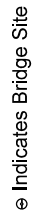


UPDATED 4-8-14



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GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

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.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

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.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

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.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

CONTRACT PROVISIONS

1. The Contract will become effective beginning July 1, 2016 and will expire on July 1, 2017.
2. Guardrail repairs will be limited to Interstate and State Highways located in the Aberdeen Region within the boundaries of Beadle, Brookings, Brown, Buffalo, Clark, Codington, Day, Deuel, Edmunds, Faulk, Grant, Hamlin, Hand, Hyde, Kingsbury, McPherson, Marshall, Moody, Roberts, and Spink Counties.
3. Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal shall apply to this contract. Guardrail repair shall conform to current Department of Transportation Standards or as directed by the Engineer.
4. The quantities shown on the SDDOT CONTRACT PROPOSAL are estimated quantities only, based upon previous years quantities. The actual amount of work accomplished may vary greatly from the quantities shown. There will be NO negotiation of contract unit prices for over-runs or under-runs.
5. All repair items shall be furnished new by the Contractor. Should some guardrail items be required that are not included in the contract, the Contractor will be paid for invoice cost of the item(s) plus shipping charges, taxes and ten percent for profit. Approval from the Area Engineer will be required prior to the purchase of non-contract item materials.

All costs to furnish and install new bolts, nuts, washers, nails, and other miscellaneous items shall be incidental to the various other contract items.

All damaged and replaced materials shall become the property of the Contractor for his disposal.

The Contractor shall remove broken stub posts protruding from the ground when installing new posts. Any holes left after replacement of the guardrail shall be backfilled with material furnished by the Contractor and compacted to the satisfaction of the Engineer.

6. Any damage to the roadway surfacing, embankment, vegetation, signing, etc. which occurs during guardrail repair operations shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.
7. The Contractor will be notified at such time as repairs are required. The Contractor shall complete all necessary repairs within twenty-one (21) calendar days after notification. For each day after the 21 calendar day limitation, the Contractor will be assessed liquidated damages at the rate of \$200.00 per day.

The Contractor shall inform the Engineer of the work schedule for guardrail repairs and any changes in the work schedule shall be provided per Section 5.11 of the Standard Specifications.

8. The Contract Items E through U listed under No. 9 Definition of Contract Items shall apply to 3 cable low tension guardrail, unless otherwise indicated.

To date there are only 2 installation locations of high tension cable guardrail installed within the geographic boundaries of this contract. These installations are Trinity Cass 4 Cable High Tension located on SD 25 in Day County and SD10 in Roberts County.

Supplier installation details and drawings for the high tension guardrail installation may be obtained by contacting Scott.Schneider@state.sd.us.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

9. Definition of Contract Items:

- A. **Mobilization 1:** Mobilization 1 (Aberdeen Area) shall include all costs of mobilization within the Aberdeen Area to and from the project and will be paid on a per each basis each time the Contractor is called in by the Area Engineer to perform guardrail accident damage repair. The Aberdeen Area includes the following counties: Brown, Day, Edmunds, Faulk, McPherson, and Marshall Counties.
- B. **Mobilization 2:** Mobilization 2 (Huron Area) shall include all costs of mobilization within the Huron Area to and from the project and will be paid on a per each basis each time the Contractor is called in by the Area Engineer to perform guardrail accident damage repair. The Huron Area includes the following counties: Beadle, Buffalo, Clark, Hand, Hyde, Kingsbury, and Spink Counties.
- C. **Mobilization 3:** Mobilization 3 (Watertown Area) shall include all costs of mobilization within the Watertown Area to and from the project and will be paid on a per each basis each time the Contractor is called in by the Area Engineer to perform guardrail accident damage repair. The Watertown Area includes the following counties: Brookings, Codington, Deuel, Grant, Hamlin, Moody and Roberts Counties.
- D. **Reset High Tension Cable Guardrail Terminal Post:** Reset High Tension Cable Guardrail Terminal Post shall include all costs to reset the terminal post if the cable was released after the post was struck. Posts need to be in good working condition. This contract item shall include miscellaneous hardware and tensioning cable.
- E. **Retension 3 Cable Guardrail:** Retension 3 Cable Guardrail shall include all costs to adjust the tension in a length of 3 Cable Guardrail. The tension shall be as shown on Standard Plate 629.01 (1 of 6). Measurement for payment will be per foot for all runs of 3 Cable Guardrail and shall include all 3 cables and both anchor ends that make up a run of 3 Cable Guardrail. Retension 3 Cable Guardrail may include cutting and shortening of cables at the anchors to allow for the proper tensioning. Payment will be center of anchor to center of anchor.
- F. **Retension High Tension 4 Cable Guardrail:** Retension High Tension 4 Cable Guardrail shall include all costs to adjust the tension in a length of High Tension 4 Cable Guardrail to manufacturers specifications. Measurement for payment shall be from center of anchor to center of anchor and shall include all 4 cables that make up a run of High Tension 4 Cable Guardrail. Retension High Tension 4 Cable Guardrail shall include cutting and shortening of cables at the anchors to allow for the proper tensioning.
- G. **Repair 3 Cable Guardrail Slip Base Anchor Assembly:** Repair 3 Cable Guardrail Slip Base Anchor Assembly shall include full compensation for repair of the damaged Slip Base Anchor Assembly. This work will be performed if it is determined that the Slip Base Anchor Assembly can be repaired without total footing removal. The work will consist of coring a 12" diameter section into the existing footing, centered over the existing slip base anchor stub post, to a depth of 22". The core will then be broke off and disposed of. The sides of the hole in the footing shall be roughened to the satisfaction of the Engineer. A rapid-setting, non-shrink, non-metallic grout shall be used (in accordance with the manufacturer's recommendations) to anchor the new slip base anchor stub post in the footing. The grout shall reach a compressive strength of over 5000 PSI.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

- H. **3 Cable Guardrail End Post:** 3 Cable Guardrail End Post shall include all costs for removal of damaged end post and installation of 3 cable guardrail end post. 3 Cable Guardrail End Post shall also include a new end post cap. All costs incurred for removal and replacement of the existing cable on the new post shall be incidental to this contract item.
- I. **3 Cable Guardrail Intermediate Post:** 3 Cable Guardrail Intermediate Post shall include all costs for removal of damaged post and installation of 3 cable guardrail intermediate line post. All costs incurred for removal and replacement of the existing cable on the new post, including J Hook Bolts shall be incidental to this contract item.
- J. **3 Cable Guardrail Slip Base Anchor Post:** 3 Cable Guardrail Slip Base Anchor Post shall include all costs for removal of damaged post and installation of 3 cable guardrail slip base anchor post. All costs incurred for removal and replacement of the existing cable on the new post, shall be incidental to this contract item.
- K. **3 Cable Guardrail Post, Winter:** 3 Cable Guardrail Post, Winter shall include all costs for removal of the damaged post and installation of cable guardrail post when there is in excess of one foot of frozen ground at the work site. When this condition exists, the contract unit price per each for "3 Cable Guardrail Post, Winter" will be the pay unit rather than the contract unit price per each for "3 Cable Guardrail Intermediate Post" and/or "3 Cable Guardrail End Post". The Contractor shall furnish any J Hook Bolts needed as shown on Standard Plate 629.01 (5 of 6).
- All costs incurred for removal and replacement of the existing cable on the new post, including J Hook Bolts shall be incidental to this contract item.
- L. **Drive Down 3 Cable Guardrail Post:** Drive Down 3 Cable Guardrail Post shall include all costs for adjusting the height of a Cable Rail Post. All costs to disassemble the cable rail to do this work shall be incidental to this contract item.
- M. **Reset 3 Cable Guardrail Post:** Reset 3 Cable Guardrail Post shall include all costs incurred for the realignment and/or removal and resetting of a cable guardrail post to properly align cable guardrail section. The Contractor shall furnish any J Hook Bolts needed as shown on Standard Plate 629.01 (5 of 6).
- Work under this item may require straightening of in place bent cable guardrail posts to bring them into alignment with cable guardrail section. Payment for "Reset 3 Cable Guardrail Post" will be the same whether in frozen or unfrozen ground. All costs incurred for removal and replacement of the existing cable on the new post shall be incidental to this item.
- N. **Cable Anchor Bracket:** Cable Anchor Bracket shall include furnishing and installing the Cable Anchor Bracket as shown on Standard Plate 629.01 (3 of 6).
- O. **Cable Splice:** Cable Splice shall include all costs incurred for cutting existing cable and for furnishing and installing the necessary cable splice. This contract item shall be used for low tension and high tension cable guardrail.
- P. **3 Cable Guardrail J Hook Bolt:** 3 Cable Guardrail J Hook Bolt shall include furnishing & installing J hook bolts when no other work is required to the 3 cable guardrail other than missing or broken J hook bolts.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

- Q. **Steel Turnbuckle Cable End Assembly:** Steel Turnbuckle Cable End Assembly shall include all costs for furnishing and installing the Steel Turnbuckle Cable End Assembly as shown on Standard Plate 629.01 (4 of 6).
- R. **Turnbuckle Assembly:** Turnbuckle Assembly shall include all costs for furnishing and installing the Turnbuckle Assembly on high tension cable guardrail.
- S. **Spring Cable End Assembly with Turnbuckle:** Spring Cable End Assembly with Turnbuckle shall include all costs for furnishing and installing the Spring Cable End Assembly with Turnbuckle as shown on Standard Plate 629.01 (4 of 6).
- T. **W Beam to 3 Cable Transition Bracket:** W Beam to 3 Cable Transition Bracket shall include all costs incurred for removing the damaged transition bracket and installing a transition bracket in accordance with the details on Standard Plates 629.05 & 629.15.
- U. **3 Cable Guardrail End Post Cap:** 3 Cable Guardrail End Post Cap shall include all costs for furnishing and installing an end post cap as shown on Standard Plate 629.01 (6 of 6).
- V. **High Tension 4 Cable Guardrail Post:** High Tension 4 Cable Guardrail Post shall include all costs for removal of damaged post and installation of a High Tension 4 Cable Guardrail Post. All costs incurred for removal and replacement of the existing cable on the new post, including hardware shall be incidental to this contract item.
- W. **High Tension 4 Cable Guardrail Post and Sleeve:** High Tension 4 Cable Guardrail Post and Sleeve shall include all costs for removal of damaged post and sleeve, and installation of a High Tension 4 Cable Guardrail Post and Sleeve. All costs incurred for removal and replacement of the existing cable on the new post, including hardware shall be incidental to this contract item.
- X. **High Tension 4 Cable Guardrail Sleeve:** High Tension 4 Cable Guardrail Sleeve shall include all costs for removal of damaged sleeve and installation of a High Tension 4 Cable Guardrail Sleeve. All costs incurred for removal and replacement of the existing post and of the existing cable on the post, including hardware shall be incidental to this contract item.
- Y. **High Tension Cable Guardrail Terminal Post:** High Tension Cable Guardrail Terminal Post shall include all costs for removal of damaged terminal post and installation of a High Tension Cable Guardrail Terminal Post. All costs incurred for removal and replacement of the existing cable on the new post, including reflective sheeting, hardware and tensioning cable shall be incidental to this contract item.
- Z. **Hardware For High Tension Cable Attachment To Terminal Post:** Hardware For High Tension Cable Attachment To Terminal Post shall be used for furnishing and installing the hardware for a high tension cable guardrail terminal post. This item is used for a typical repair if a high tension cable guardrail terminal post is struck and releases the cable(s). Use this item when the terminal post is in good condition and only new hardware and resetting the terminal post is necessary. Payment includes cost for furnishing and installing hardware for the high tension cable attachment to terminal post, resetting terminal post, labor, equipment, and incidentals.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

- AA. **Hardware For High Tension Cable Attachment To Post:** Hardware For High Tension Cable Attachment To Post shall be used for furnishing and installing the hardware for a high tension cable attachment to post. This item is used for a typical repair if the hardware was damaged by a snow plow or other crash. Use this item when the post is in good condition and only new hardware is necessary. The quantity and unit for the bid item is one "Each" for one attachment, i.e. if several attachments are damaged on a high tension 4 cable guardrail post then the quantity would be more than 1. Payment includes cost for furnishing and installing hardware for the high tension cable attachment to post, labor, equipment, and incidentals.
- BB. **High Tension Cable Guardrail Cable Strap:** High Tension Cable Guardrail Cable Strap shall include all costs for removal of damaged/missing strap and installation of a High Tension Cable Guardrail Cable Strap. High Tension Cable Guardrail Cable Strap contract item will not be paid for when a new guardrail post is paid for as the new guardrail post shall include the strap. This item is specific to products from Trinity known as the CASS high tension cable barrier.
- CC. **High Tension Cable Guardrail Cable Spacer:** High Tension Cable Guardrail Cable Spacer shall include all costs for removal of damaged spacer and installation of a High Tension Cable Guardrail Cable Spacer. High Tension Cable Guardrail Cable Spacer contract item will not be paid for when a new guardrail post is paid for as the new guardrail post shall include the spacer. This item is specific to products from Trinity known as the CASS high tension cable barrier.
- DD. **Cable:** This contract item shall include furnishing and installing cable for both low tension and high tension cable guardrail when the in place cable is damaged and needs to be replaced. Cable Splices required shall be incidental to this contract item. All costs for retensioning of cables shall be incidental to the contract unit price per foot for the respective cable retensioning contract item.
- EE. **Straight Class A Thrie Beam Rail:** Straight Class A Thrie Beam Rail shall include all costs for removing damaged Thrie Beam rail and replacing with Class A Thrie Beam rail.
- FF. **Straight Class A W Beam Rail:** Straight Class A W Beam Rail shall include all costs for removing damaged W Beam rail and replacing with Class A W Beam rail.
- GG. **Straight Class B W Beam Rail:** Straight Class B W Beam Rail shall include all costs for removing damaged W Beam rail and replacing with Class B W Beam rail.
- HH. **W Beam to Thrie Beam Guardrail Transition:** W Beam to Thrie Beam Guardrail Transition shall include all costs for removing damaged rail and replacing with a W Beam to Thrie Beam Guardrail Transition.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

- II. **W Beam Guardrail Flared End Terminal:** W Beam Guardrail Flared End Terminal shall include all costs incurred for furnishing and installing an approved flared end terminal in accordance with details on Standard Plate 630.45. At some locations of W Beam Guardrail Flared End Terminal damage, the Area Engineer may decide to replace the existing W Beam Guardrail Flared End Terminal in lieu of replacing the various components of the W Beam Guardrail Flared End Terminal.

The Flared End Terminal shall be on the approved products list on Sheet 16 of 55.

The contract unit price per each for "W Beam Guardrail Flared End Terminal" shall include all costs incurred for furnishing and installing one (1) end section as shown on Standard Plate 630.45 including removal of the existing end terminal.

- JJ. **W Beam Guardrail Tangent End Terminal:** W Beam Guardrail Tangent End Terminal shall include all costs incurred for furnishing and installing an approved tangent end terminal in accordance with details on Standard Plate 630.46. At some locations of W Beam Guardrail Tangent End Terminal damage, the Area Engineer may decide to replace the existing W Beam Guardrail Tangent End Terminal in lieu of replacing the various components of the W Beam Guardrail Tangent End Terminal.

The Tangent End Terminal shall be on the approved products list on Sheet 16 of 55.

The contract unit price per each for "W Beam Guardrail Tangent End Terminal" shall include all costs incurred for furnishing and installing one (1) end section as shown on Standard Plate 630.46 including removal of the existing end terminal.

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

- LL. **Beam Guardrail Post & Block:** Beam Guardrail Post & Block shall include all costs for removing the broken post and installing a post and block. Any holes required to be drilled in the posts, such as the 3 1/2" diameter holes for the MELT end posts as per Standard Plate SPECIAL - A (3 of 3), shall also be included. Beam Guardrail Post & Block shall include replacement of post and blocks located within the limits of the Tangent and Flared End Terminals.

- MM. **Beam Guardrail Post & Block, Winter:** Beam Guardrail Post & Block, Winter shall include all costs incurred for replacement of a steel beam guardrail post when there is in excess of one foot of frozen ground at the work site. When this condition exists, the contract unit price per each for "Beam Guardrail Post & Block, Winter" will be the pay unit rather than the contract unit price per each for "Beam Guardrail Post & Block". The Contractor shall field drill 3 1/2" diameter holes in posts as per Standard Plate SPECIAL - A (3 of 3) when placing MELT ends. Beam Guardrail Post & Block, Winter shall include replacement of post and blocks located within the limits of the Tangent and Flared End Terminals.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

- NN. End Terminal Wood Breakaway Post:** End Terminal Wood Breakaway Post shall include all costs incurred for removal of a broken wood end post and installing a replacement wood end post in a steel tube sleeve. This contract item shall include replacement of wood posts on various end terminals including Breakaway Cable Terminals (BCT), Modified Eccentric Loader Terminals (MELT), Trailing End Terminals, Tangent End Terminals and Flared End Terminals. The Contractor shall be responsible for making sure the wood post matches the appropriate Standard Plate or end terminal manufacturer's requirements.
- OO. End Terminal Hinged Breakaway Post:** End Terminal Hinged Breakaway Post shall include all costs incurred for removal of a hinged breakaway end post and installing a replacement hinged post on a post bottom base. This contract item shall include replacement of hinged breakaway posts on various end terminals including Tangent End Terminals and Flared End Terminals. The Contractor shall be responsible for making sure the hinged breakaway post matches the end terminal manufacturer's requirements.
- PP. Breakaway Cable Terminal End Rail:** Breakaway Cable Terminal (B.C.T) End Rail shall include all costs incurred for removing the 12.5 ft. or 25 ft section of damaged B.C.T. W beam adjacent to the Radius Terminal Element and replacing with new guardrail. The Contractor shall field drill holes in the guardrail for installation.
- QQ. W-Beam Guardrail End Section Buffer:** W-Beam Guardrail End Section Buffer shall include all costs incurred for installing a buffer assembly. Removal of the existing end section buffer shall be incidental to this contract item.
- RR. Tangent End Terminal Extruder Head:** Tangent End Terminal Extruder Head shall include all costs incurred for removing the damaged extruder head and installing a new extruder head on the Tangent End Terminal.
- SS. Tangent End Terminal Rail:** Tangent End Terminal Rail shall include all costs incurred for removing 12.5 ft. or 25 ft. section(s) of damaged beam guardrail and replacing new beam guardrail on the Tangent End Terminal.
- TT. Rubrail:** Rubrail shall include all costs to install rubrail. The Contractor shall provide the necessary wood blocks and bolts to attach the rubrail to the wood posts.
- UU. Drive Down Beam Guardrail Post:** Drive Down Beam Guardrail Post shall include all costs for adjusting the height of a steel beam guardrail post. All costs to disassemble the steel beam guardrail shall be incidental to this contract item.
- VV. Reset Beam Guardrail Post & Block:** Reset Beam Guardrail Post & Block shall include all costs for removing and resetting post to properly align the steel beam section. Payment for "Reset Beam Guardrail Post & Block" shall be the same in frozen or unfrozen ground.
- WW. 2.0 LB/FT Flanged Channel Post:** 2.0 LB/FT Flanged Channel Post shall be used to replace damaged delineator posts in a guardrail installation area. 2.0 LB/FT Flanged Channel Post will also be the pay item for the 3.5 ft long base post if it is required. The retainer-spacer strap and other miscellaneous hardware required shall be incidental to the contract unit price per foot for 2.0 LB/FT Flanged Channel Post. Delineators themselves will be paid for separately as 4" x 4" White Delineator Reflector.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

XX. **4" x 4" White Delineator Reflector:** 4" x 4" White Delineator Reflector shall be used to replace damaged and/or missing delineator heads on existing delineator posts in a guardrail installation area. Any post straightening or realignment of posts shall be incidental to the contract unit price per each for 4" x 4" White Delineator Reflector. 4" x 4" White Delineator Reflector will also be the pay item for delineator heads when installing a new 2.0 LB/FT Flanged Channel Post. A typical installation will require 2 delineator heads. Delineator heads shall be fastened to the post with pop rivets.

YY. **Guardrail Delineator:** Guardrail Delineators shall be as shown on Standard Plate 632.40. The appropriate delineator shall be used on the 3 Cable Guardrail and the Beam Guardrail as indicated on Standard Plate 632.40. Delineator color shall be as detailed on Standard Plate 632.40.

ZZ. **Type 2 Object Marker Back to Back:** Type 2 Object Markers shall be as shown on Standard Plate 632.40. Type 2 Object Markers Back to Back shall be installed to mark the Cable Guardrail Anchor for two-way traffic as indicated on Standard Plate 632.40. Contract item includes the post and the reflectors.

AAA. **Type 2 Object Marker:** Type 2 Object Markers shall be as shown on Standard Plate 632.40. Type 2 Object Markers shall be installed to mark the Cable Guardrail Anchor for one-way traffic as indicated on Standard Plate 632.40. Contract item includes the post and the reflector.

BBB. **Flagging:** Payment for flagging will include all costs for provided certified flagger, stop/slow paddle, flag, and any nighttime illumination required. The accepted number of flagging hours will be paid for at the rate specified in the Special Provision for Price Schedule for Miscellaneous Items.

9. Traffic Control shall be installed by the Contractor in accordance with the details on Sheets 17 thru 19 of the Contract. All signs, channelizing devices, and arrow boards shall conform to the requirements of the Manual of Uniform Traffic Control Devices. All costs for furnishing, installing, and maintaining the traffic control shall be incidental to the contract unit prices for the various contract items. Separate measurement and payment will not be made.

When work is being performed on two way traffic roadways, flagging shall be furnished by the Contractor in accordance with the standard plate included in this contract.

Portable sign supports shall be constructed to yield upon impact to minimize hazards to motorists. The bottom of signs on portable or temporary supports shall not be less than seven feet above the pavement in urban areas and one foot above the pavement in rural areas. Portable sign supports may be used as long as the duration is less than 3 days. If the duration is more than 3 days the signs shall be on fixed location, ground mounted, breakaway supports.

It shall be the responsibility of the Contractor to ensure that all devices meet the applicable NCHRP 350 or MASH crash-worthy requirements.

Equipment and vehicles entering or exiting the roadway, traveling on the shoulders or driving lanes at low speeds or working within the right-of-way shall display a flashing amber light visible for a minimum distance of 1/4 mile in all directions.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

10. When the Contractor is called in to work at more than one site within an Area, Mobilization will only be paid once. In the event that Mobilization is required in two or more Areas at one time, the Contractor will be paid Mobilization into each one of the specific Areas. The cover sheets show where bridges are located within the Areas. There may be additional locations that have guardrail such as box culverts, large pipe, and steep inslopes which are not indicated on the cover sheets. Long runs of Cable Guardrail exist on several water hazard sites. These include:

SD 25 from MRM 175.5 to MRM 177.8 in Day County – High Tension 4 Cable Guardrail
(Lengths of cable runs at this location are 784', 1291', 2255', 2464', 4335', & 7118')

US 212 from MRM 350.6 to MRM 351.7 in Clark County – Low Tension 3 Cable Guardrail

11. The Standard Plates included in this contract are provided for information purposes on how the various guardrail items are to be constructed and the materials required to complete the work. Plan notes contained on Sheets 7 thru 14 of this contract shall take precedence over notes contained on the Standard Plates.
12. The Contractor shall be responsible for removing and disposing of all guardrail components that are not being reused on the project. Guardrail components shall not be discarded in the highway right-of-way or waterways.
13. Reflectorized Sheeting Requirements for Temporary Traffic Control Devices.

Delete the first paragraph of Section 984.1 and replace with the following:



Temporary traffic control devices, including signs, drums, cones, tubular markers, barricades, vertical panels, and direction indicator barricades shall be reflectorized with sheeting applied to a satisfactory backing. For all temporary traffic control warning signs, the reflective sheeting shall meet or exceed the standards of Type VII, Type VIII, Type IX, or Type XI as defined by AASHTO M 268 (ASTM D4956). For all other temporary traffic control signs, the reflective sheeting shall meet or exceed the standards of Type IV, Type V, Type VII, Type VIII, Type IX, or Type XI as defined by AASHTO M 268 (ASTM D4956). For barricades, vertical panels, and direction indicator barricades; the reflective sheeting shall meet or exceed the standards of Type III as defined by AASHTO M 268 (ASTM D4956). Round surfaced temporary traffic control devices including, but not limited to; drums, cones, and tubular markers shall be reflectorized with reflectorized sheeting meeting or exceeding the standards of Type IV as defined by AASHTO M 268 (ASTM D4956). All orange colored material shall be fluorescent.

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

Approved W Beam Guardrail End Terminals		
Product Type:	Product Name:	Manufacturer:
W Beam Guardrail Flared End Terminal	Fleat 350	Road System, Inc. Big Spring TX (432) 263-2435 http://www.roadsystems.com
W Beam Guardrail Flared End Terminal	SRT-350 (6-Post System)	Trinity Industries Co. (SYRO Inc.) Dallas TX (800) 644-7976 http://www.trinitycpg.com
W Beam Guardrail Tangent End Terminal	SKT 350	Road System, Inc. Big Spring TX (432) 263-2435 http://www.roadsystems.com

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 Flagger
 Channelizing Device

END
ROAD WORK
G20-2

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

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Published Date: 2nd Qtr. 2016

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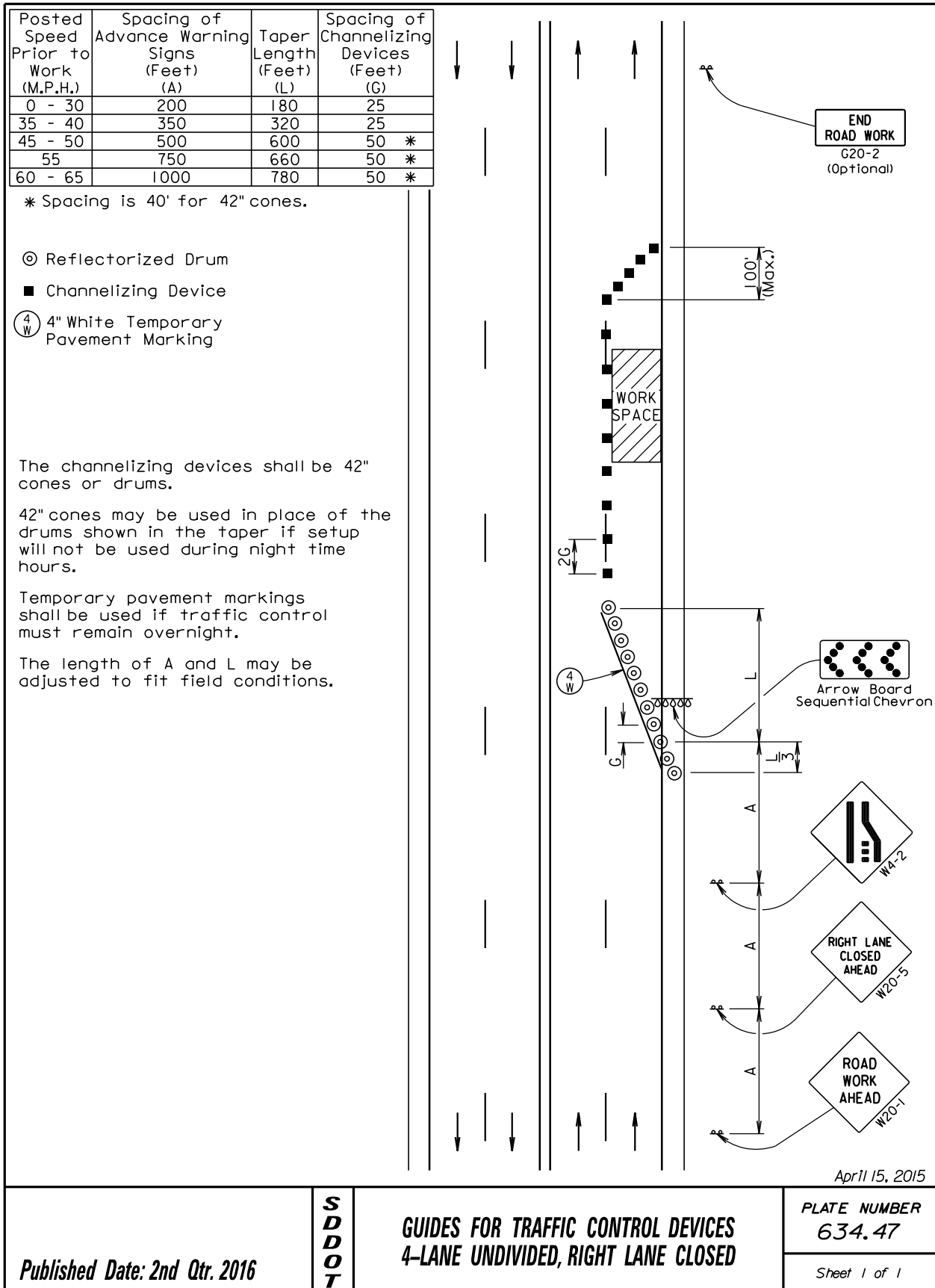
GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED

PLATE NUMBER
634.23

Sheet 1 of 1

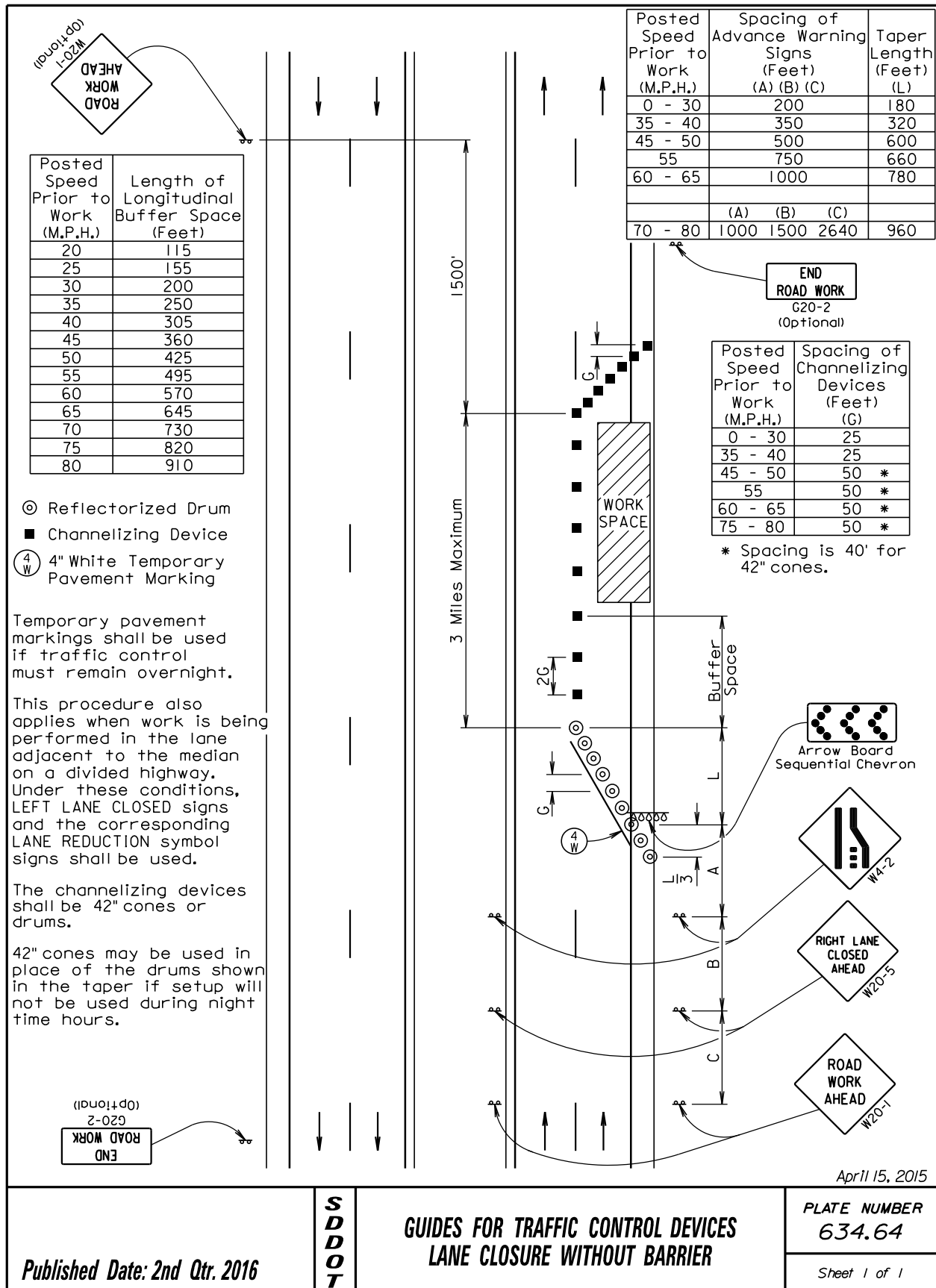
GUARDRAIL REPAIR

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GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



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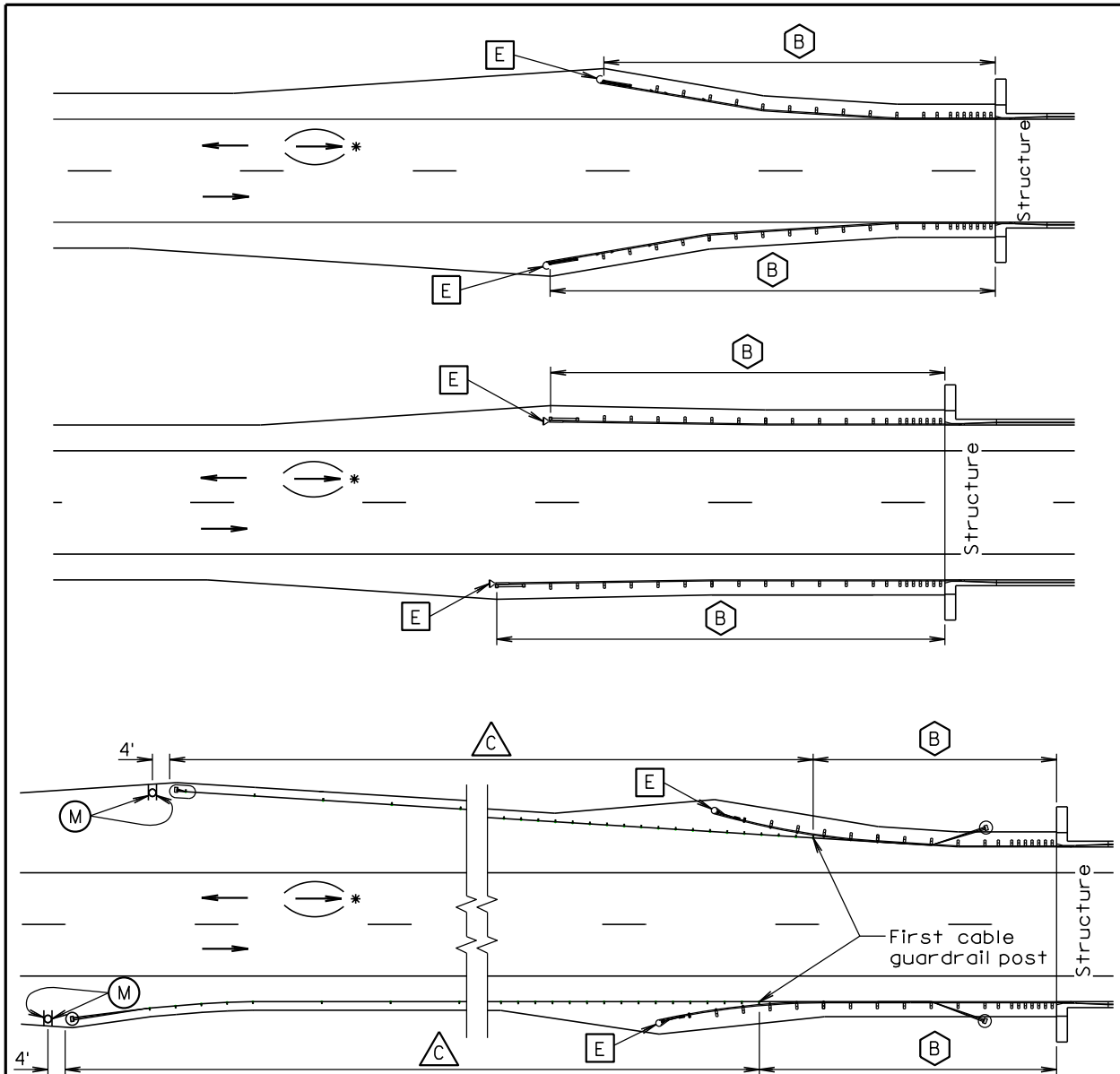
**GUIDES FOR TRAFFIC CONTROL DEVICES
LANE CLOSURE WITHOUT BARRIER**

PLATE NUMBER
634.64

Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



TYPICAL GUARDRAIL LAYOUTS

- Steel Beam Guardrail Delineation
- Guardrail Terminal End Object Marker
- 3 Cable Guardrail Delineation
- 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: 2nd Qtr. 2016

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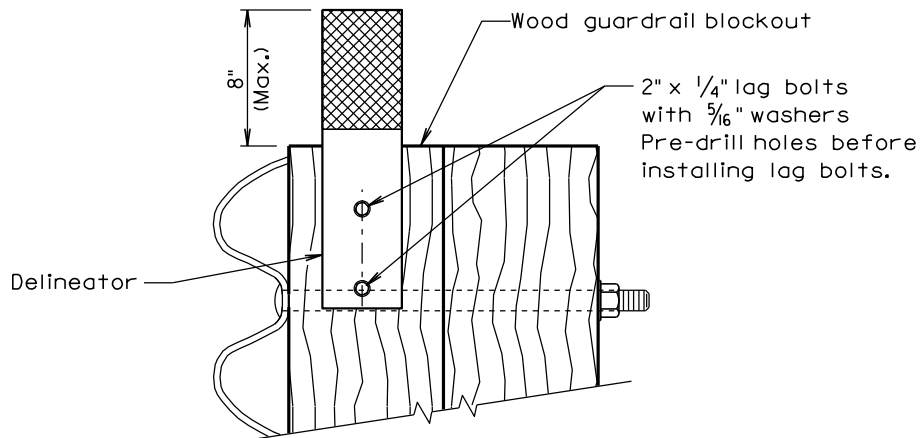
DELINEATION OF GUARDRAIL AT BRIDGES

PLATE NUMBER
632.40

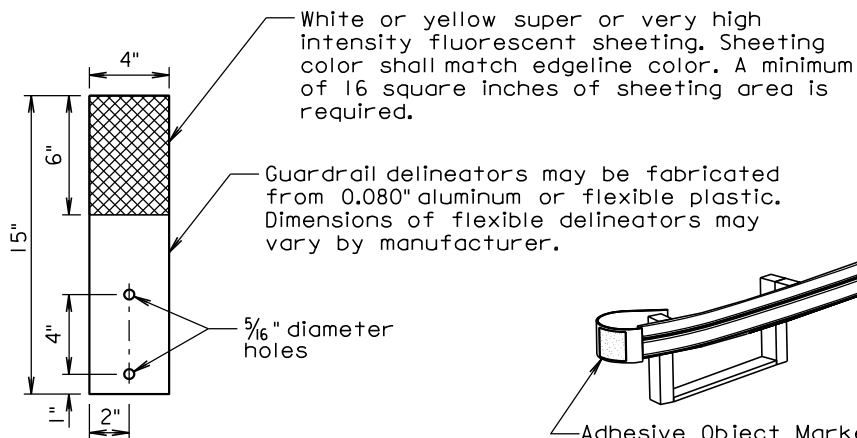
Sheet 1 of 4

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

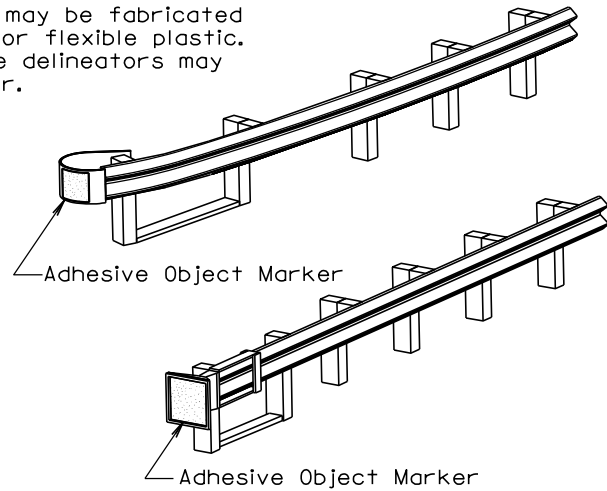


B STEEL BEAM GUARDRAIL DELINEATION

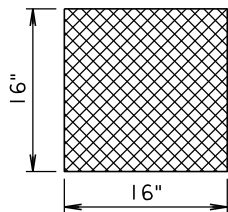


DELINEATOR

(For Steel Beam Guardrail)



E GUARDRAIL TERMINAL END OBJECT MARKER



ADHESIVE OBJECT MARKER

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

June 26, 2011

Published Date: 2nd Qtr. 2016

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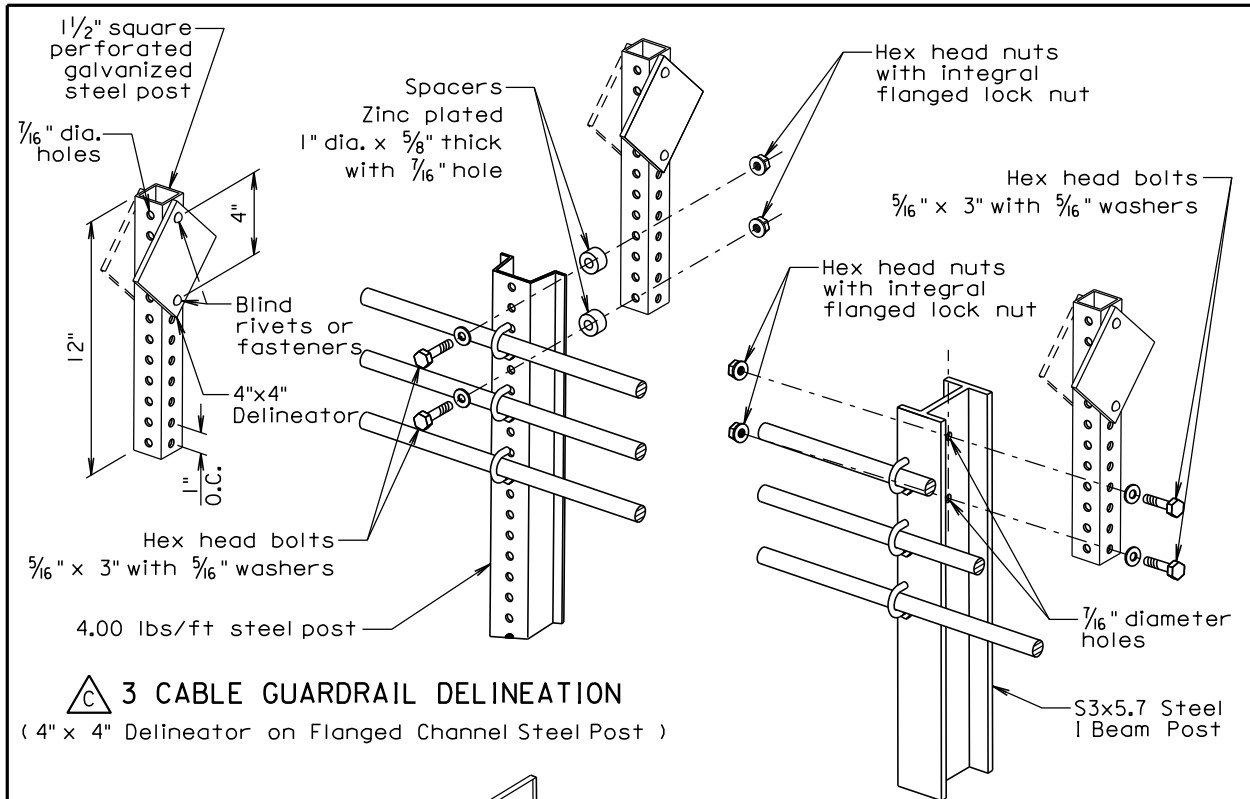
DELINEATION OF GUARDRAIL AT BRIDGES

PLATE NUMBER
632.40

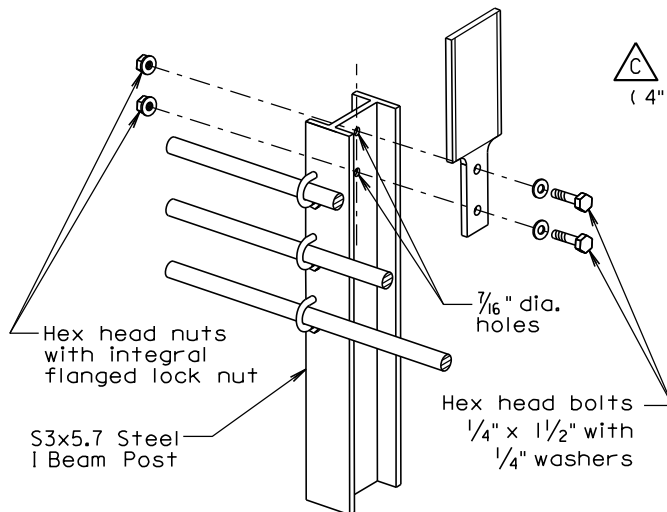
Sheet 2 of 4

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT,
HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

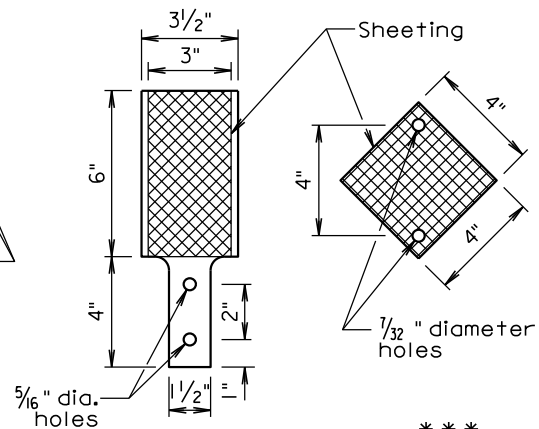


△ 3 CABLE GUARDRAIL DELINEATION
(4" x 4" Delineator on Flanged Channel Steel Post)



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

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



DELINEATORS***
(For 3 Cable Guardrail)

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

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

June 26, 2011

Published Date: 2nd Qtr. 2016

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DELINEATION OF GUARDRAIL AT BRIDGES

PLATE NUMBER
632.40

Sheet 3 of 4

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



(For Marking 3 Cable Guardrail Anchor)

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

Sheet 23 of 55

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

December 16, 2015

Published Date: 2nd Qtr. 2016

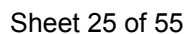
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**3 CABLE GUARDRAIL
(LOW TENSION)**

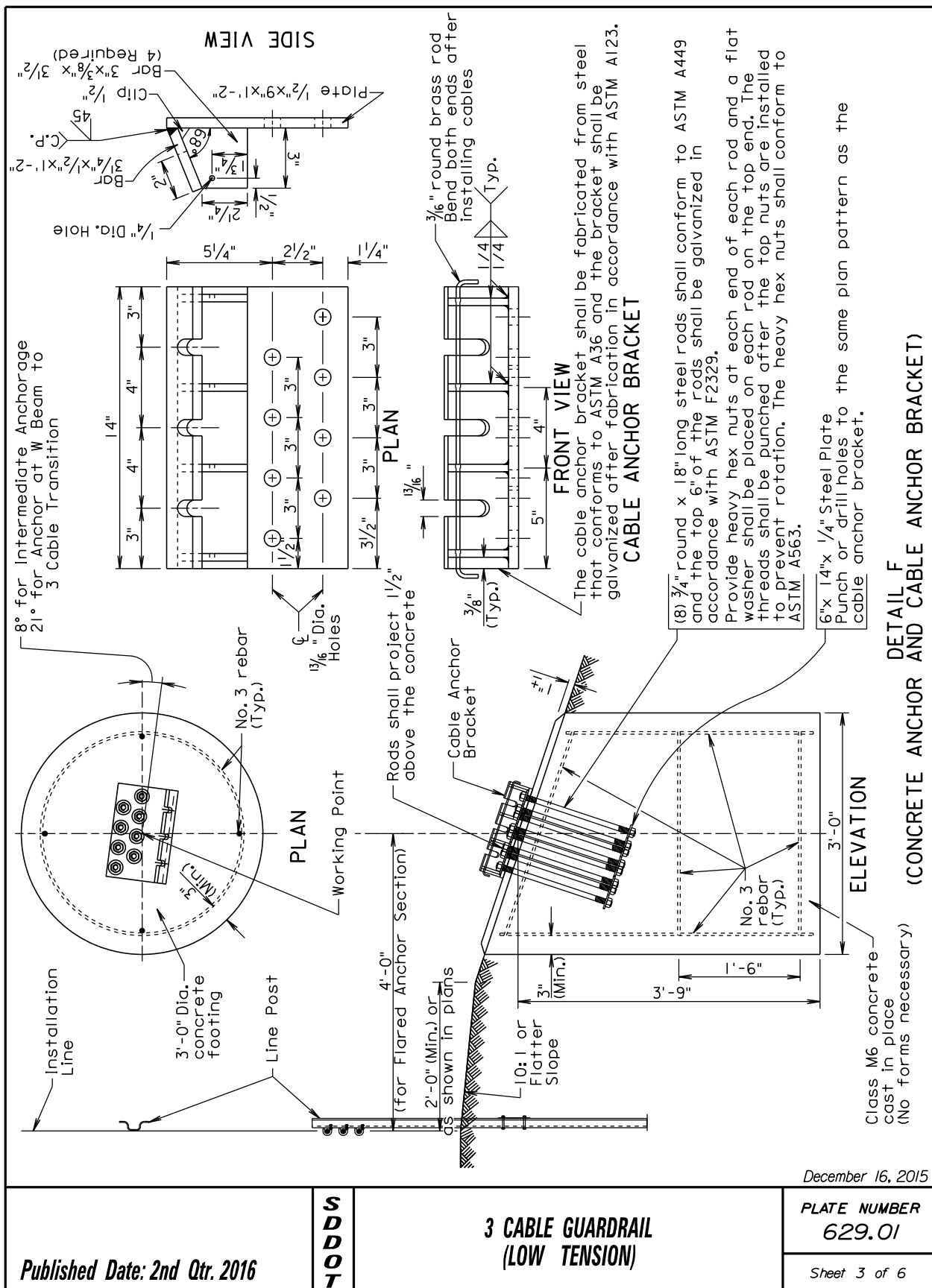
**PLATE NUMBER
629.01**

Sheet 1 of 6

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

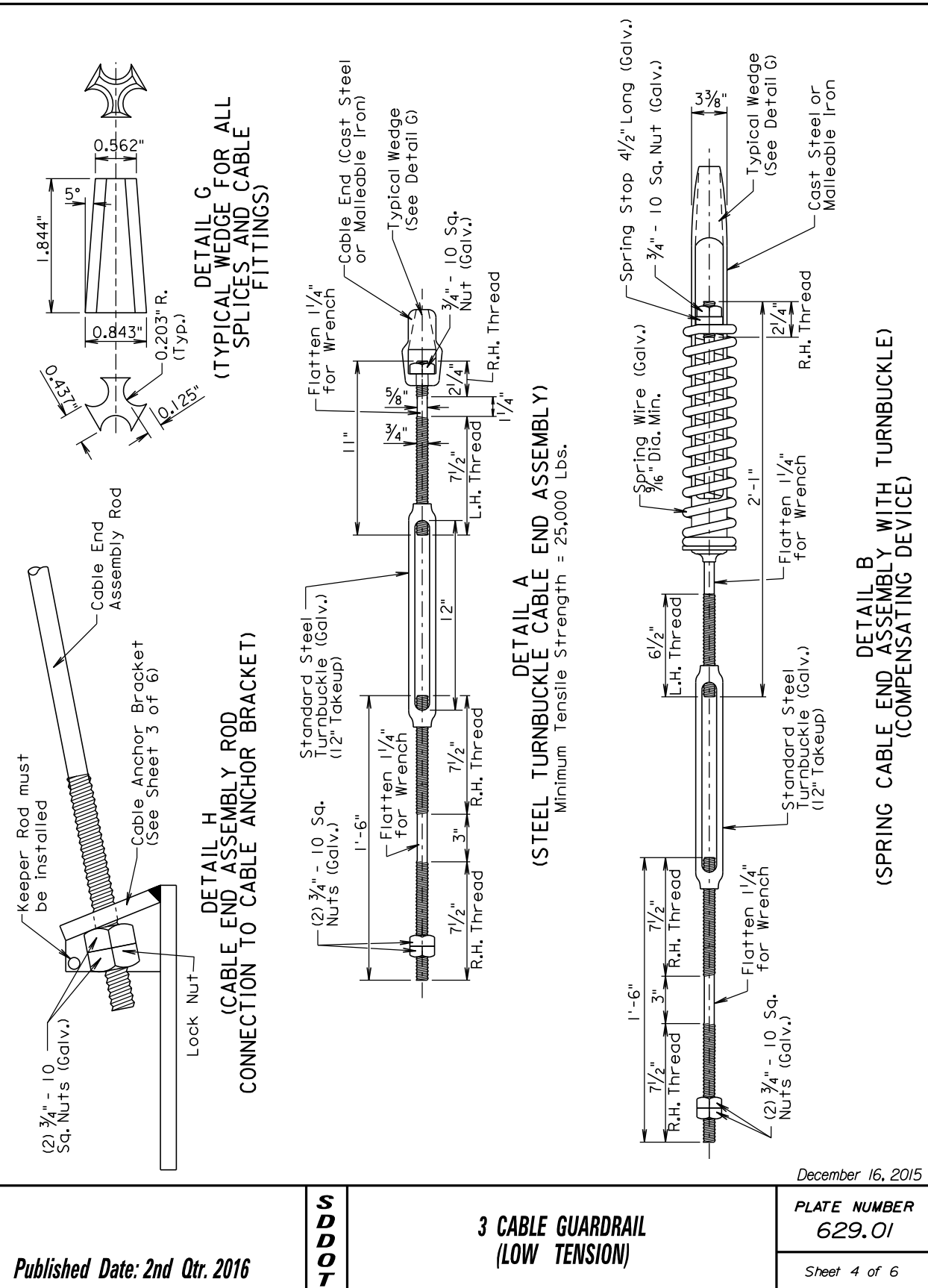


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GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



December 16, 2015

Published Date: 2nd Qtr. 2016

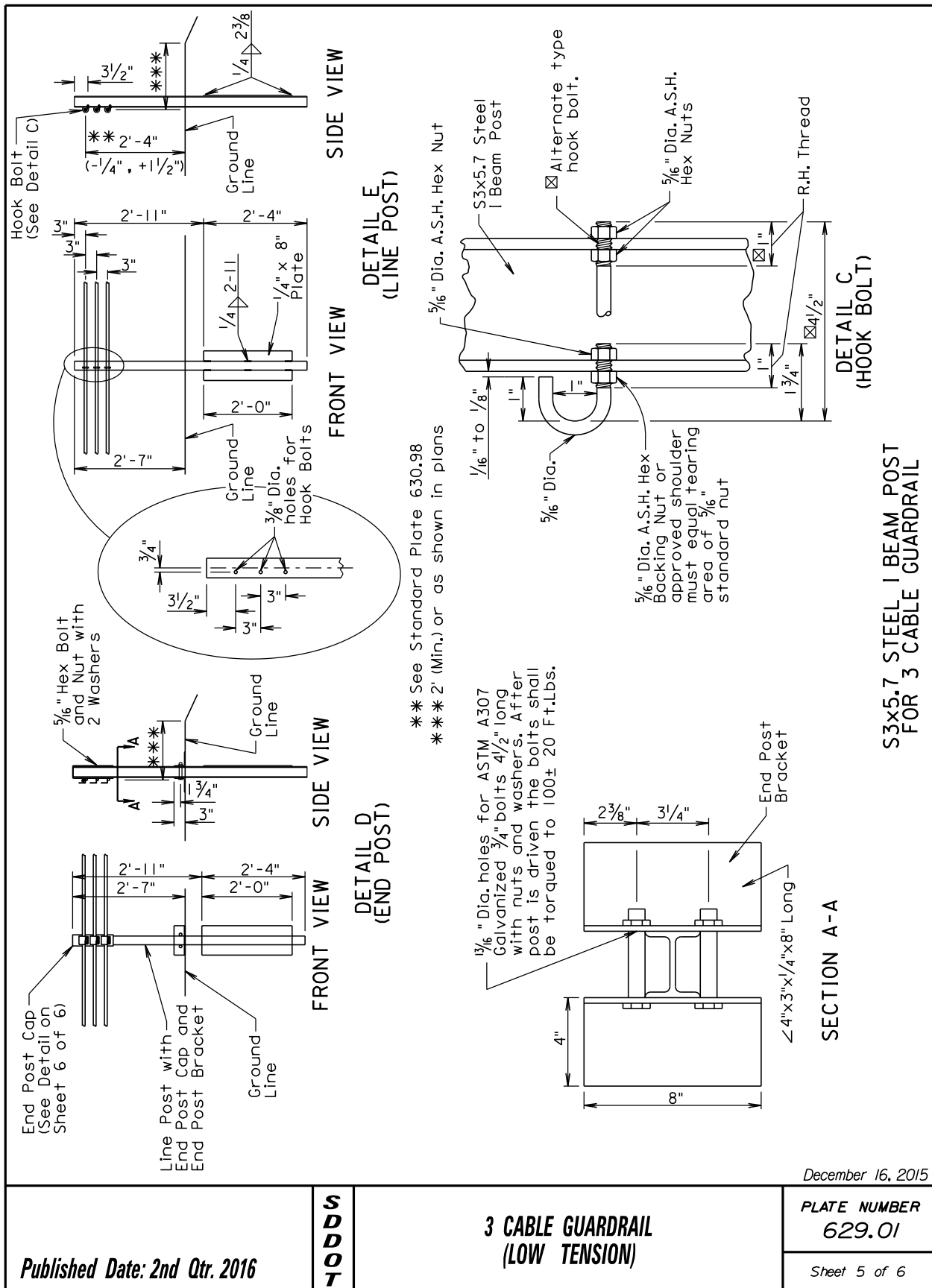
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3 CABLE GUARDRAIL
(LOW TENSION)

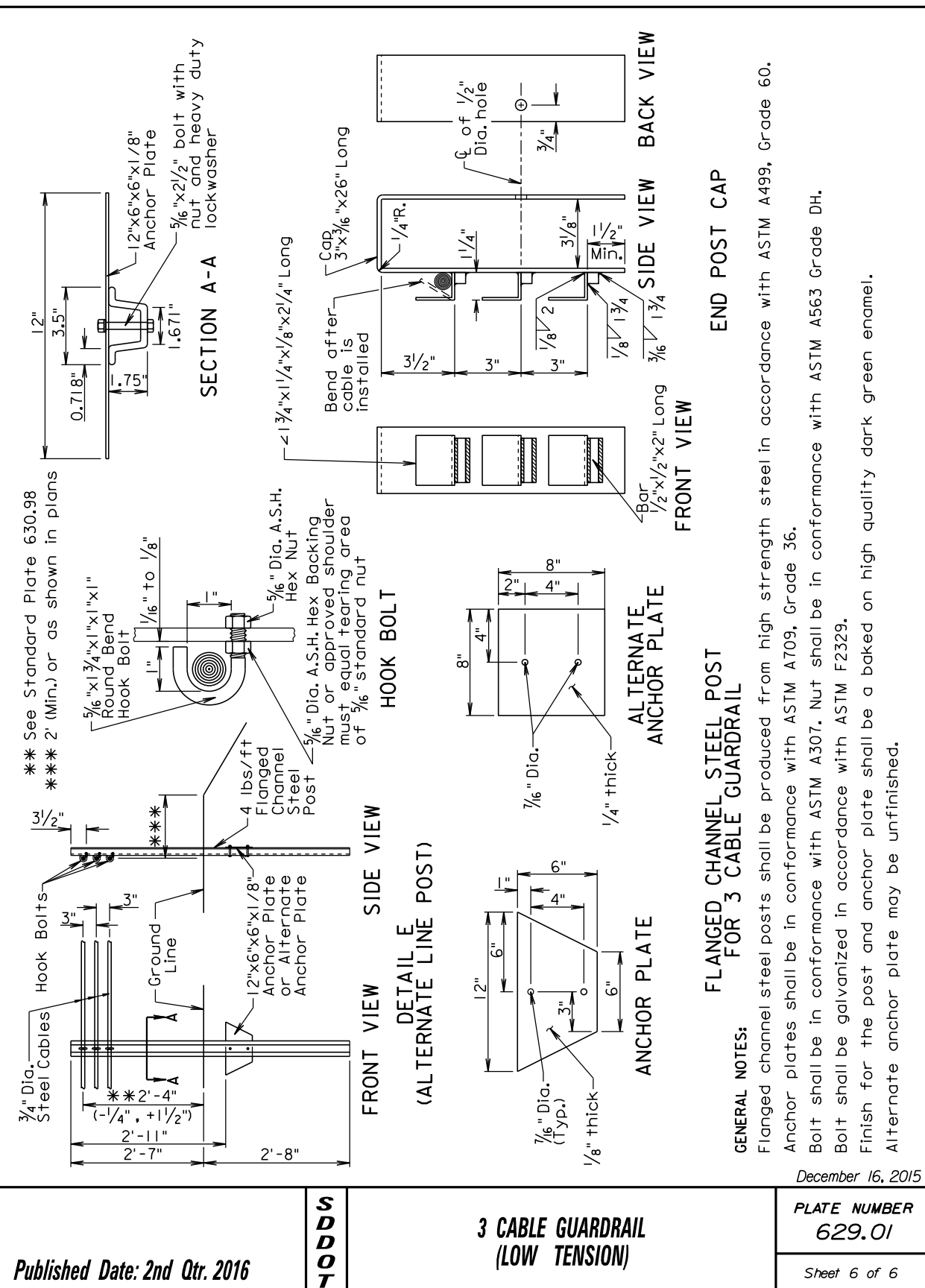
PLATE NUMBER
629.01

Sheet 4 of 6

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

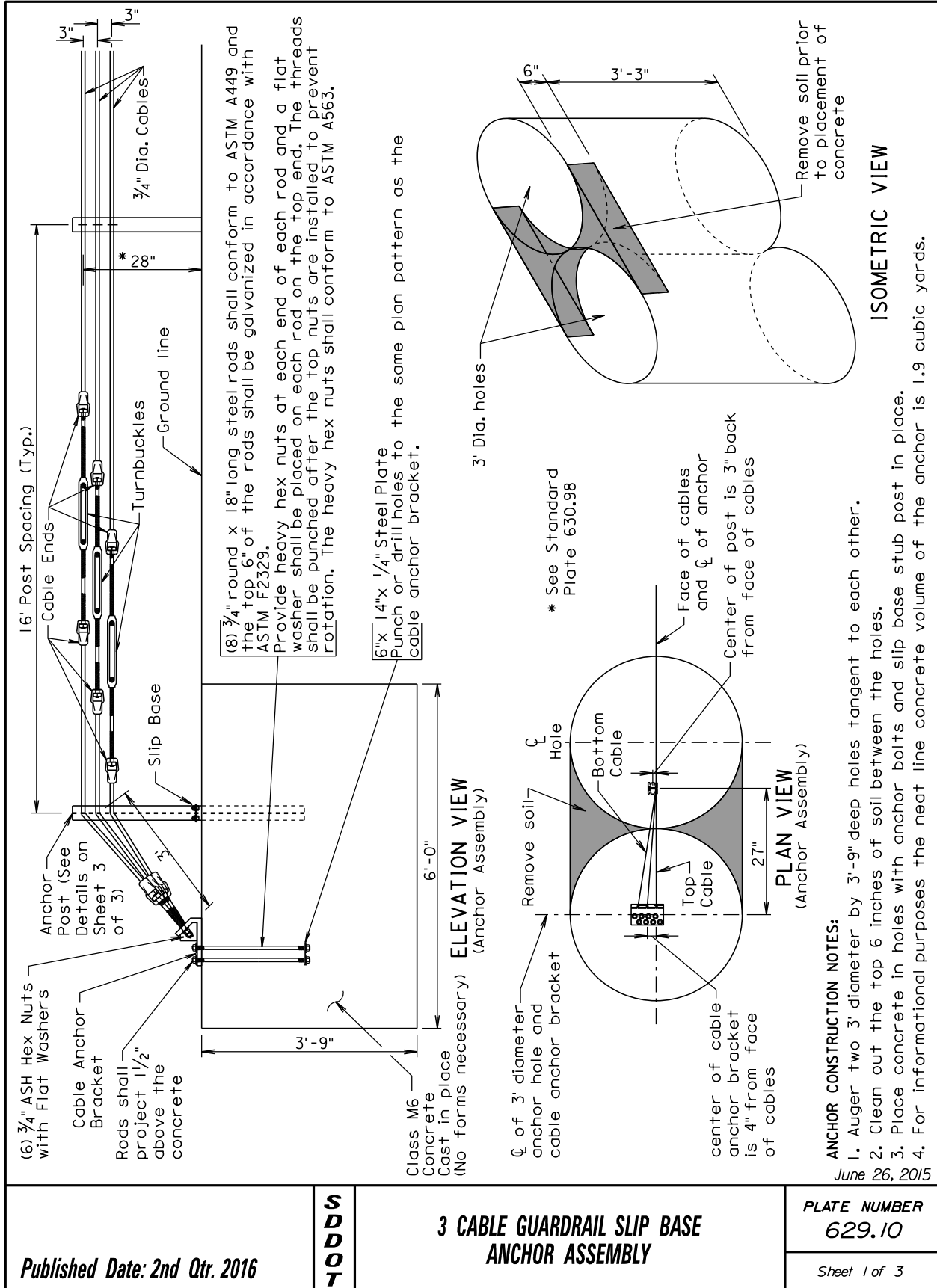


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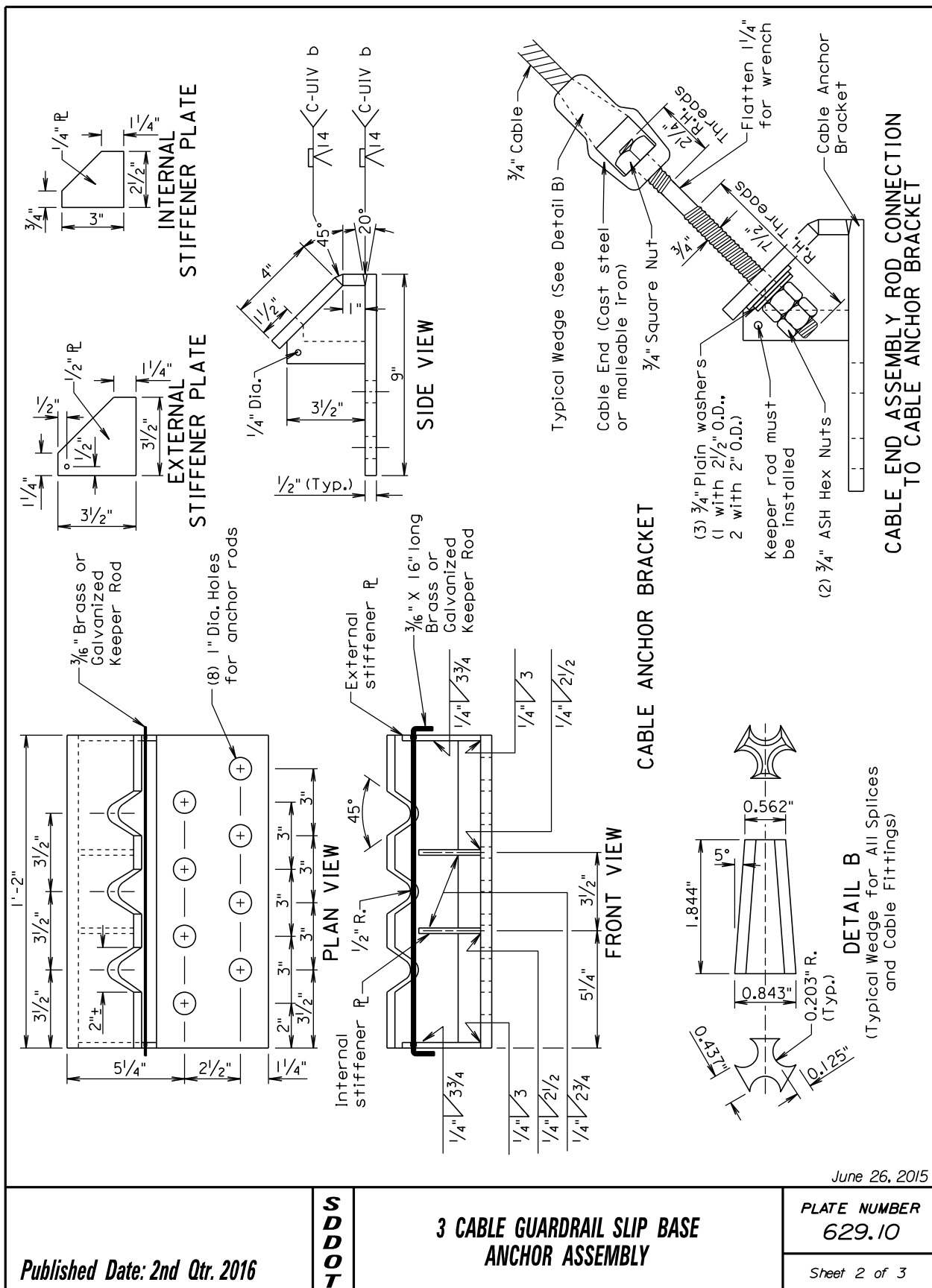


GUARDRAIL REPAIR

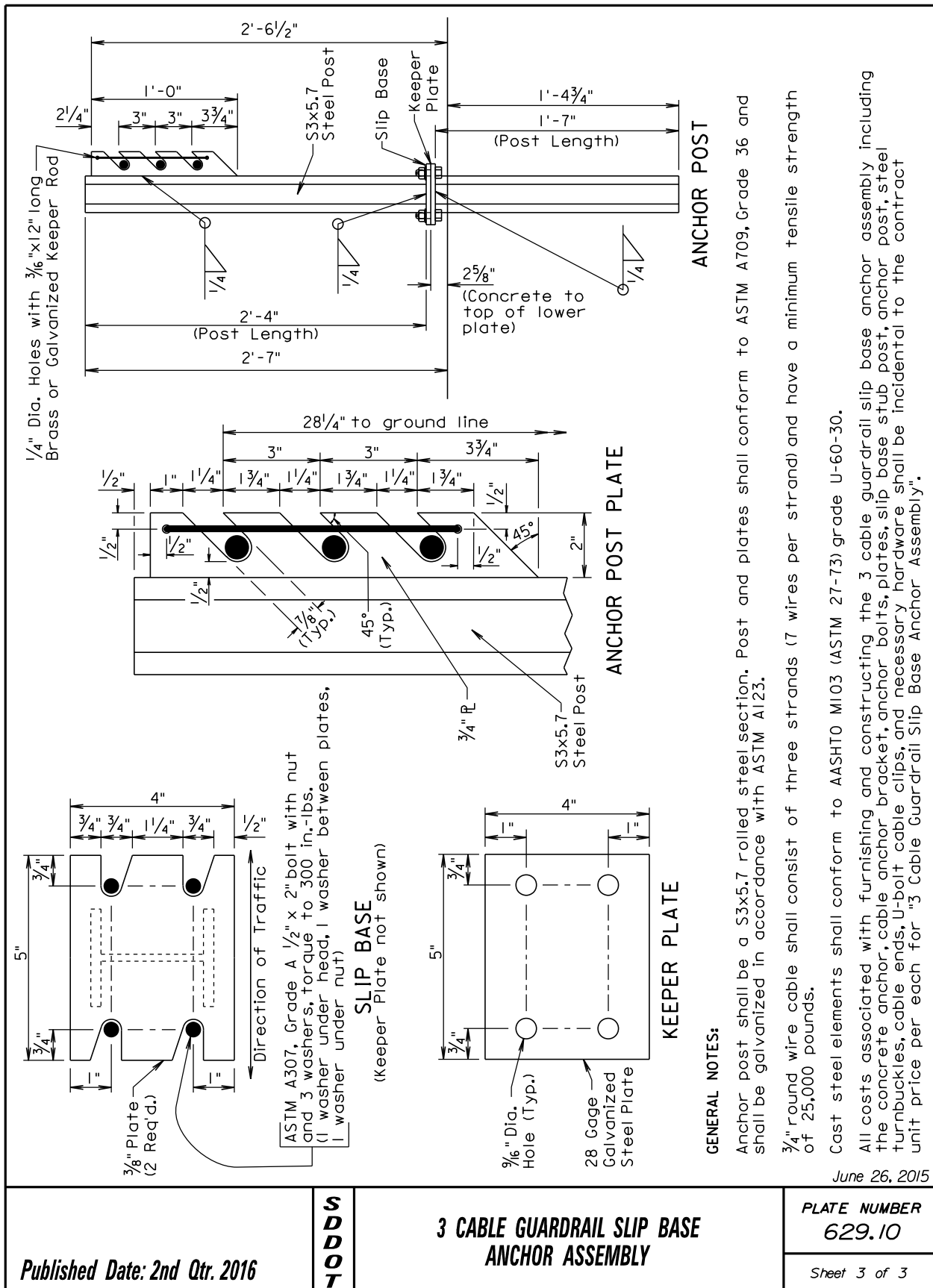
BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



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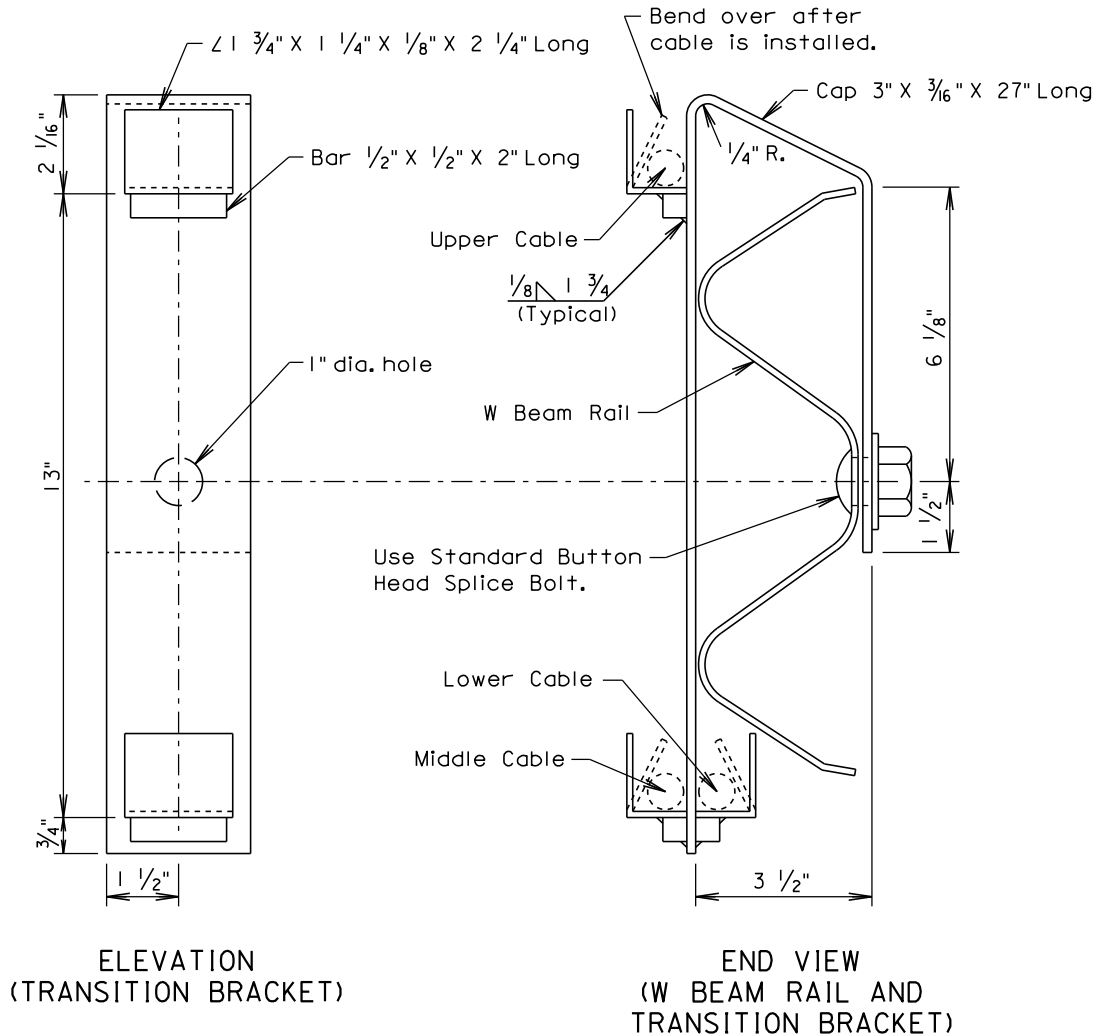


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GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



GENERAL NOTES:

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

March 31, 2000

Published Date: 2nd Qtr. 2016

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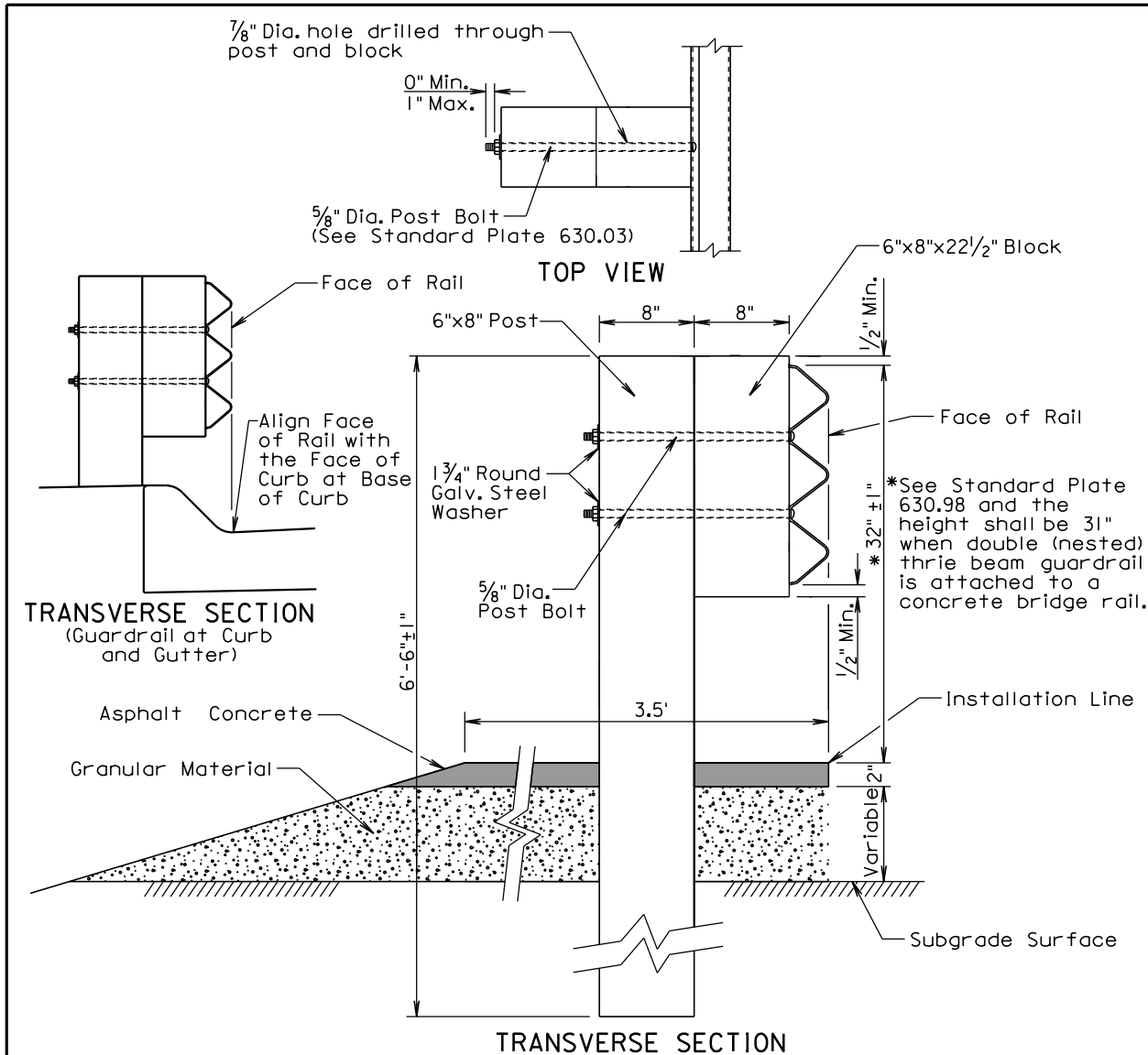
W BEAM TO 3 CABLE TRANSITION BRACKET

**PLATE NUMBER
629.15**

Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



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: 2nd Qtr. 2016

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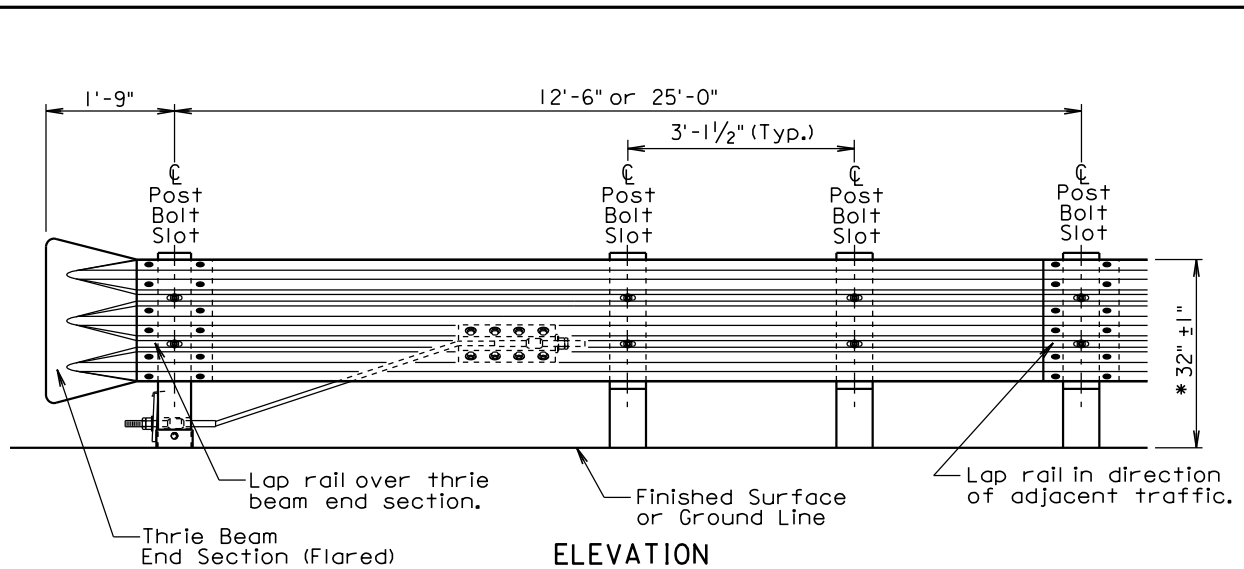
THRIE BEAM GUARDRAIL POST INSTALLATION

PLATE NUMBER
630.01

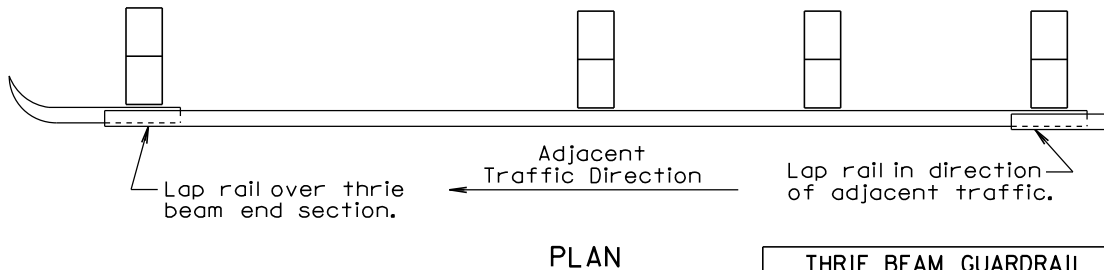
Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



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



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

For Informational Purposes Only

GENERAL NOTES:

All thrie beam rail shall be Type I.

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: 2nd Qtr. 2016

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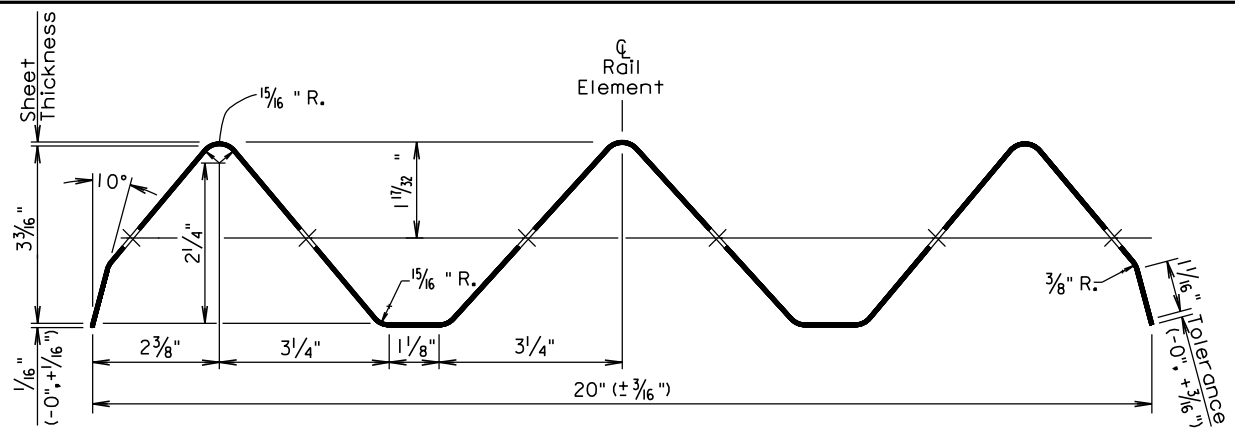
THRIE BEAM GUARDRAIL INSTALLATION

**PLATE NUMBER
630.02**

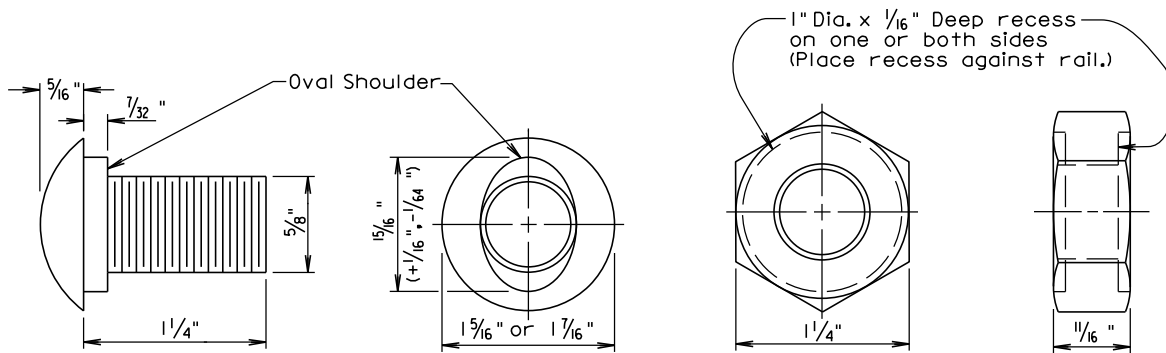
Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

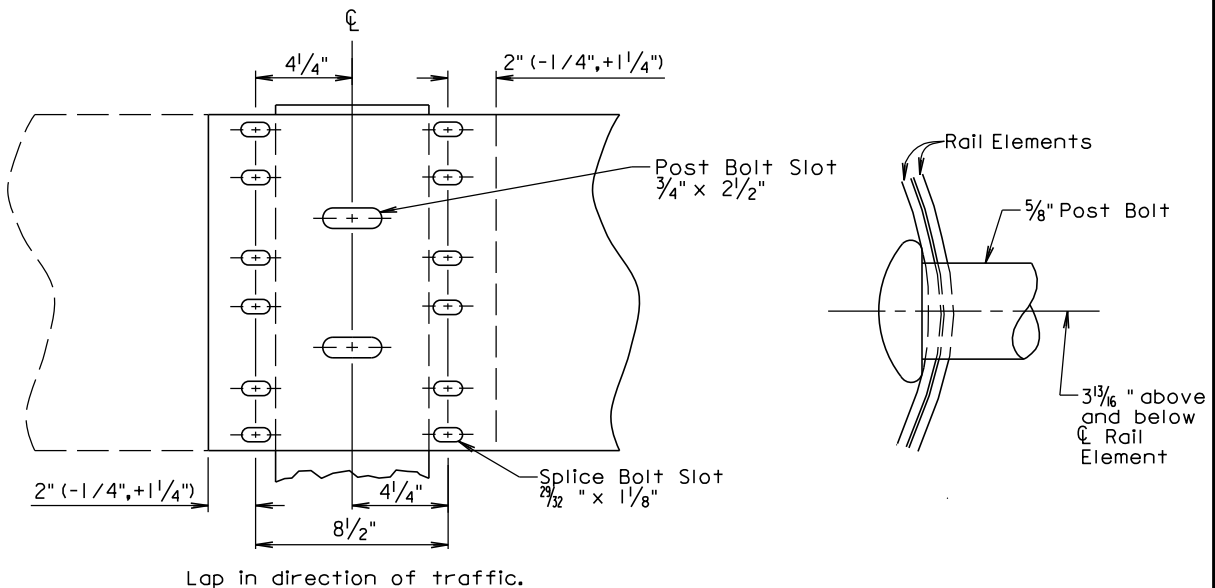


SECTION THROUGH THRIE BEAM RAIL ELEMENT



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

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



Lap in direction of traffic.

RAIL SPLICE

March 31, 2000

Published Date: 2nd Qtr. 2016

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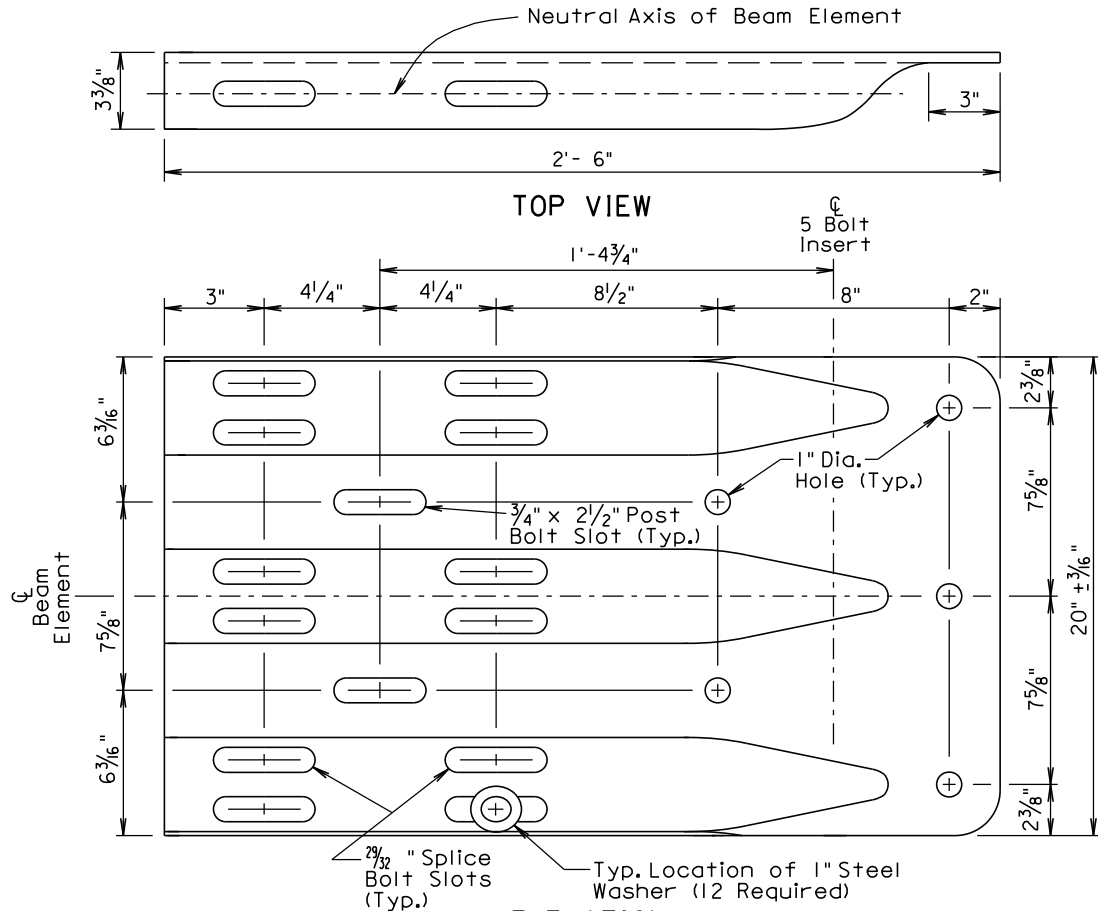
THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE

**PLATE NUMBER
630.03**

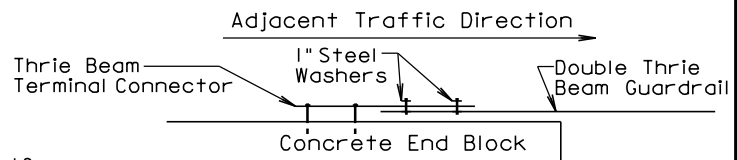
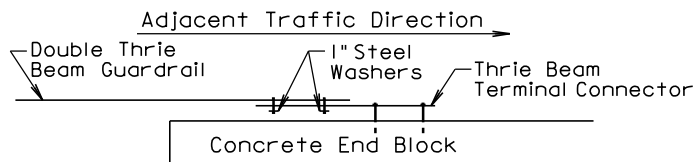
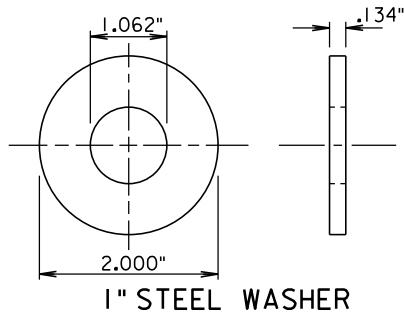
Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



ELEVATION THRIE BEAM TERMINAL CONNECTOR



GENERAL NOTES:

Thrie Beam Terminal Connectors shall be 10 gauge.

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

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

September 14, 2001

Published Date: 2nd Qtr. 2016

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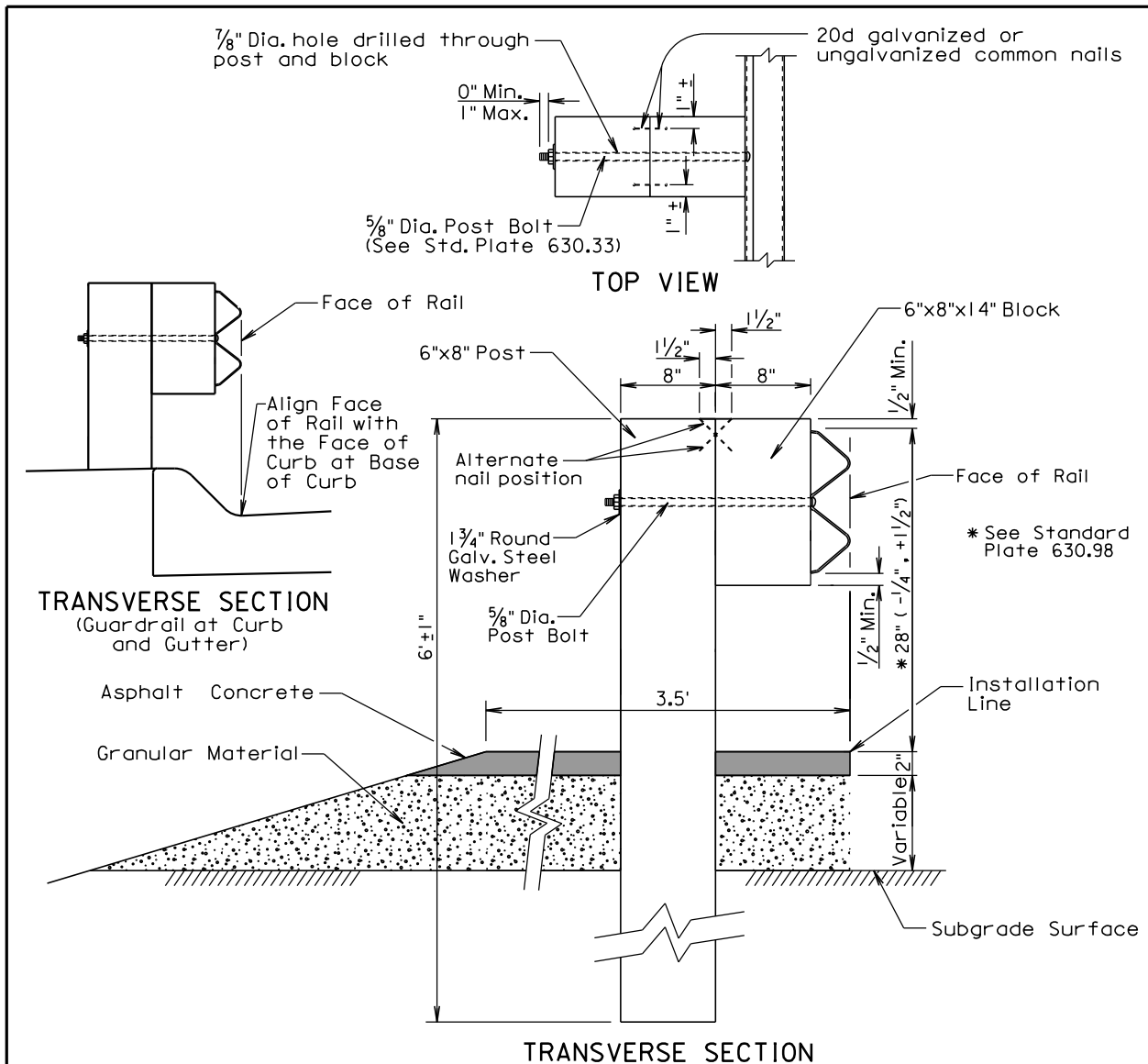
**THRIE BEAM TERMINAL CONNECTOR
AND 1" STEEL WASHER**

**PLATE NUMBER
630.05**

Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



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: 2nd Qtr. 2016

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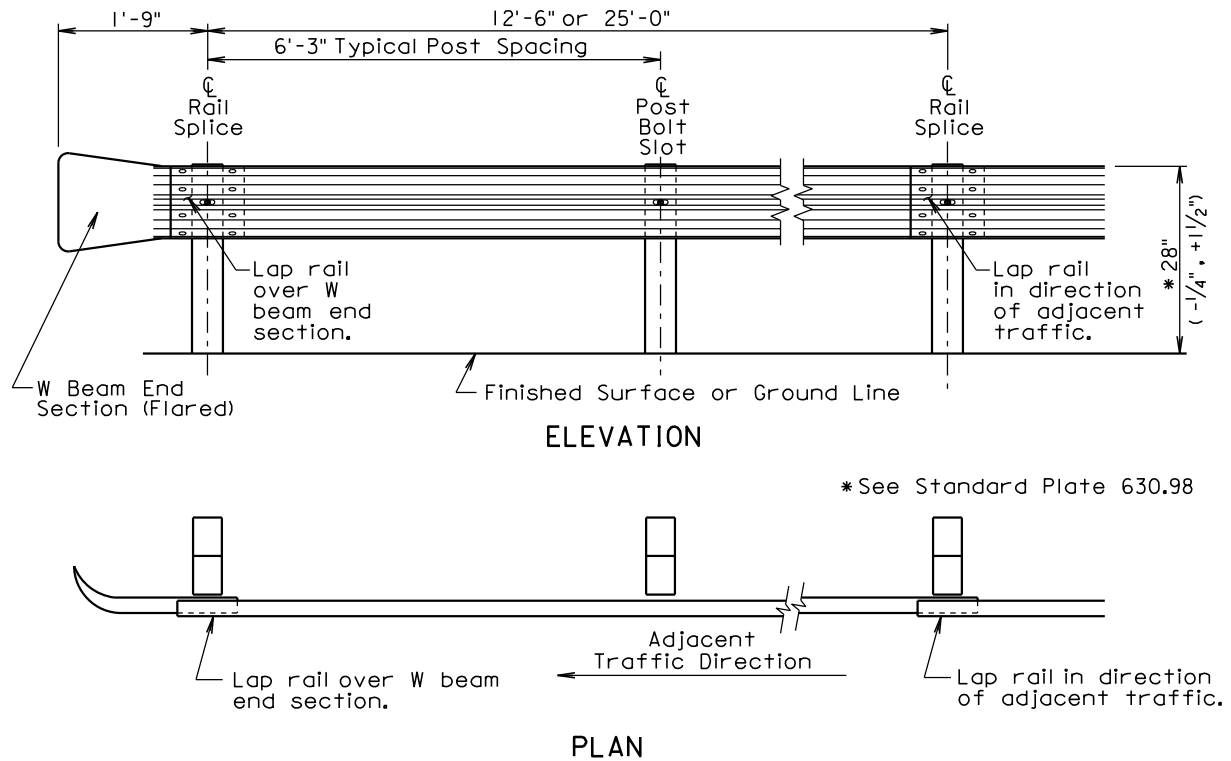
W BEAM GUARDRAIL POST INSTALLATION

PLATE NUMBER
630.31

Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



*See Standard Plate 630.98

POST SPACING	MAXIMUM DEFLECTION
6'-3"	5'-0"
3'-1½"	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: 2nd Qtr. 2016

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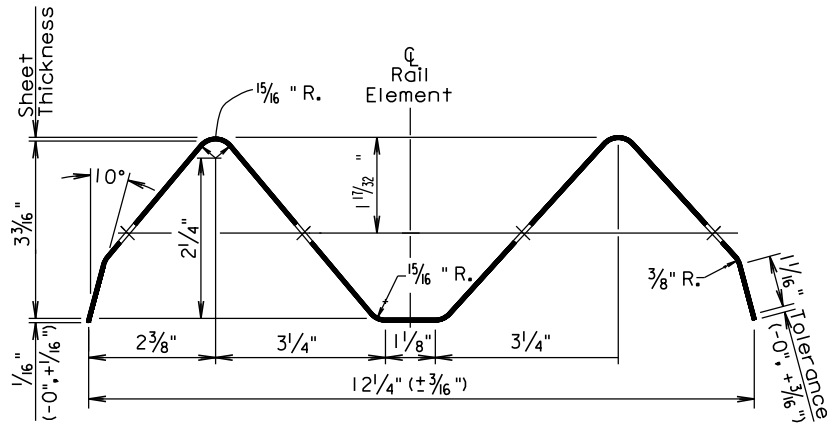
W BEAM GUARDRAIL INSTALLATION

PLATE NUMBER
630.32

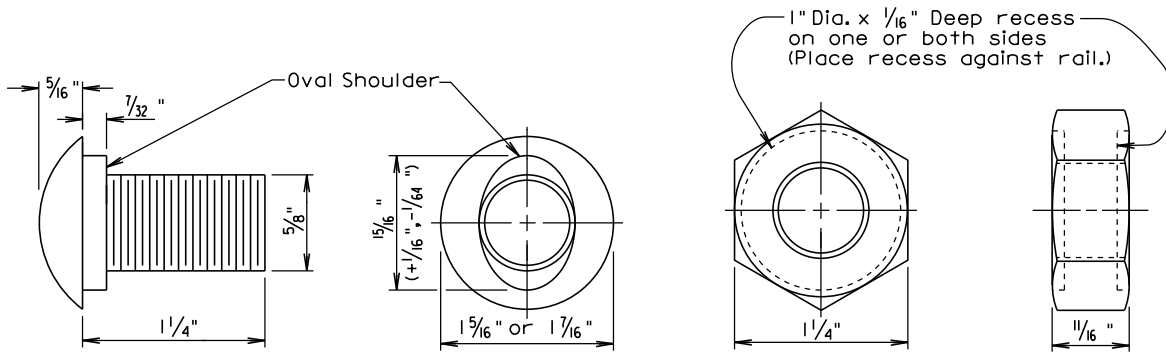
Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES

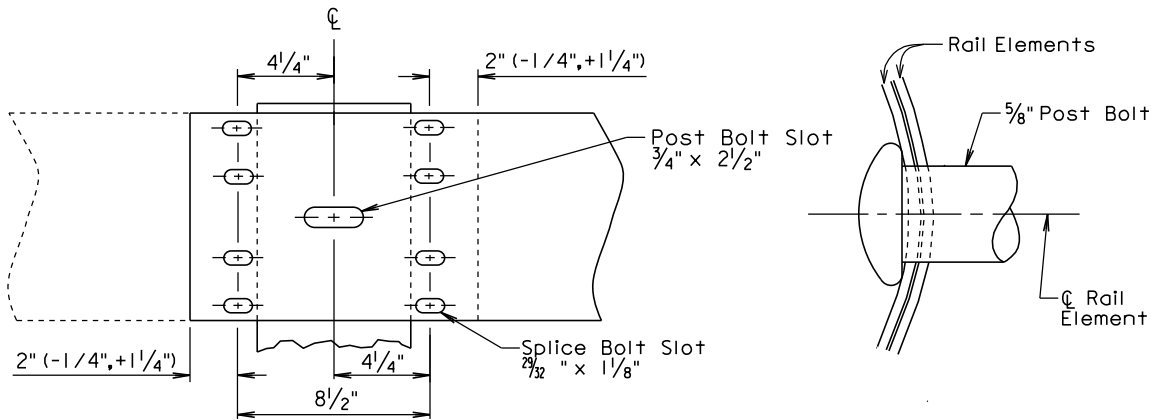


SECTION THROUGH W BEAM RAIL ELEMENT



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

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



Lap in direction of traffic.

RAIL SPLICE

December 23, 2004

Published Date: 2nd Qtr. 2016

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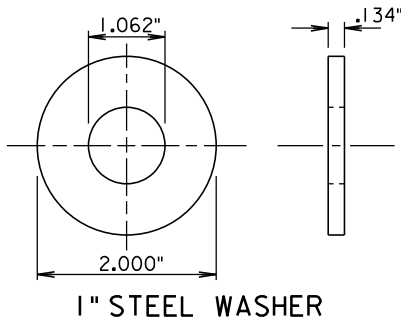
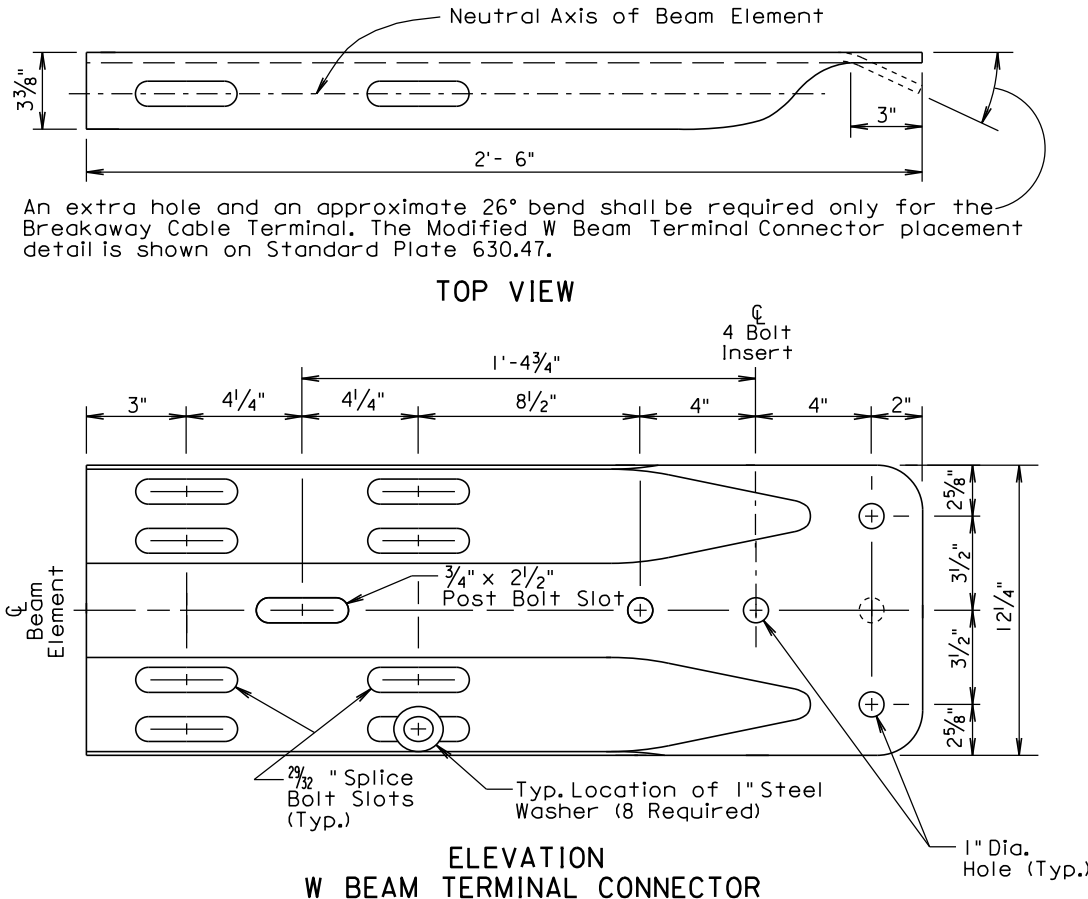
W BEAM RAIL, RAIL SPLICE, AND HARDWARE

**PLATE NUMBER
630.33**

Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



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: 2nd Qtr. 2016

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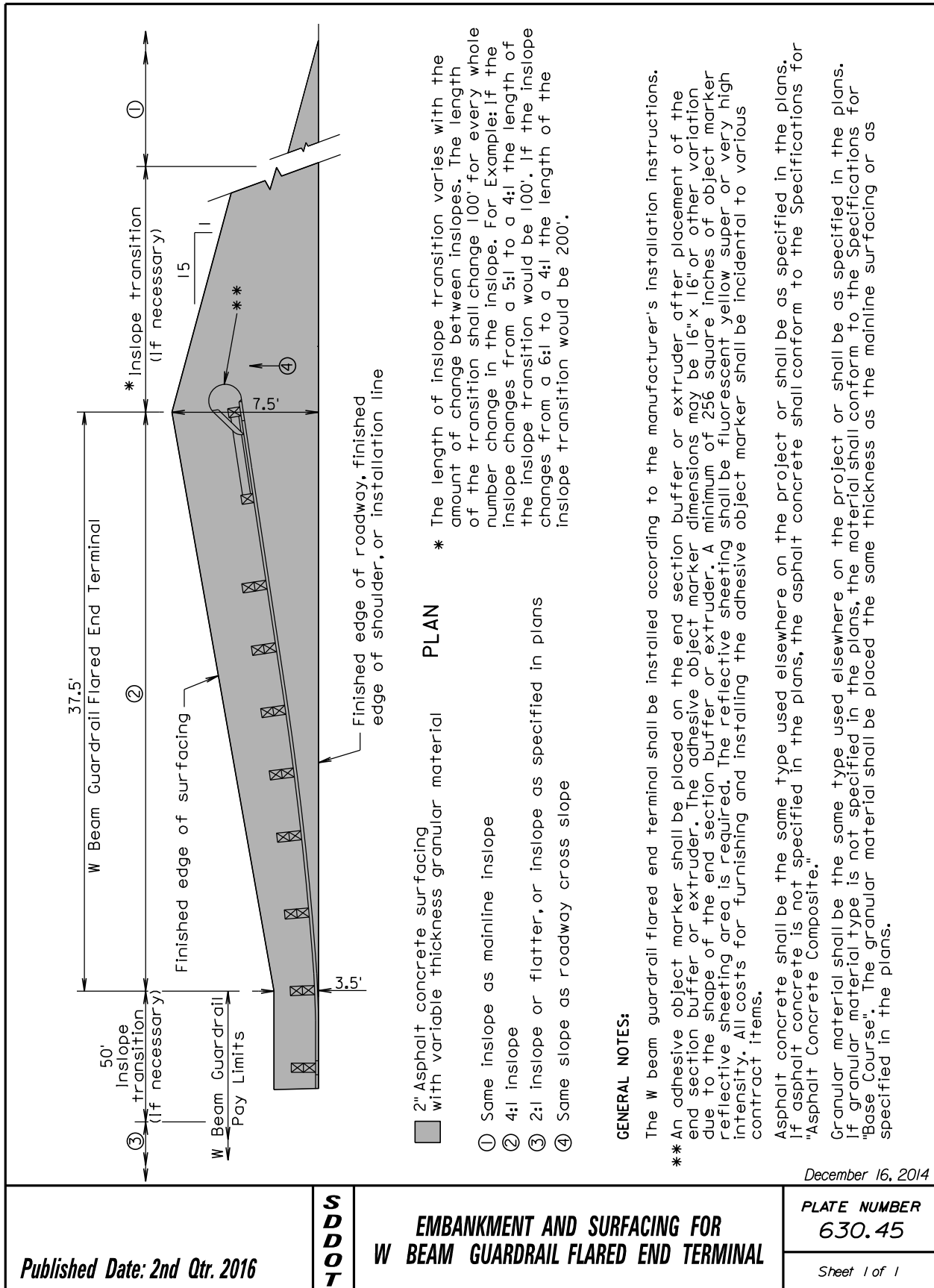
**W BEAM TERMINAL CONNECTOR
AND 1" STEEL WASHER**

**PLATE NUMBER
630.35**

Sheet 1 of 1

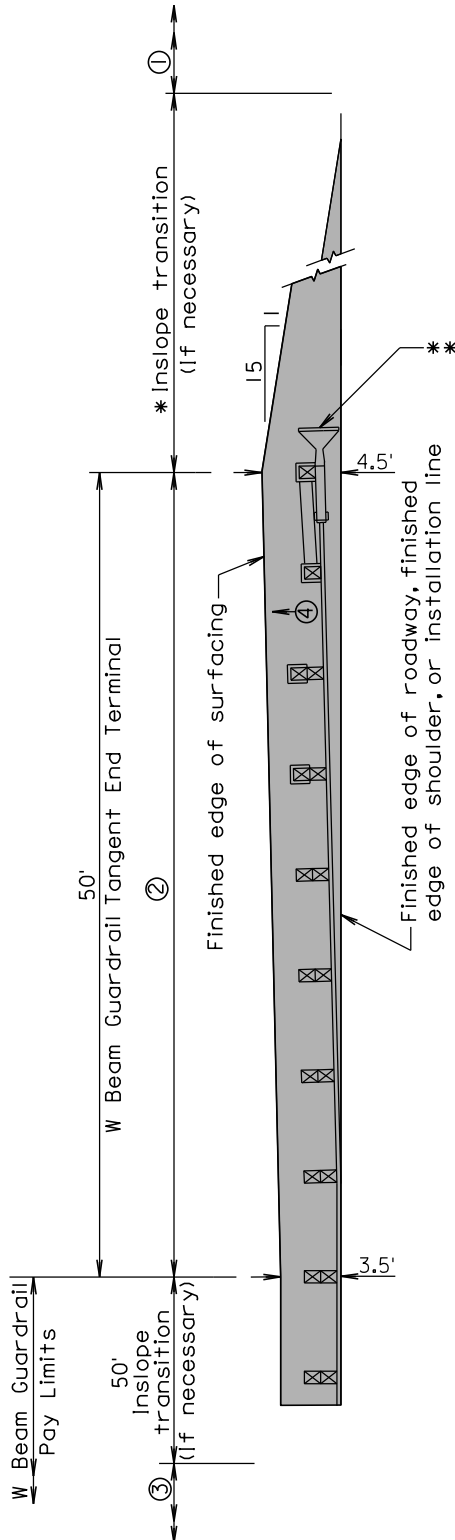
GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



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 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: 2nd Qtr. 2016

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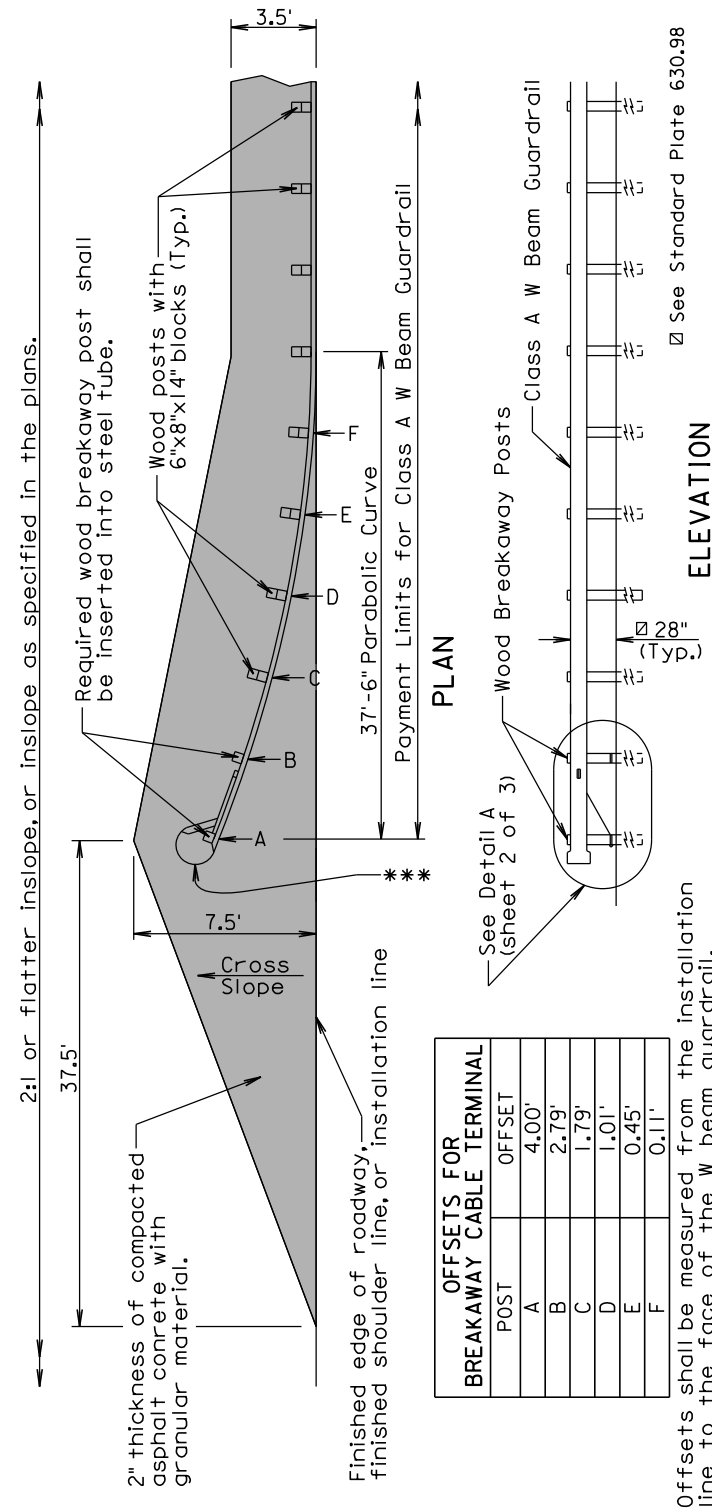
**EMBANKMENT AND SURFACING FOR
W BEAM GUARDRAIL TANGENT END TERMINAL**

**PLATE NUMBER
630.46**

Sheet 1 of 1

GUARDRAIL REPAIR

BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



GENERAL NOTES:

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

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

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

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

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

December 16, 2014

Published Date: 2nd Qtr. 2016

SDOT

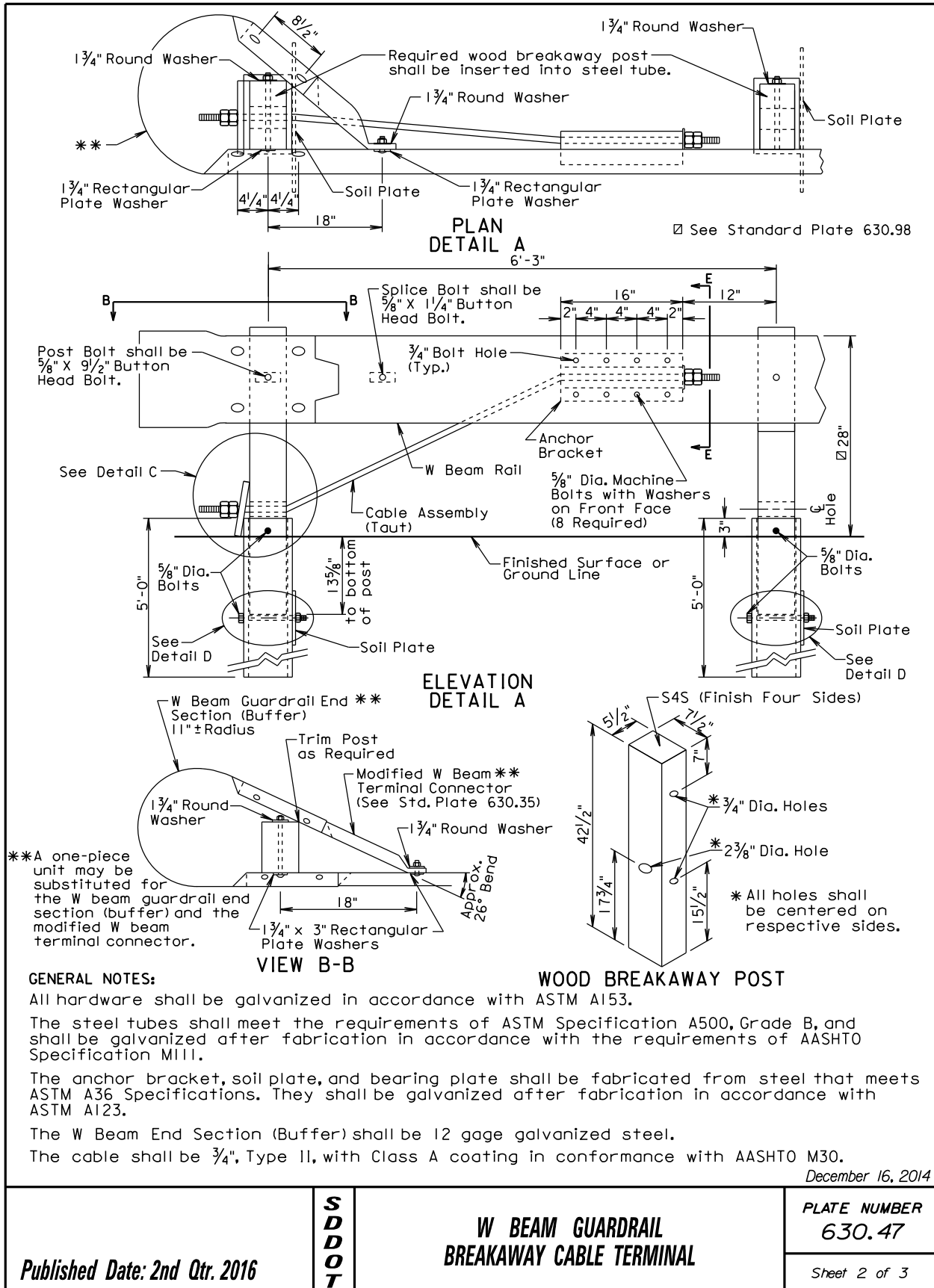
W BEAM GUARDRAIL
BREAKAWAY CABLE TERMINAL

PLATE NUMBER
630.47

Sheet 1 of 3

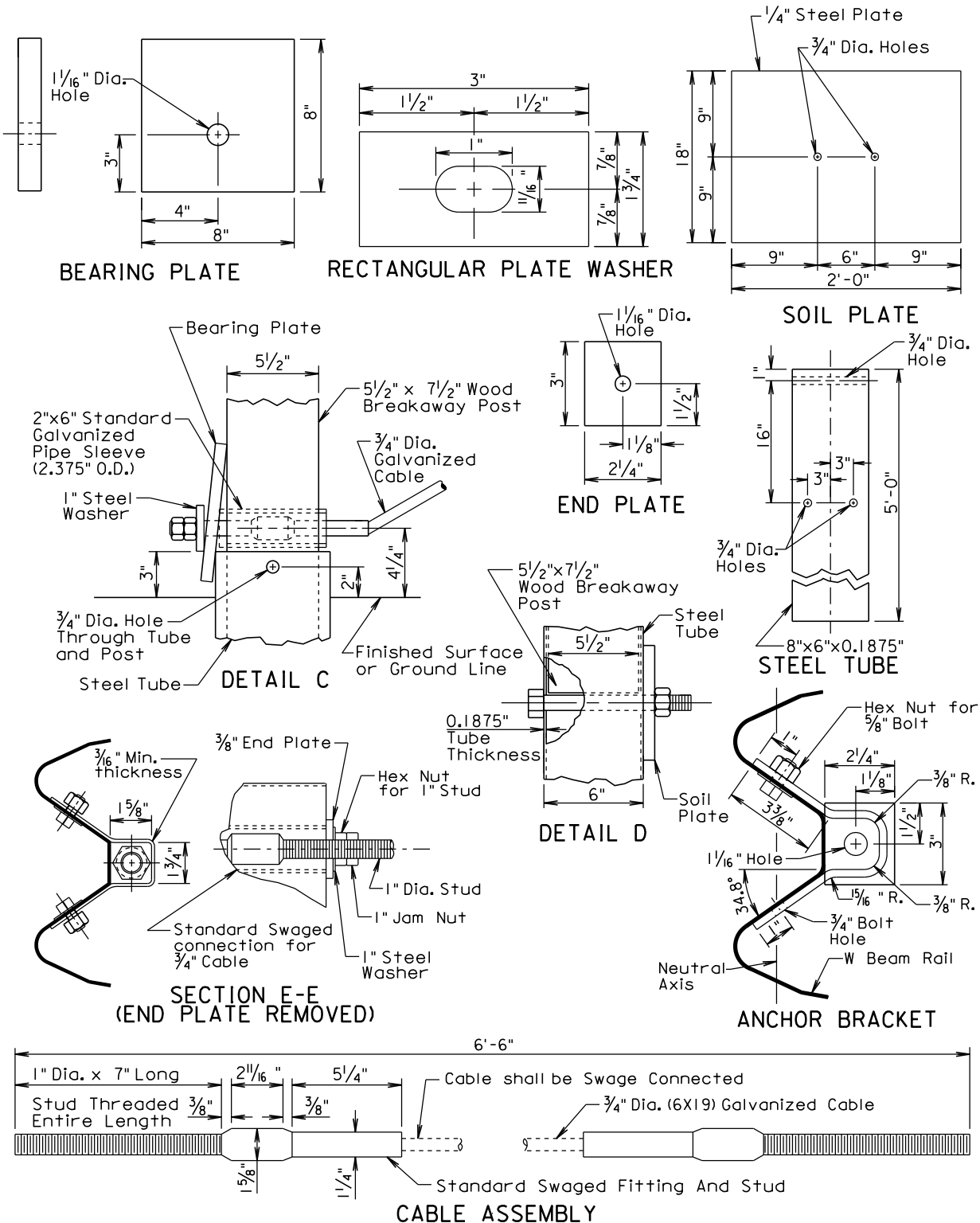
GUARDRAIL REPAIR

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December 16, 2014

Published Date: 2nd Qtr. 2016

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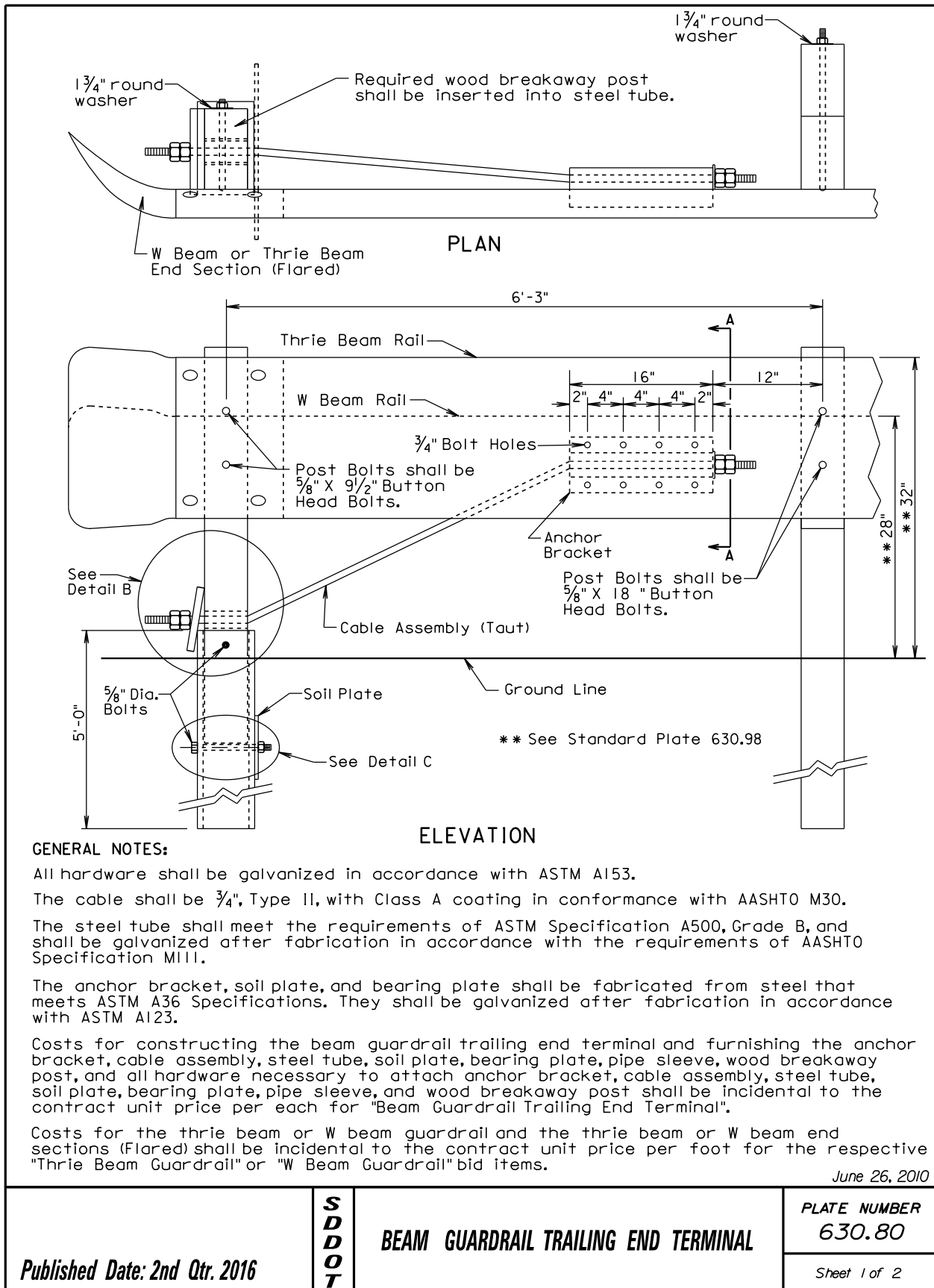
**W BEAM GUARDRAIL
BREAKAWAY CABLE TERMINAL**

**PLATE NUMBER
630.47**

Sheet 3 of 3

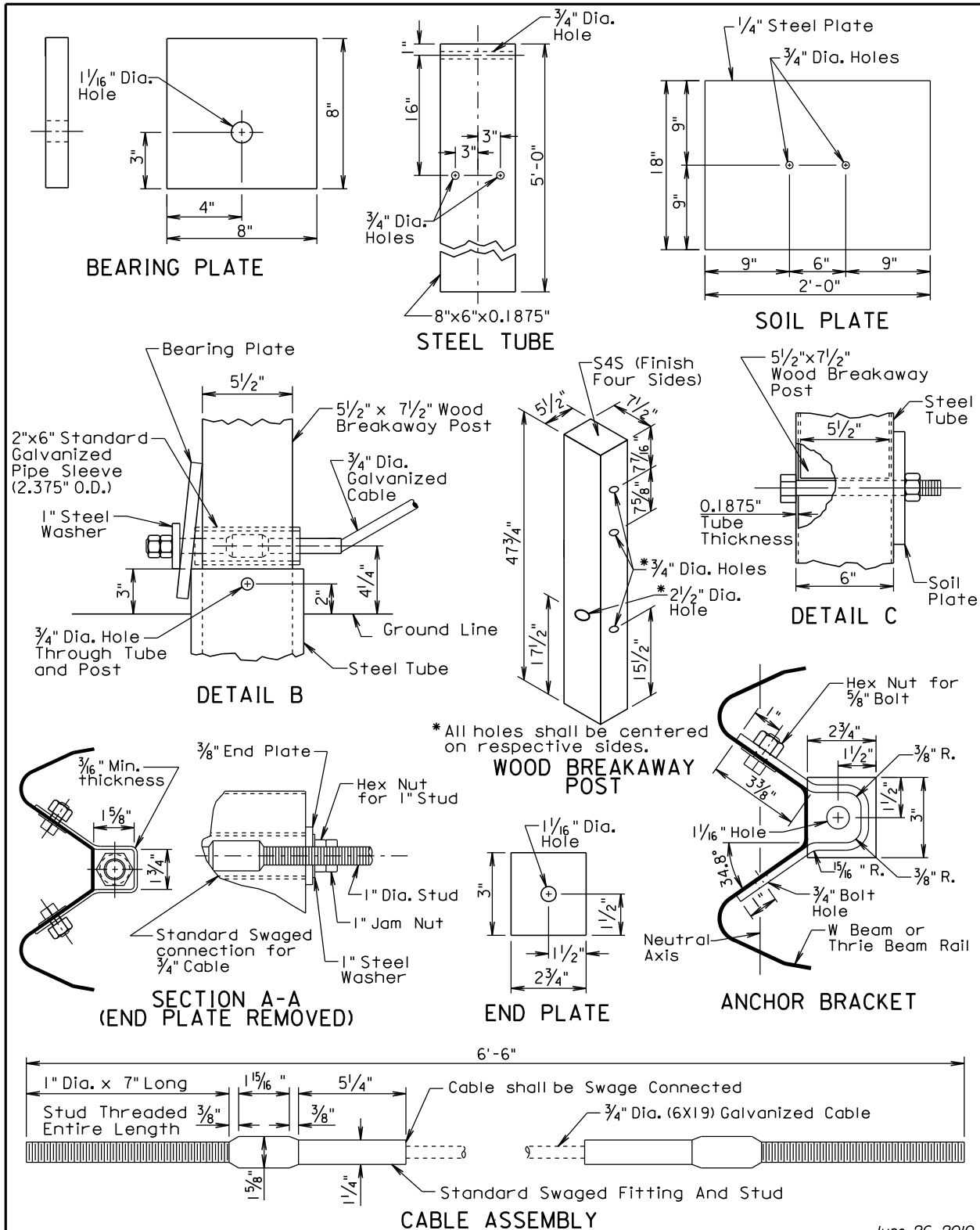
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June 26, 2010

Published Date: 2nd Qtr. 2016

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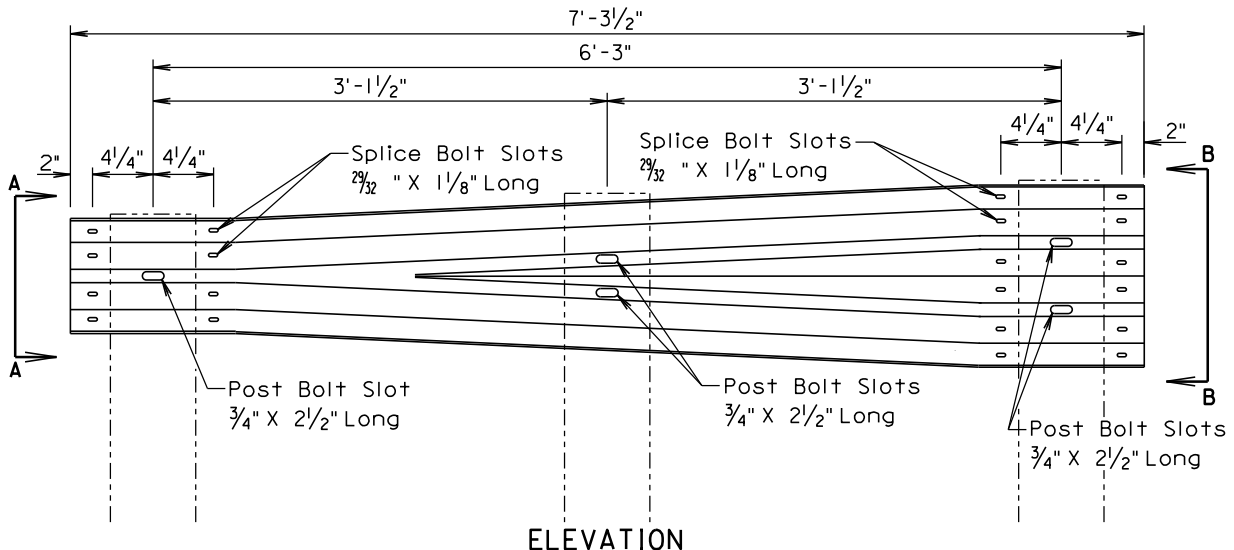
BEAM GUARDRAIL TRAILING END TERMINAL

PLATE NUMBER
630.80

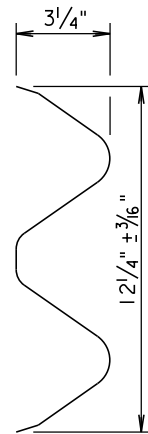
Sheet 2 of 2

GUARDRAIL REPAIR

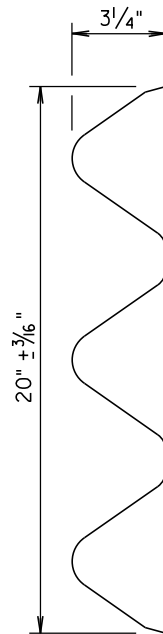
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ELEVATION



VIEW A-A



VIEW B-B

GENERAL NOTE:

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

March 31, 2000

Published Date: 2nd Qtr. 2016

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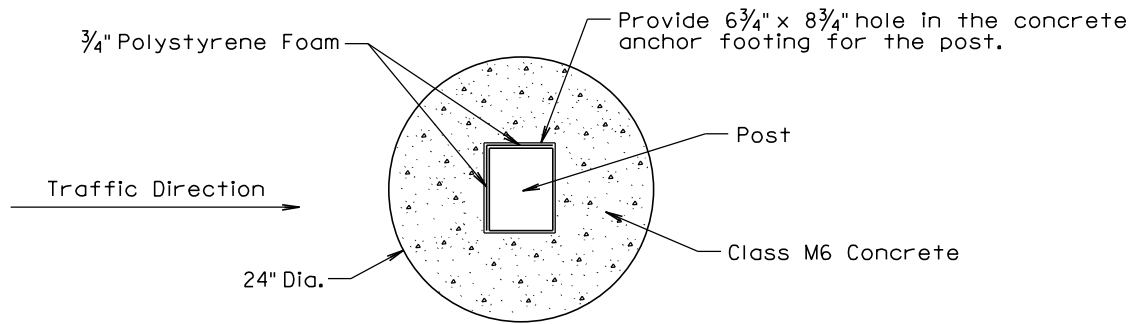
**W BEAM TO THRIE BEAM GUARDRAIL
TRANSITION SECTION**

**PLATE NUMBER
630.82**

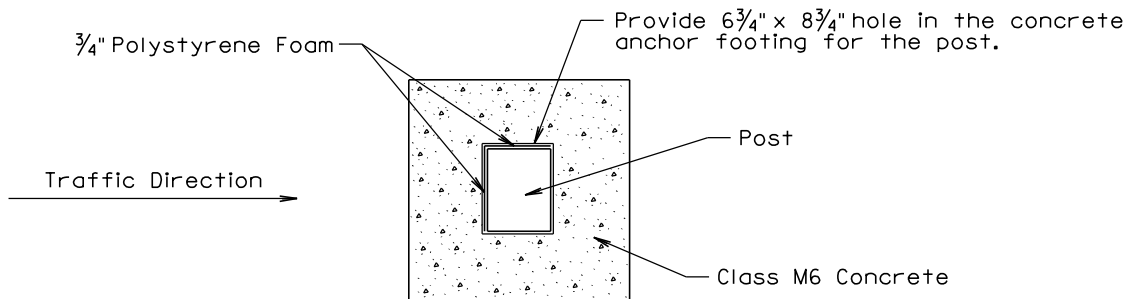
Sheet 1 of 1

GUARDRAIL REPAIR

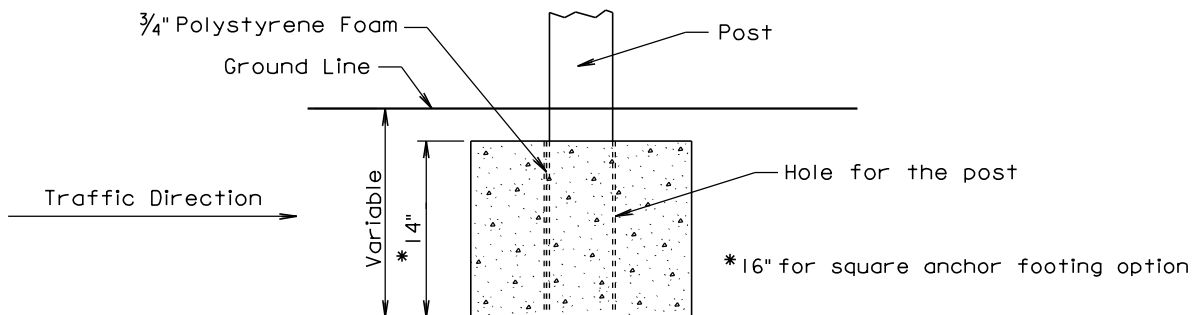
BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT,
HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



**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: 2nd Qtr. 2016

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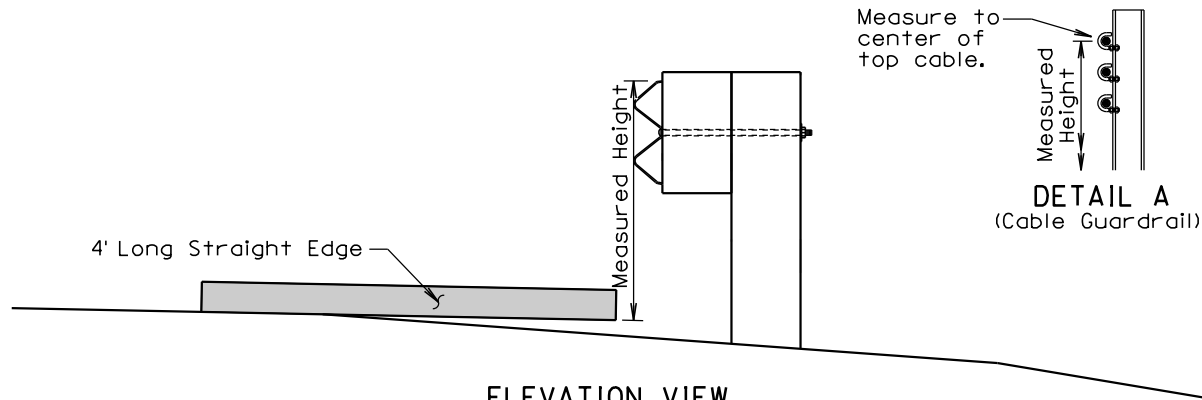
**CONCRETE ANCHOR FOOTING
FOR SHORT GUARDRAIL POST**

**PLATE NUMBER
630.84**

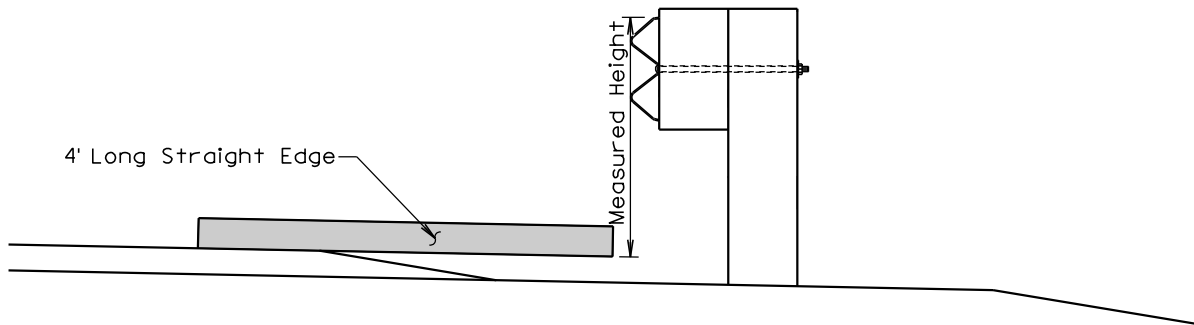
Sheet 1 of 1

GUARDRAIL REPAIR

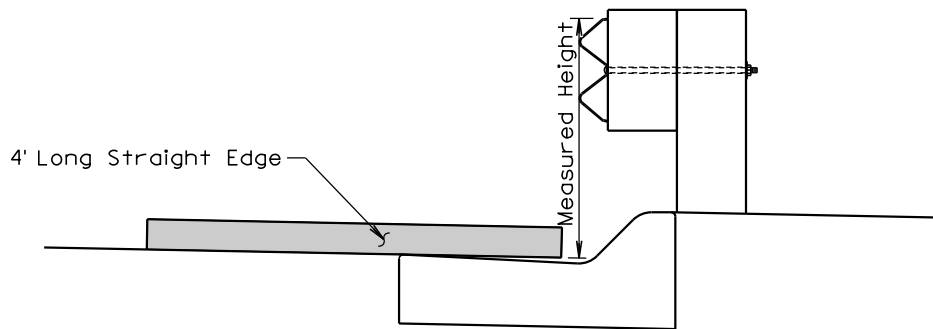
BEADLE, BROOKINGS, BROWN, BUFFALO, CLARK, CODINGTON, DAY, DEUEL, EDMUNDS, FAULK, GRANT, HAMLIN, HAND, HYDE, KINGSBURY, MCPHERSON, MARSHALL, MOODY, ROBERTS, AND SPINK COUNTIES



ELEVATION VIEW
(Guardrail Adjacent to Differential Slopes)



ELEVATION VIEW
(Guardrail Adjacent to Differential Surfacing Elevations)



ELEVATION VIEW
(Guardrail at Curb and Gutter)

GENERAL NOTES:

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

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

June 26, 2010

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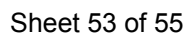
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MEASURING GUARDRAIL HEIGHT

PLATE NUMBER
630.98

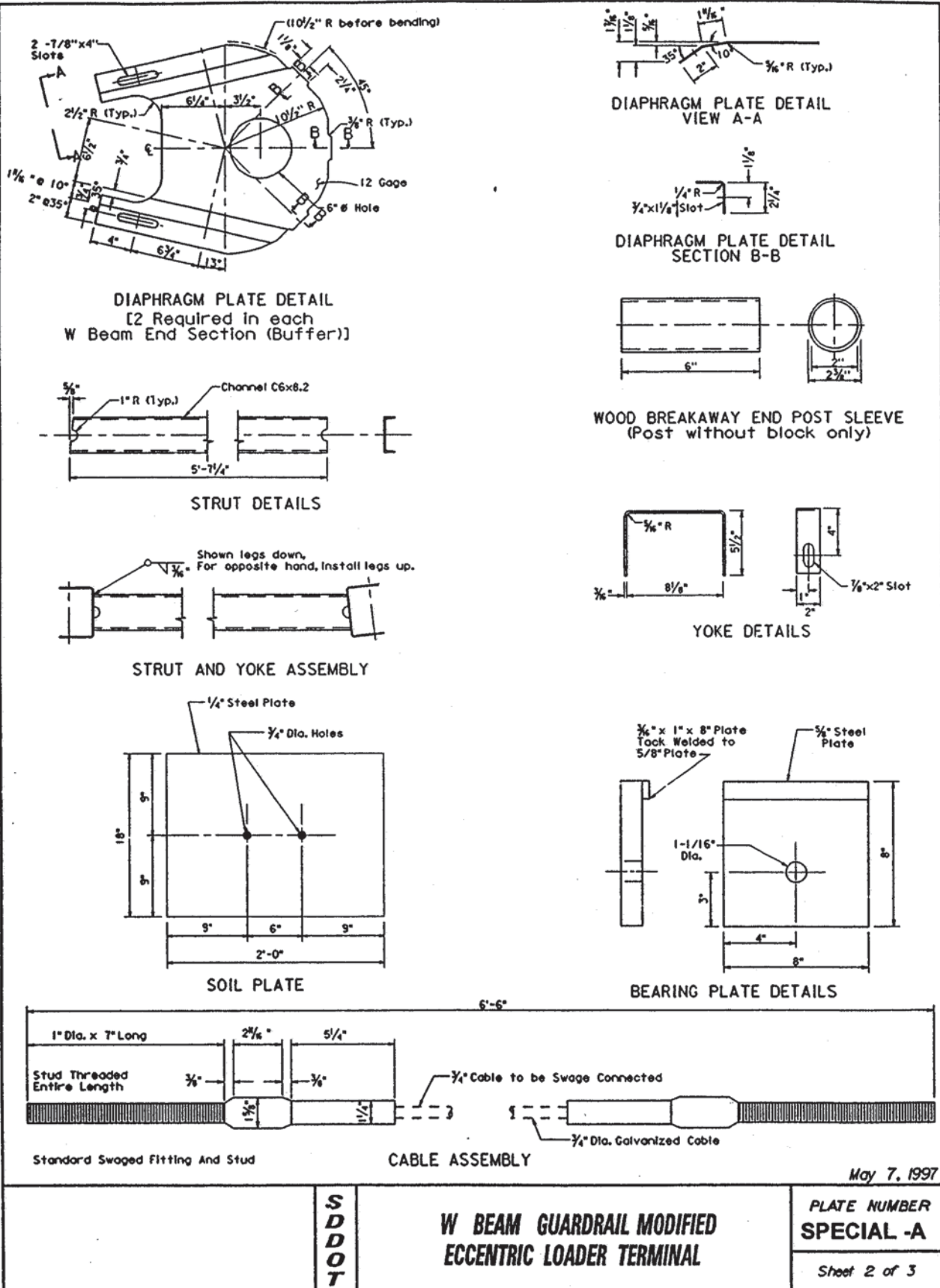
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GUARDRAIL ACCIDENT DAMAGE REPAIR

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GUARDRAIL ACCIDENT DAMAGE REPAIR

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