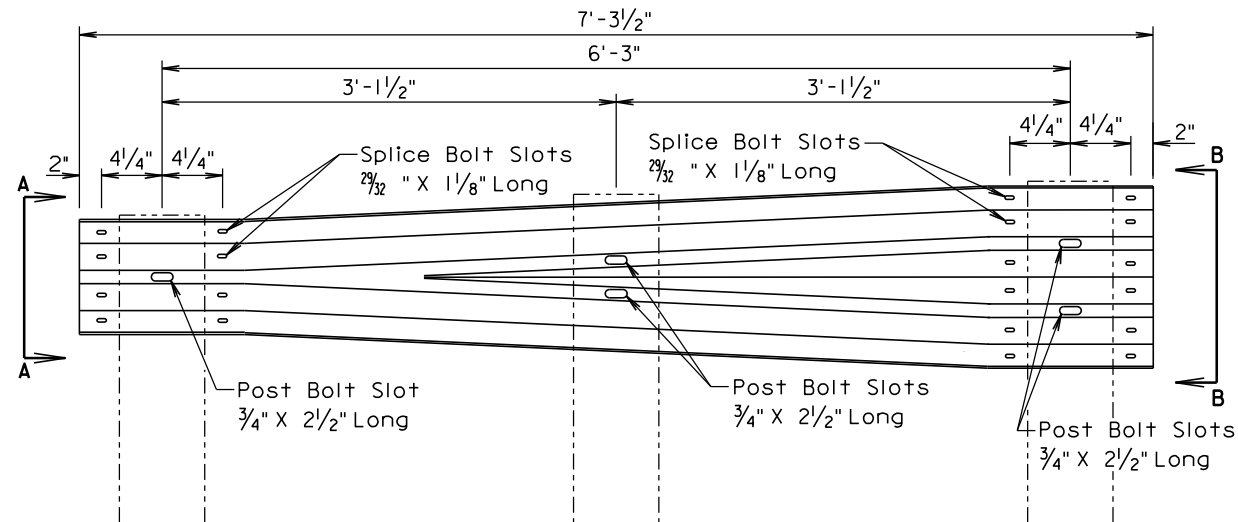
Published Date: 3rd Qtr. 2016

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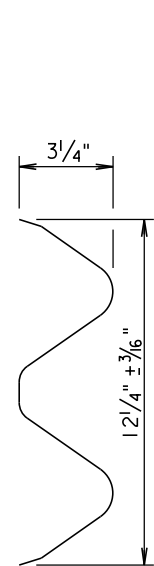
**POST SPACING ARRANGEMENT FOR
W BEAM GUARDRAIL AT BRIDGE END**

**PLATE NUMBER
630.50**

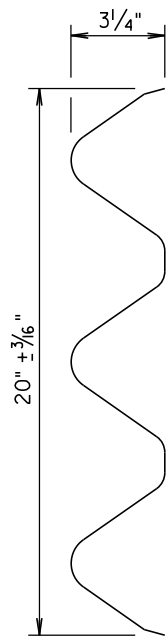
Sheet 1 of 1



ELEVATION



VIEW A-A



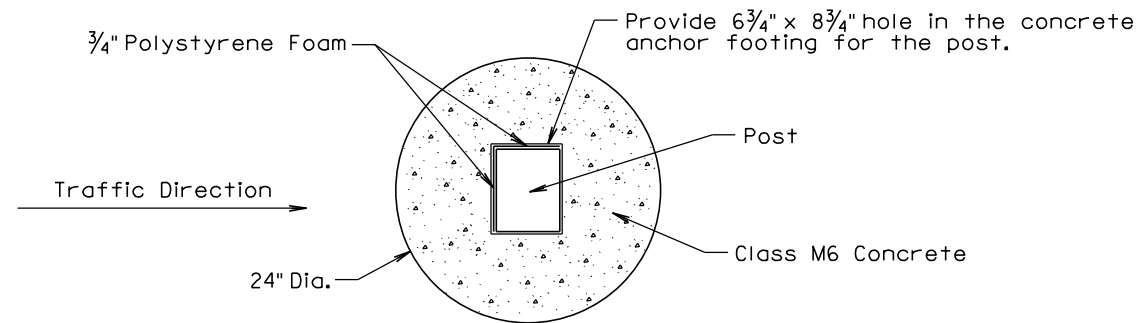
VIEW B-B

GENERAL NOTE:

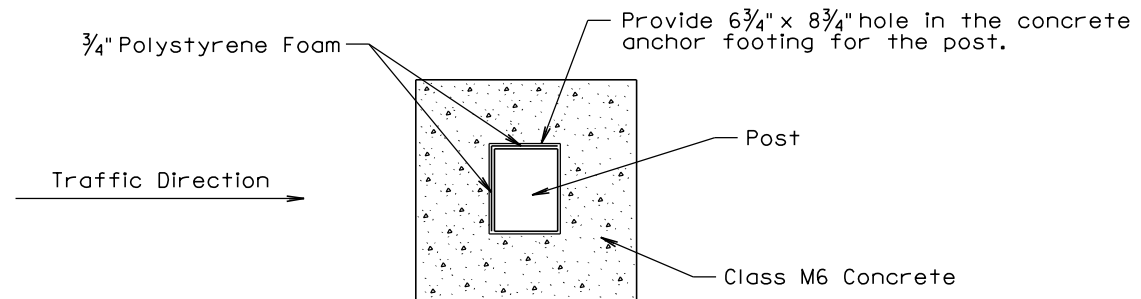
All costs for constructing the W Beam to Thrie Beam Guardrail Transition including labor, equipment, and materials including two posts, two blocks, W beam to thrie beam transition section, and hardware shall be incidental to the contract unit price per each for "W Beam to Thrie Beam Guardrail Transition".

March 31, 2000

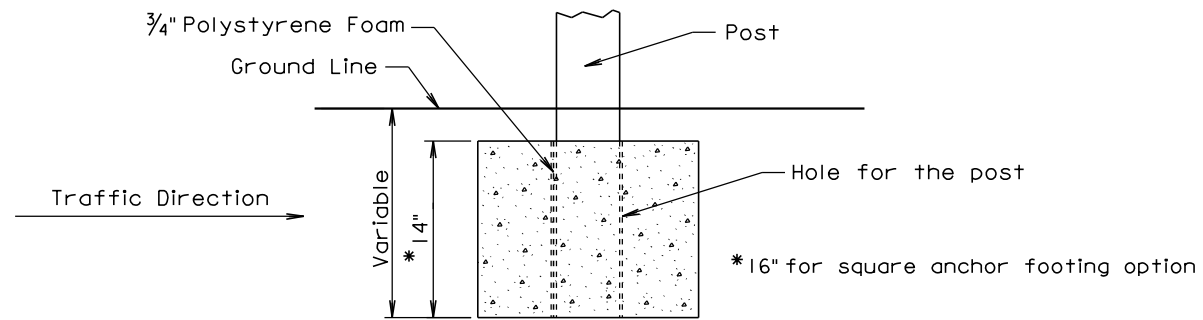
| | | | |
|-------------------------------|-----------------------|--|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION | PLATE NUMBER 630.82 |
| | | | Sheet 1 of 1 |



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.

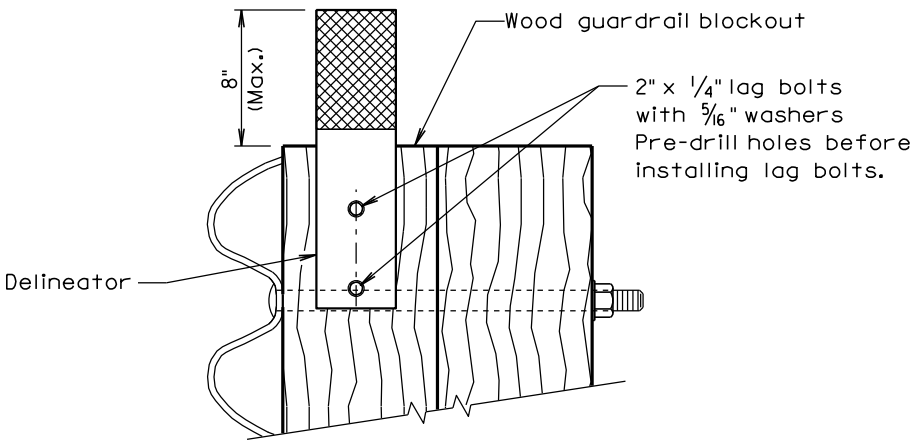
Concrete for the concrete anchor footing shall be Class M6.

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

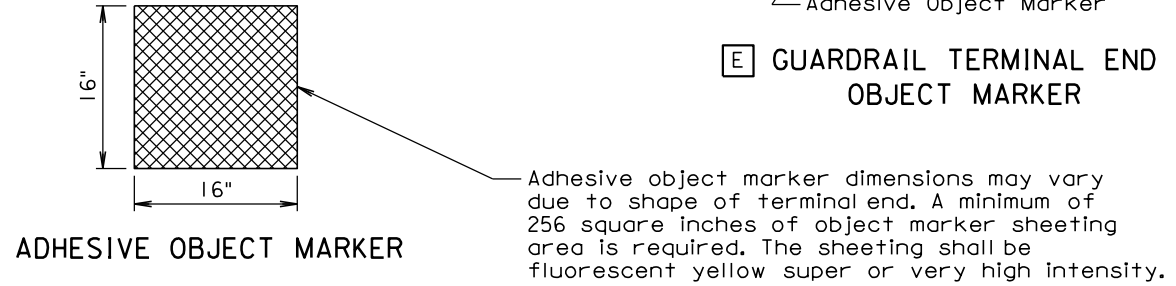
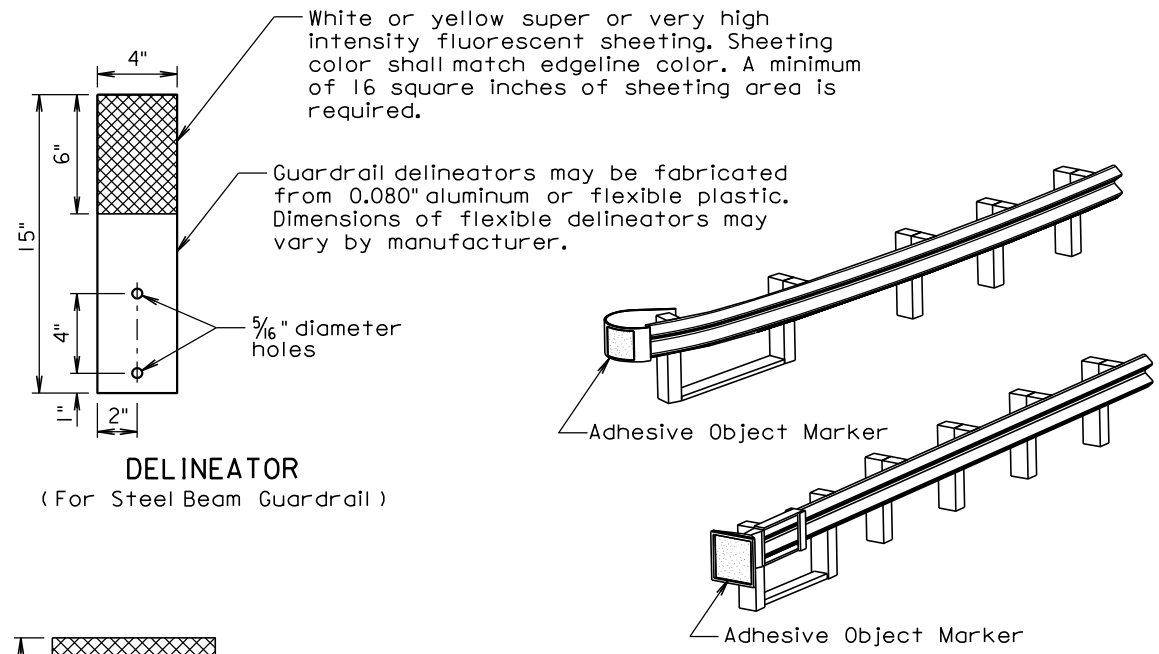
There will be no separate payment for furnishing and installing the concrete anchor footing for short guardrail post. All costs for concrete anchor footings shall be incidental to the contract unit price per foot for the respective "Thrie Beam or W Beam Guardrail" bid item.

March 31, 2000

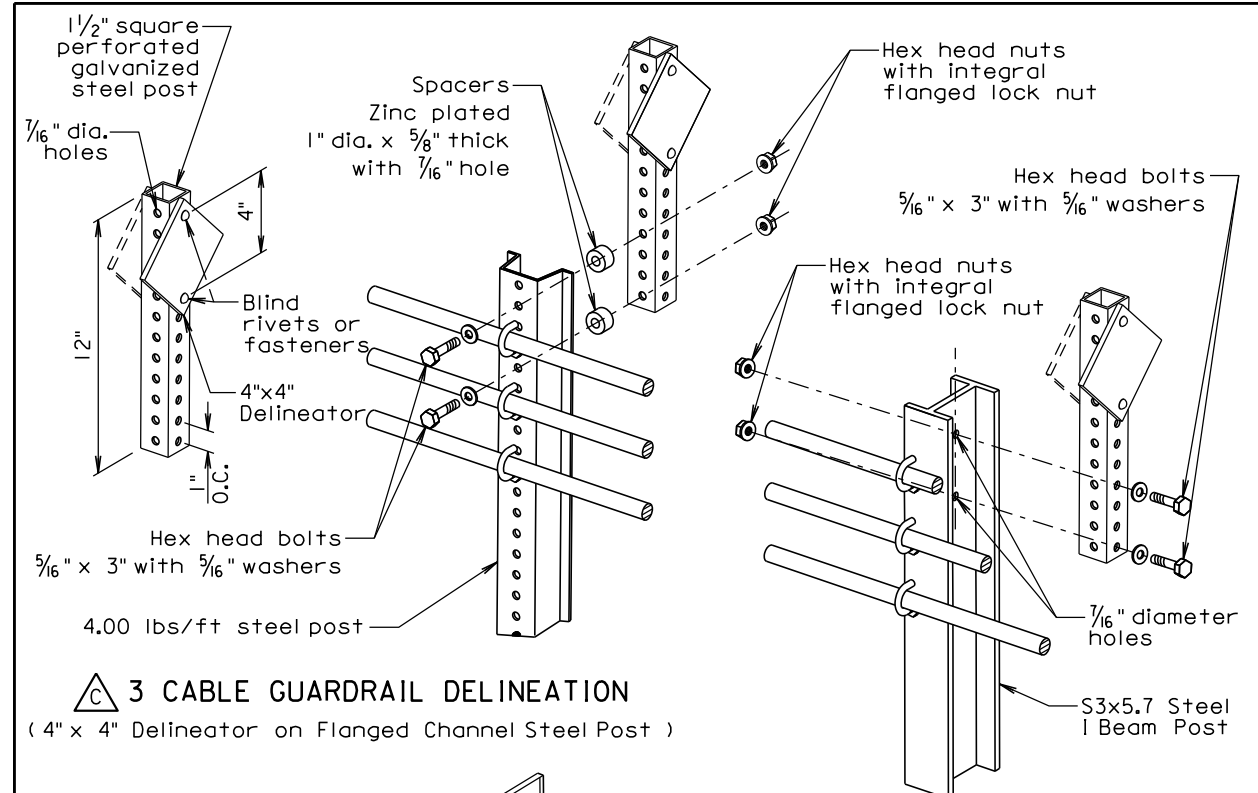
| | | | |
|-------------------------------|-----------------------|---|------------------------|
| Published Date: 3rd Qtr. 2016 | S D D O T | CONCRETE ANCHOR FOOTING FOR SHORT GUARDRAIL POST | PLATE NUMBER 630.84 |
| | | | Sheet 1 of 1 |



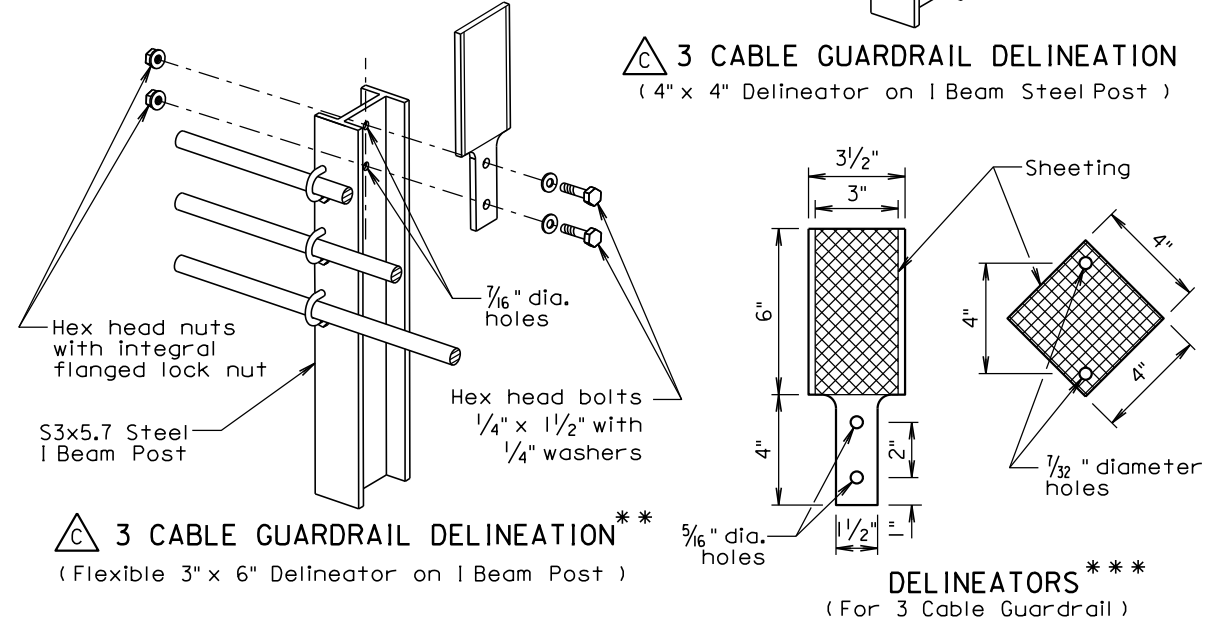
B STEEL BEAM GUARDRAIL DELINEATION



June 26, 2011



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



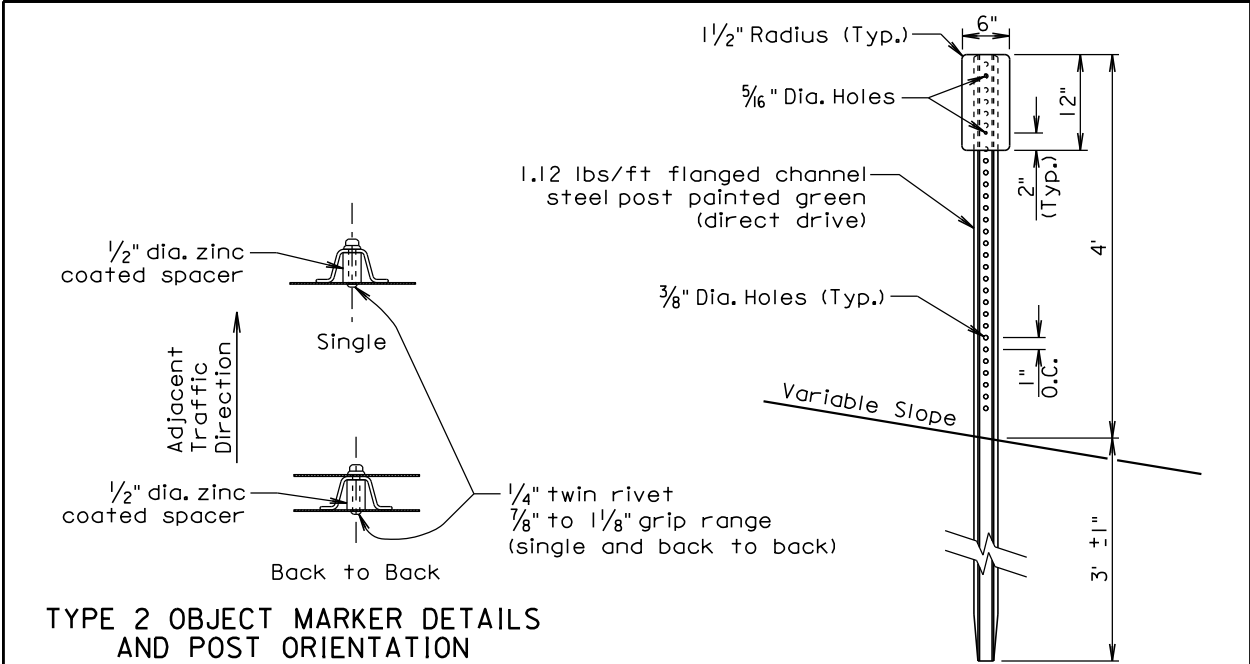
C 3 CABLE GUARDRAIL DELINEATION**
(Flexible 3" x 6" Delineator on I Beam Post)

DELINEATORS***
(For 3 Cable Guardrail)

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

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

June 26, 2011



TYPE 2 OBJECT MARKER DETAILS
AND POST ORIENTATION

(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: 3rd Qtr. 2016

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DELINEATION OF GUARDRAIL AT BRIDGES

PLATE NUMBER
632.40

Sheet 4 of 4

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

- Flagger
- Channelizing Device

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

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

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

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

The channelizing devices shall be drums or 42" cones.

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

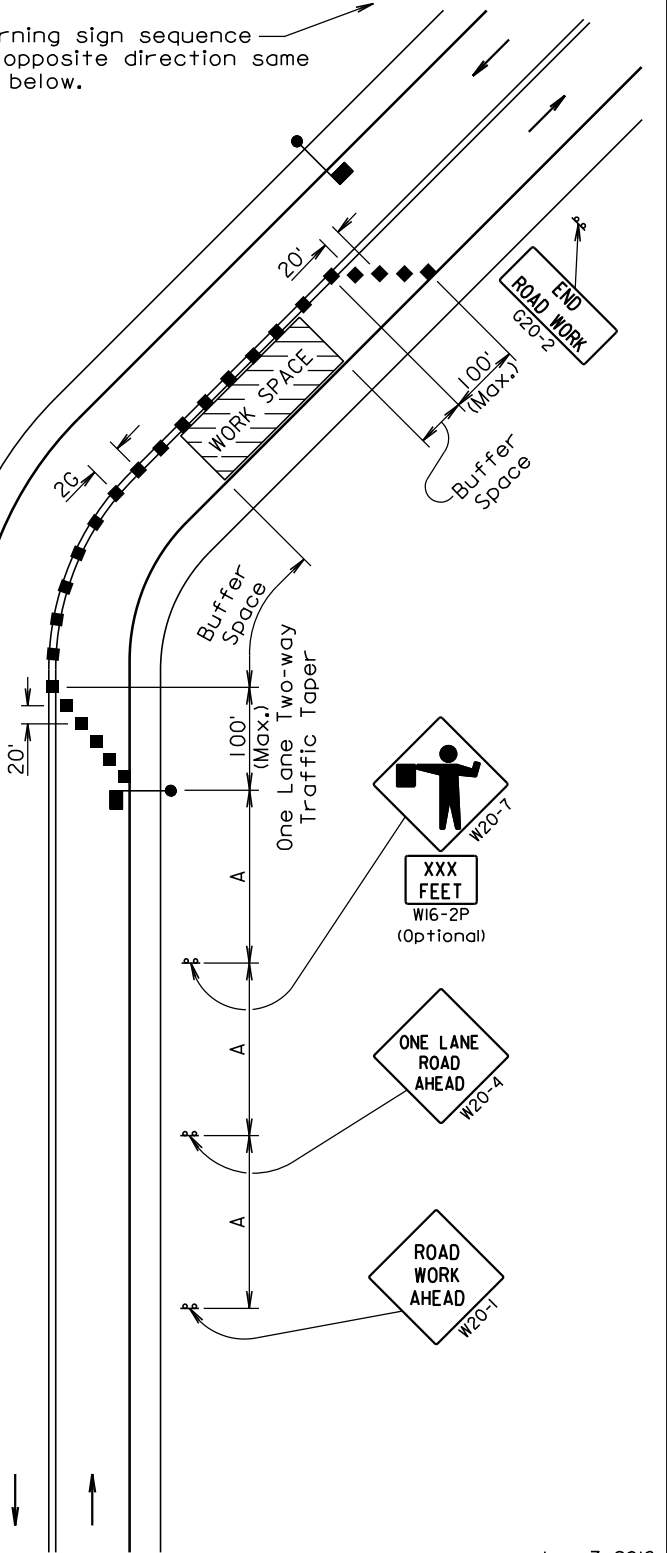
Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

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

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

Warning sign sequence in opposite direction same as below.

2-029
ROAD WORK
END



June 3, 2016

Published Date: 3rd Qtr. 2016

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GUIDES FOR TRAFFIC CONTROL DEVICES
LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER
634.23

Sheet 1 of 1

