

Plot Scale - 1:200

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-391	1	36

Plotting Date: 05/05/2019



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

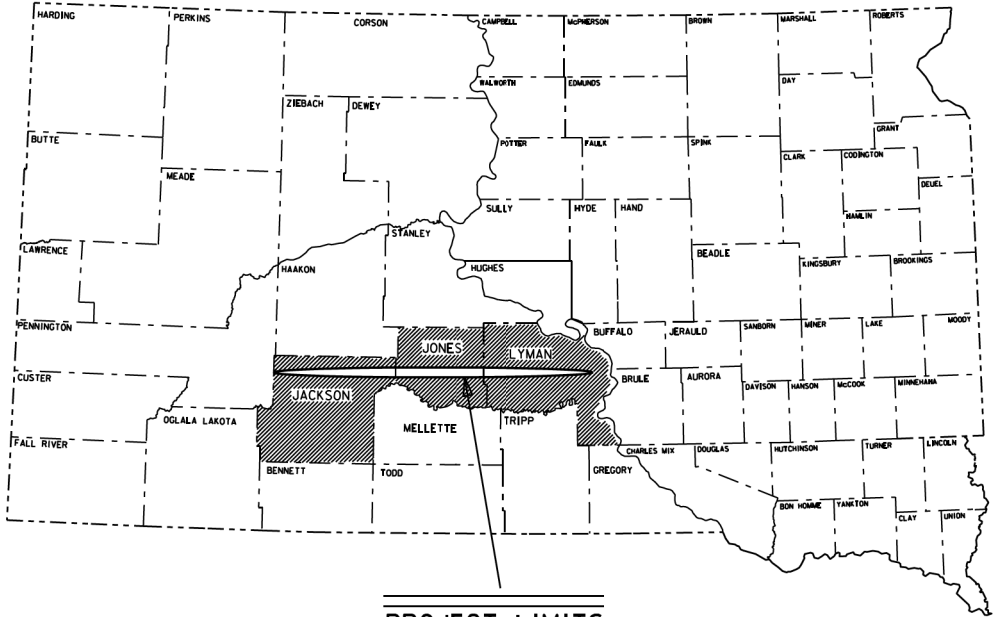
000I-391
INTERSTATE 90
JACKSON, JONES, & LYMAN COUNTIES

GUARDRAIL REPAIR AND/OR REPLACEMENT DUE TO DAMAGE ON INTERSTATE 90

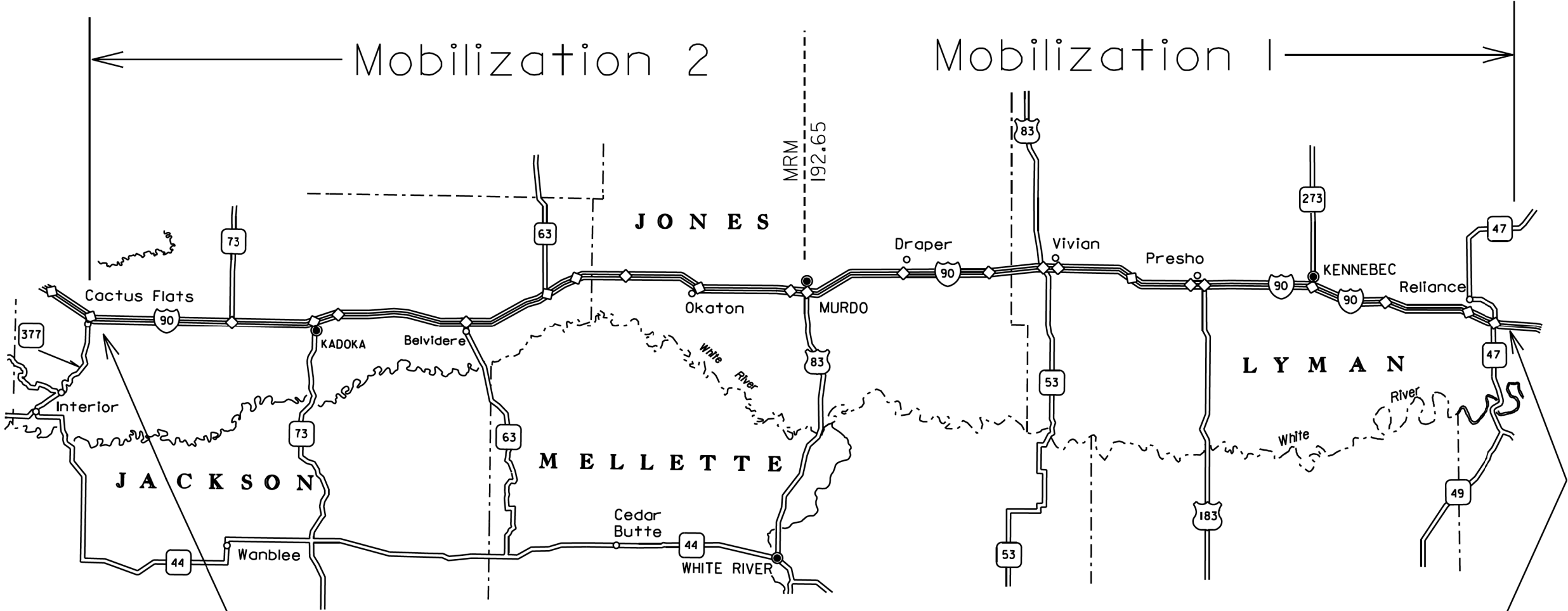
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PLAN SHEET INDEX

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Sheet 2	Estimate of Quantities
Sheets 3-6	Plan Notes
Sheets 7-11	Trinity CASS-S3 Manufacturer Plates
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PROJECT LIMITS



STORM WATER PERMIT
(None Required)

Start project at MRM 130.3

End project at MRM 251.6

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ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
* 009E0197	Mobilization 1	5	Each
* 009E0198	Mobilization 2	4	Each
* 110E0700	Remove 3 Cable Guardrail	200	Ft
* 110E0730	Remove Beam Guardrail	300.0	Ft
* 110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	1	Each
* 110E0790	Remove W Beam Guardrail Deformed End	1	Each
* 110E0800	Remove W Beam Guardrail End Terminal	1	Each
* 110E6000	Remove 3 Cable Guardrail for Reset	25	Ft
* 110E6210	Remove Thrie Beam Guardrail for Reset	25.0	Ft
* 110E6230	Remove W Beam Guardrail for Reset	25.0	Ft
* 110E6300	Remove Rubrail for Reset	25.0	Ft
* 120E0600	Contractor Furnished Borrow Excavation	25	CuYd
* 260E1090	Base Course, State Furnished	25.0	Ton
* 629E0225	Reset High Tension Cable Guardrail Terminal Post	5	Each
* 629E0300	3 Cable Guardrail Slip Base Anchor Assembly	1	Each
* 629E0400	3 Cable Guardrail Anchor Assembly	1	Each
* 629E0454	Retension High Tension 4 Cable Guardrail	2,000	Ft
* 629E1000	Repair 3 Cable Guardrail	4,000	Ft
* 629E1100	3 Cable Guardrail End Post	10	Each
* 629E1102	3 Cable Guardrail Intermediate Post	130	Each
* 629E1103	3 Cable Guardrail Slip Base Anchor Post	2	Each
* 629E1104	3 Cable Guardrail Post, Winter	75	Each
* 629E1106	Drive Down 3 Cable Guardrail Post	20	Each
* 629E1108	Reset 3 Cable Guardrail Post	25	Each
* 629E1110	Cable Anchor Bracket	1	Each
* 629E1112	Cable Splice	5	Each
* 629E1114	3 Cable Guardrail J Hook Bolt	400	Each
* 629E1117	Turnbuckle Assembly	5	Each
* 629E1118	Spring Cable End Assembly with Turnbuckle	10	Each
* 629E1120	W Beam to 3 Cable Transition Bracket	4	Each
* 629E1122	3 Cable Guardrail End Post Cap	7	Each
* 629E1144	High Tension 4 Cable Guardrail Post	20	Each
* 629E1159	High Tension 4 Cable Guardrail Post and Sleeve	5	Each
* 629E1164	High Tension 4 Cable Guardrail Sleeve	5	Each
* 629E1170	High Tension Cable Guardrail Terminal Post	5	Each
* 629E1174	Hardware for High Tension Cable Attachment to Terminal Post	5	Each
* 629E1175	Hardware for High Tension Cable Attachment to Post	40	Each
* 629E1180	High Tension Cable Guardrail Post Strap	15	Each
* 629E1181	High Tension Cable Guardrail Cable Spacer	15	Each
* 629E2115	Cable	50	Ft

* - Denotes Non-Participating

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
* 630E0200	Straight Class A Thrie Beam Rail	100.0	Ft
* 630E0210	Straight Class B Thrie Beam Rail	50.0	Ft
* 630E0500	Type 1 MGS	12.5	Ft
* 630E0520	Type 2 MGS	12.5	Ft
* 630E0530	Type 3 MGS	12.5	Ft
* 630E1200	Straight Class A W Beam Rail	175.0	Ft
* 630E1210	Straight Class B W Beam Rail	100.0	Ft
* 630E2000	W Beam to Thrie Beam Guardrail Transition	2	Each
* 630E2001	Asymmetrical W Beam to Thrie Beam Guardrail Transition	1	Each
* 630E2005	W Beam Guardrail to MGS Transition	1	Each
* 630E2010	W Beam Guardrail End Terminal	1	Each
* 630E2016	MGS Flared End Terminal	1	Each
* 630E2016	MGS Flared End Terminal	1	Each
* 630E2019	MGS Tangent End Terminal	1	Each
* 630E2019	MGS Tangent End Terminal	1	Each
* 630E2030	W Beam Guardrail Breakaway Cable Terminal	1	Each
* 630E2055	Thrie Beam Guardrail Trailing End Terminal	1	Each
* 630E2060	W Beam Guardrail Trailing End Terminal	1	Each
* 630E2065	MGS Trailing End Terminal	1	Each
* 630E2110	Beam Guardrail Post and Block	60	Each
* 630E2120	Beam Guardrail Post and Block, Winter	15	Each
* 630E2205	Breakaway Cable Terminal End Post	5	Each
* 630E2210	Breakaway Cable Terminal End Rail	3	Each
* 630E2215	W Beam Guardrail End Section Buffer	2	Each
* 630E5010	Reset Type 1 MGS	12.5	Ft
* 630E5020	Reset Type 2 MGS	12.5	Ft
* 630E5030	Reset Type 3 MGS	12.5	Ft
* 630E5120	Reset Thrie Beam Rail	25.0	Ft
* 630E5160	Reset W Beam Rail	25.0	Ft
* 630E5205	Reset MGS Flared End Terminal	1	Each
* 630E5206	Reset MGS Tangent End Terminal	1	Each
* 630E5220	Reset Rubrail	25.0	Ft
* 630E5520	Drive Down Beam Guardrail Post	10	Each
* 630E5530	Remove and Reset Beam Guardrail Post and Block	10	Each
* 632E2220	Guardrail Delineator	10	Each
* 634E0010	Flagging	10.0	Hour
* 634E0110	Traffic Control Signs	1,298.0	SqFt
* 634E0120	Traffic Control, Miscellaneous	1	LS
* 634E0275	Type 3 Barricade	8	Each
* 634E0420	Type C Advance Warning Arrow Board	1	Each
* 910E1070	Labor and Equipment	5	Hour

* - Denotes Non-Participating

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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

The SDDOT is committed to protecting the environment and uses Section A Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified 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.

Additional guidance on SDDOT's Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <http://www.sddot.com/resources/Manuals/EnvironProcManual.pdf>

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Office at 605-773-3098 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

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

Action Taken/Required:

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

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

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

COMMITMENT H: WASTE DISPOSAL SITE

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

Action Taken/Required:

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

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

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

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

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

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

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

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

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

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

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.

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**COMMITMENT I: HISTORICAL PRESERVATION OFFICE
CLEARANCES – Continued**

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.

COMPLETION DATE

The contract will become effective on July 1, 2019 and will expire on June 15, 2020.

SCOPE OF WORK

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

MOBILIZATION

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

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

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

PROGRESS PAYMENTS

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

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

UTILITIES

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

GENERAL MAINTENANCE OF TRAFFIC

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

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

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

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

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

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

GENERAL GUARDRAIL REPAIR

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

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HIGH TENSION GUARDRAIL - Continued

High Tension Guardrail Bid Items

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

**High Tension Guardrail Bid Items
Payment Information Explanation**

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

12. This bid item is specific to products from Trinity known as the CASS high tension cable barrier. This part typically has white or yellow reflectorized delineation on it. Use this item when only the cable spacer needs to be replaced. This part would be included in the price of the post if a new post is needed. Payment includes cost for furnishing and installing the high tension cable guardrail cable spacer, labor, equipment, and incidentals.
 13. This bid item will be used for furnishing and installing cable for high tension (prestretched) or low tension (prestretched or non-pre-stretched) cable guardrail for a typical repair if a cable is damaged and a new piece needs to be installed. Payment for each cable includes cost for cutting the cable as necessary, furnishing and installing the cable, labor, equipment, and incidentals.
- GUARDRAIL**
1. When guardrail adjoining bridge ends is ordered to be repaired, the contractor will replace with the same size and type as existing type of guardrail. Post spacing will be in accordance with current specifications. See the Department's 630 Standard Plate Series for post spacing and post length requirements included in these plans or at the Department's website @ : <http://www.sddot.com/business/design/plates/index/Default.aspx>.
 2. When the SDDOT instructs the Contractor to replace a W Beam guardrail end terminal, the new W Beam guardrail end terminal shall be of the same type (flared or tangent) that was originally installed. The costs for furnishing and installing the tangent and flared W Beam guardrail end terminals shall be incidental to the contract unit price per each for "W Beam Guardrail End Terminal". All W Beam guardrail end terminals that are replaced shall be selected from the South Dakota Department of Transportation Approved Product List.
 3. When the SDDOT instructs the Contractor to replace an MGS guardrail end terminal, the new MGS guardrail end terminal shall be of the same type (flared or tangent) that was originally installed. The costs for furnishing and installing the tangent and flared MGS guardrail end terminals shall be incidental to the contract unit price per each for "MGS End Terminal". All MGS guardrail end terminals that are replaced shall be selected from the South Dakota Department of Transportation Approved Product List.
 - 4.
 5. 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.

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GUARDRAIL-Continued

6. "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.
7. "3 Cable Guardrail Post, Winter" is the additional cost for removal and installation of a 3 Cable Guardrail Post (I Beam or Flanged Channel) when there is in excess of one foot solid frozen ground at the work site. This contract unit price will be an additional payment for each post installed under these conditions.
8. "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.
9. "Repair 3 Cable Guardrail" includes the cost for replacing and repairing damaged cable, realigning posts, and the tensioning of the entire run of three cable guardrail. Payment for this item is applicable only when broken cable is repaired or the existing cable rail requires realigning and tensioning.
10. "3 Cable Guardrail Intermediate Post" includes the cost for both I Beam and Flanged type of posts. The post for this item shall be furnished and installed consistent with the type of posts presently in place at the proposed repair site.
11. "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.
12. 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.

LABOR AND EQUIPMENT

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

BASE COURSE, STATE FURNISHED

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

Base Course State Furnished will be available from the SDDOT Maintenance Yards located at Kadoka, legal description of NW1/4, Section 32, T2S, R22E; (Exit 150) and Reliance, legal description of SW1/4, Section 35, T105N, R73W; (Exit 250). This material can be used without testing.

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

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

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

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

CONTRACTOR FURNISHED BORROW EXCAVATION

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

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

RESTORATION OF DISTURBED AREAS

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

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET 6	TOTAL SHEETS 36
	0001-391		

Plotting Date: 05/05/2019

ITEMIZED LIST OF TRAFFIC CONTROL DEVICES

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	0001-391 PCN i4jn			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W4-2	LEFT or RIGHT LANE ENDS (symbol)	2	48" x 48"	16.0	32.0
W7-3aP	NEXT ___ MILES (plaque)	2	36" x 30"	7.5	15.0
W13-1P	ADVISORY SPEED (plaque)	2	30" x 30"	6.3	12.6
W20-1	ROAD WORK AHEAD	3	48" x 48"	16.0	48.0
W20-5	LEFT or RIGHT LANE CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
W21-5a	LEFT or RIGHT SHOULDER CLOSED	2	48" x 48"	16.0	32.0
W21-5b	LEFT or RIGHT SHOULDER CLOSED AHEAD	2	48" x 48"	16.0	32.0
G20-2	END ROAD WORK	3	48" x 24"	8.0	24.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			259.6

ARROW BOARDS

ITEM DESCRIPTION	QUANTITY
Type C Advance Warning Arrow Board	1 Each

File - ...15FQ Note and SP Drawings.dgn

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	7	36

Plotting Date: 03/25/2018

NOTES:

- CASS-S3 4-CABLE (4:1) HAS BEEN SUCCESSFULLY TESTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 **TEST LEVEL 3** (NCHRP 350 TL3) **WHEN INSTALLED ON A 4:1 OR FLATTER SLOPE**. CASS-S3 4-CABLE (4:1) HAS BEEN SUCCESSFULLY TESTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 **TEST LEVEL 4** (NCHRP 350 TL4) **WHEN INSTALLED ON A 6:1 OR FLATTER SLOPE**. **THIS CABLE BARRIER SYSTEM HAS BEEN ASSIGNED FHWA ACCEPTANCE LETTER NUMBER B-141F. AS OF JANUARY 12TH, 2010, IT IS CONSIDERED "FHWA ACCEPTANCE PENDING", FOR VARIOUS POST SPACINGS.**
- CASS CABLE TERMINAL (CCT) HAS BEEN SUCCESSFULLY TESTED AND ACCEPTED TO NCHRP TL3. AN NCHRP 350 TL3 APPROVED TERMINAL (CCT) OR CASS-S3 4-CABLE (4:1) TRANSITION (VARIOUS) SHALL BE USED ON APPROACH AND DEPARTURE TERMINATIONS WHEN CASS-S3 4-CABLE (4:1) IS INSTALLED ON THE NATIONAL HIGHWAY SYSTEM (NHS). IF THE TERMINATION POINT IS LOCATED OUTSIDE THE CLEAR ZONE AND/OR PROTECTED BY OTHER MEANS (CRASHWORTHY BARRIER, TERMINALS, ETC.), A NON-NCHRP 350 TL3 ANCHOR (CCA) MAY BE USED ON APPROACH AND DEPARTURE TERMINATIONS.
- 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".
- 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.
- 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.
- FOR AESTHETIC PURPOSES TRINITY RECOMMENDS ALL SLEEVES, DRIVEN POSTS, AND LOWER CABLE RELEASE POSTS TO BE INSTALLED REASONABLY PLUMB (APPROXIMATELY 1/8" PER FOOT).
- 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.
- 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.
- PLEASE SEE SPECIFYING AGENCY (OR MUTCD) FOR PROPER "BARRIER" DELINEATION.
- PLEASE CONTACT TRINITY OR CONSULT THE DESIGN, INSTALLATION, OR REPAIR MANUAL(S) FOR ADDITIONAL INFORMATION.

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

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

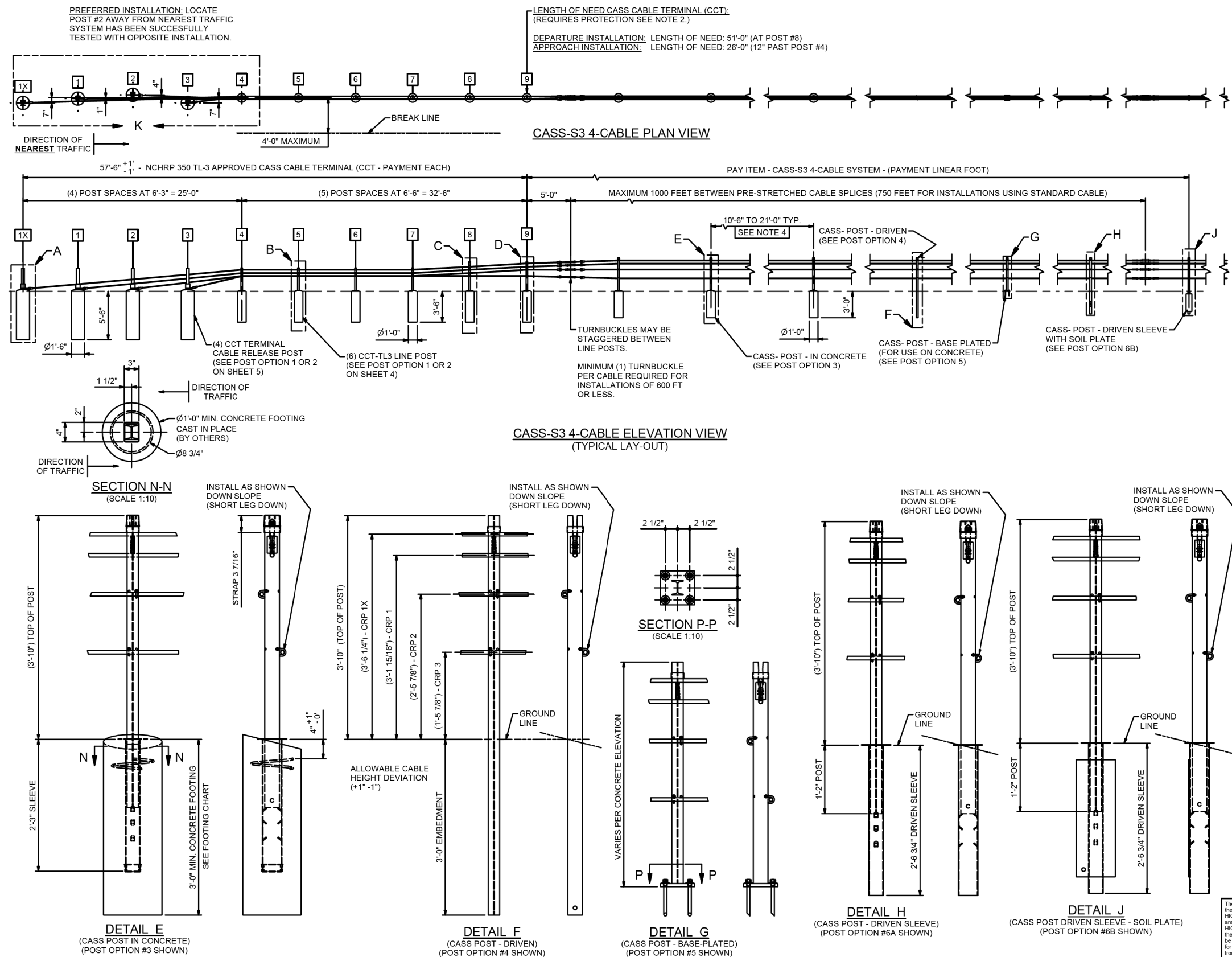
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PROJ. CASS-S3

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

TRINITY HIGHWAY
PRODUCTS, LLC

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



Plot Scale - 1:200

TRINITY 11/18/2018

Plotted From -

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	8	36

Plotting Date: 03/25/2018

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

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

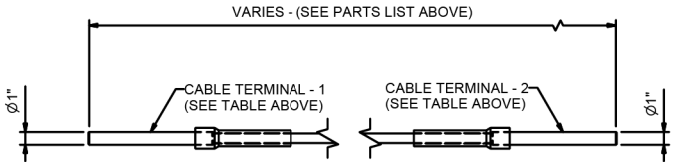
PARTS LIST - CASS-S3 POST BASE-PLATED - OPTION #5			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 DIA. HEX NUT (A563)	0.01
4	3300G	5/8" PLAIN WASHER - TYPE B - R - (F844)	0.06
4	3310G	5/8 LOCK WASHER	0.00
4	3361G	5/8" HEX NUT (A563 Gr DH)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
4	5225G	5/8 x 7 1/2" HAS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

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

PARTS LIST - PRE-STRETCHED CABLE ASSEMBLIES					
QTY	PART No	TITLE	LENGTH	TERM-1	TERM-2
1	5817	CCT CABLE ASSEMBLY-TOP	54'-4"	R.H.T.	L.H.T.
1	5818	CCT CABLE ASSEMBLY-MID	48'-1"	R.H.T.	L.H.T.
1	5819	CCT CABLE ASSEMBLY-BOT	41'-10"	R.H.T.	L.H.T.
1	5867	CCA CABLE ASSEMBLY	25'-0"	R.H.T.	L.H.T.
1	5816	CABLE ASSEMBLY-INTERIOR	1000'	R.H.T.	L.H.T.
1	5753	CABLE FIELD SPLICE SECTION	1025'	R.H.T.	NONE
1	5752	CABLE FIELD SPLICE SECTION	1000'	R.H.T.	NONE
1	5758	CABLE FIELD SPLICE SECTION	975'	R.H.T.	NONE
1	5797	CABLE FIELD SPLICE SECTION	950'	R.H.T.	NONE
1	5796	CABLE FIELD SPLICE SECTION	925'	R.H.T.	NONE
1	5795	CABLE FIELD SPLICE SECTION	900'	R.H.T.	NONE
1	5794	CABLE FIELD SPLICE SECTION	875'	R.H.T.	NONE
1	5793	CABLE FIELD SPLICE SECTION	850'	R.H.T.	NONE
1	5792	CABLE FIELD SPLICE SECTION	825'	R.H.T.	NONE
1	5791	CABLE FIELD SPLICE SECTION	800'	R.H.T.	NONE
1	5790	CABLE FIELD SPLICE SECTION	775'	R.H.T.	NONE
1	5789	CABLE FIELD SPLICE SECTION	750'	R.H.T.	NONE
1	5788	CABLE FIELD SPLICE SECTION	725'	R.H.T.	NONE
1	5787	CABLE FIELD SPLICE SECTION	700'	R.H.T.	NONE
1	5786	CABLE FIELD SPLICE SECTION	675'	R.H.T.	NONE
1	5785	CABLE FIELD SPLICE SECTION	650'	R.H.T.	NONE
1	5784	CABLE FIELD SPLICE SECTION	625'	R.H.T.	NONE
1	5783	CABLE FIELD SPLICE SECTION	600'	R.H.T.	NONE
1	5782	CABLE FIELD SPLICE SECTION	575'	R.H.T.	NONE
1	5781	CABLE FIELD SPLICE SECTION	550'	R.H.T.	NONE
1	5780	CABLE FIELD SPLICE SECTION	525'	R.H.T.	NONE
1	5779	CABLE FIELD SPLICE SECTION	500'	R.H.T.	NONE
1	5778	CABLE FIELD SPLICE SECTION	475'	R.H.T.	NONE
1	5776	CABLE FIELD SPLICE SECTION	450'	R.H.T.	NONE
1	5775	CABLE FIELD SPLICE SECTION	425'	R.H.T.	NONE
1	5769	CABLE FIELD SPLICE SECTION	400'	R.H.T.	NONE
1	5768	CABLE FIELD SPLICE SECTION	375'	R.H.T.	NONE
1	5767	CABLE FIELD SPLICE SECTION	350'	R.H.T.	NONE
1	5766	CABLE FIELD SPLICE SECTION	325'	R.H.T.	NONE
1	5765	CABLE FIELD SPLICE SECTION	300'	R.H.T.	NONE
1	5764	CABLE FIELD SPLICE SECTION	275'	R.H.T.	NONE
1	5763	CABLE FIELD SPLICE SECTION	250'	R.H.T.	NONE
1	5762	CABLE FIELD SPLICE SECTION	225'	R.H.T.	NONE
1	5761	CABLE FIELD SPLICE SECTION	200'	R.H.T.	NONE
1	5760	CABLE FIELD SPLICE SECTION	175'	R.H.T.	NONE
1	5759	CABLE FIELD SPLICE SECTION	150'	R.H.T.	NONE
1	5758	CABLE FIELD SPLICE SECTION	125'	R.H.T.	NONE
1	5757	CABLE FIELD SPLICE SECTION	100'	R.H.T.	NONE
1	5756	CABLE FIELD SPLICE SECTION	75'	R.H.T.	NONE
1	5755	CABLE FIELD SPLICE SECTION	50'	R.H.T.	NONE
1	5754	CABLE FIELD SPLICE SECTION	25'	R.H.T.	NONE
1	5840	CABLE FIELD REPAIR SECTION	5'	R.H.T.	L.H.T.

NOTE:

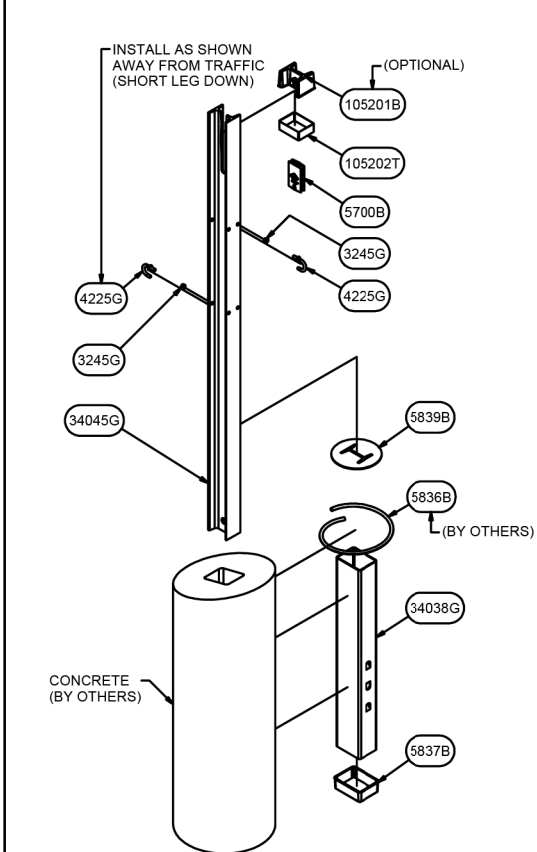
FOR THE STANDARD FIELD SPLICE SECTIONS ABOVE, SUPPLY (1) RIGHT HAND THREADED STUD ASSEMBLY 5910G EACH.



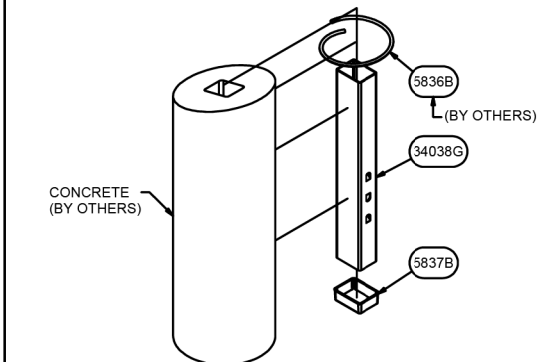
PRE-STRETCHED CABLE ASSEMBLY

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 SPLICE AND CASS-TL3 POST, SUPPLY A SPLICE INTERFERENCE POST AND SUPPORT THE TURNBUCKLE ASSEMBLY TO THE CASS-TL3 POST BY USE OF A MODIFIED STRAP (5707T) AND 5/16" HARDWARE (4211G BOLT, 3245G NUT). CONTACT TRINITY FOR DETAILS. LONG SPLICE POST 34041G IN LIEU OF LONG CASS-TL3 (4:1) POST 34012G SHORT SPLICE POST 34040G IN LIEU OF SHORT CASS-TL3 (4:1) POST 34007G
- IF REQUIRED PER PROJECT PLANS SUPPLY:
CABLE PULLING TOOL 5850B
CABLE TENSION METER 5878B
CABLE THERMOMETER 5709B

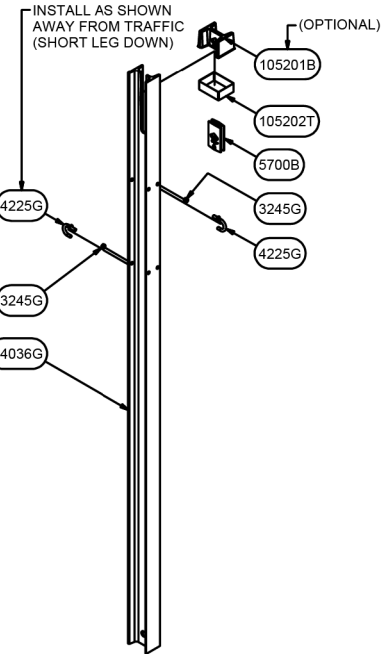


CASS-S3 POST - IN CONCRETE
(POST OPTION #3 - CAST IN PLACE)

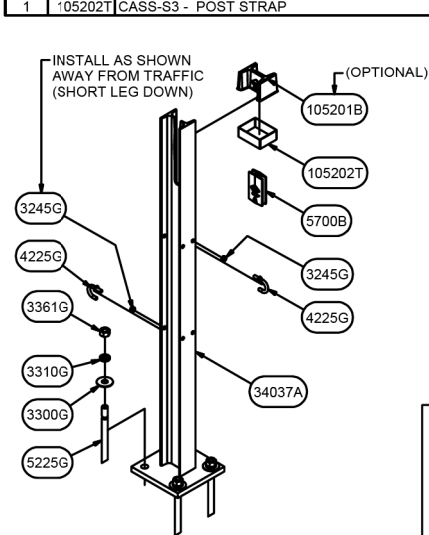


CONCRETE FOOTING ASSEMBLY
(POST OPTION #3 - PRE-CAST OPTION)

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



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

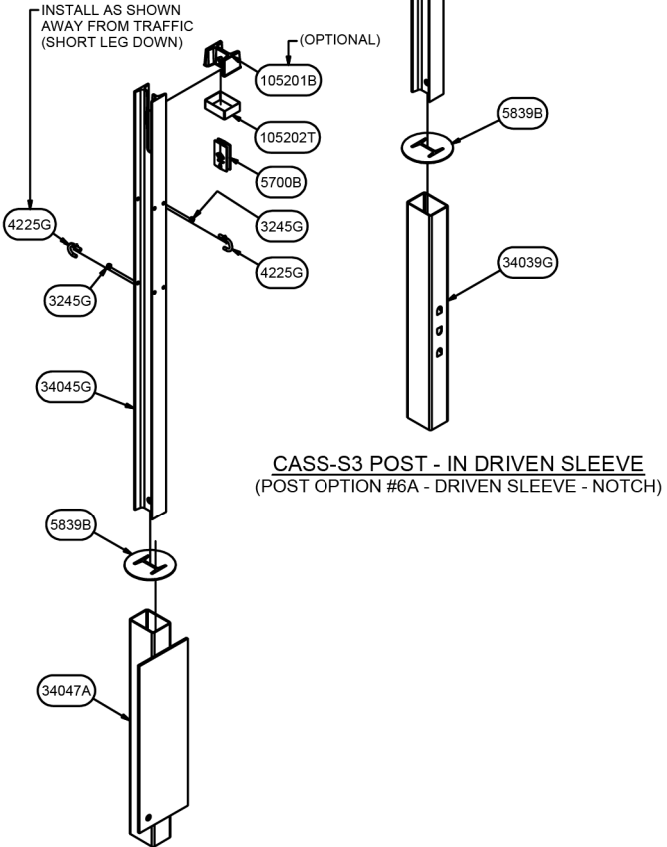


CASS-S3 POST - BASE-PLATED
(POST OPTION #5 - BASE-PLATED)

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 8" ALL THREADED ROD (A449) WITH EPOXY.
(4 EACH 3300G, 3310G, 3361G & 6722G) & 0.6 EACH 5448B
- 5/8 MECHANICAL ANCHOR. (BY OTHERS)



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

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

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PROJ: CASS-S3

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

TRINITY HIGHWAY
PRODUCTS, LLC

SPEC:

SHIPPING WT:

DRW: E.A.S. 1/25/2010

CHK: G.N. 1/25/2010

SHT: 2 OF 5

SIZE: D

DWG NO:

REV

SS-742 0

Plot Scale - 1"=200'

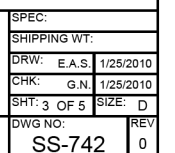
TRINITY118728

Plotted From -

File - ...\\trinity\\data\\plans\\ss742\\ss742.dwg

Plot Scale = 1:200

File: SS-742 TL3 S3 4T1 4C.idw





Plot Scale - 1/200

Plotted From - TRM1118726

File: SS-742_TL3_S3_4T1_4C.dwg

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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	11	36

Plotting Date: 02/25/2018

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

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

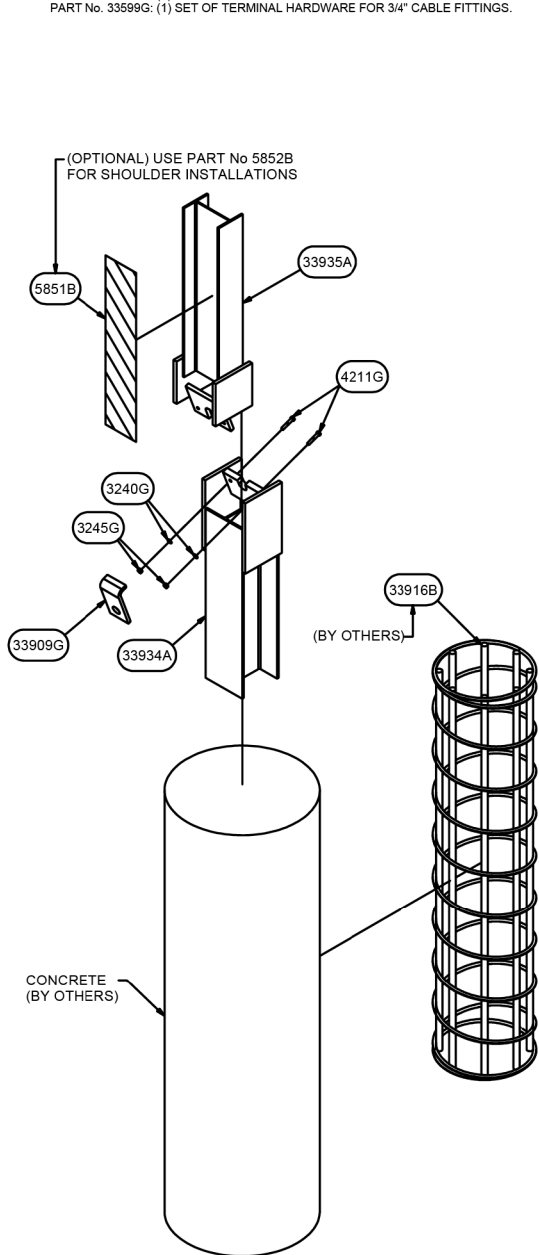
PART No. 33598G: (1) SET OF TERMINAL HARDWARE FOR 1" CABLE FITTINGS.
PART No. 33599G: (1) SET OF TERMINAL HARDWARE FOR 3/4" CABLE FITTINGS.

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

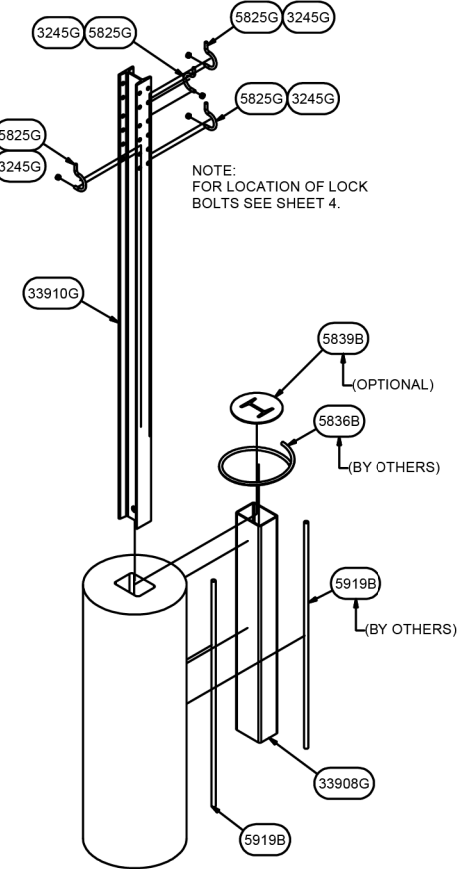
PARTS LIST - CCT CABLE RELEASE POST No. 1-3 - DRIVEN			
QTY	PART No	TITLE	Lbs / Each
2	3240G	5/16 FLAT WASHER (F844)	0.00
2	3245G	5/16 HEX NUT (A563)	0.01
2	4211G	5/16 HEX BOLT x 1 3/4" (A307)	0.05
1	5851B	REFLECTOR - MEDIAN - YELLOW	0.10
1	33909G	CASS CABLE BRACKET	1.92
1	33935A	CRP - UPPER POST	31.57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

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

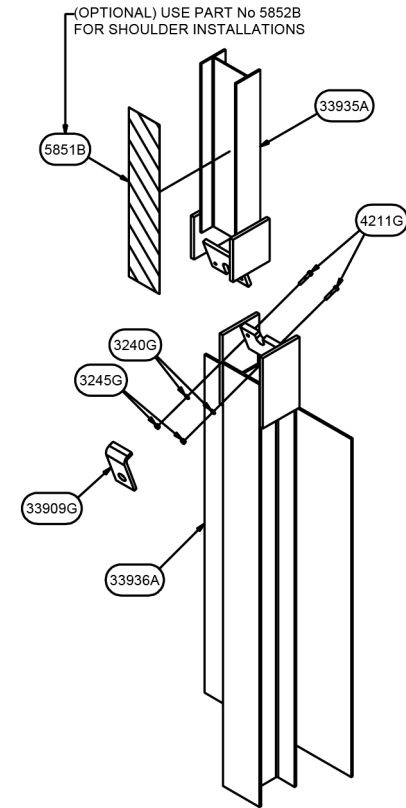
PARTS LIST - CCT TERMINAL POST No. 5-9 - WITH SOIL PLATE			
QTY	PART No	TITLE	Lbs / Each
3	3245G	5/16 DIA. HEX NUT (A563)	0.01
3	5825G	CABLE LOCK BOLT (A307)	0.12
1	33903A	350-TL3 TERMINAL POST w/ SOIL PLATE	42.25



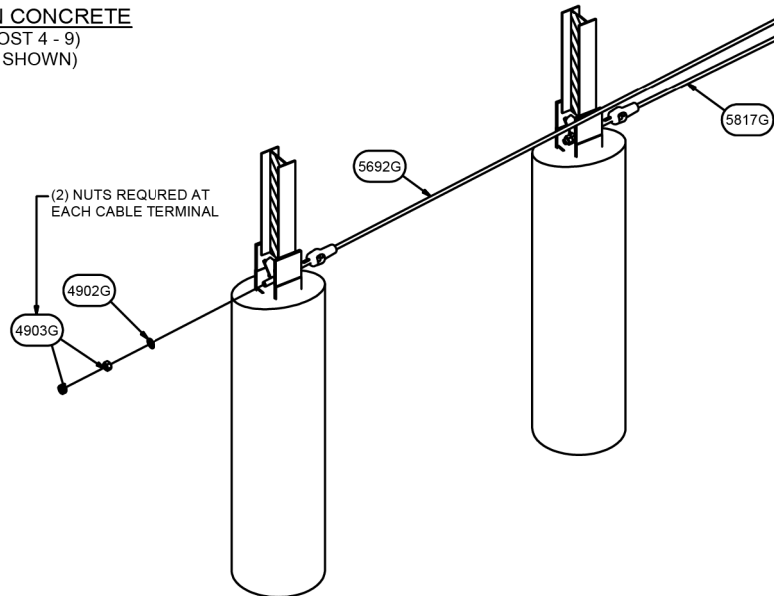
CRP TERMINAL POST - IN CONCRETE
(CCT TERMINAL POST 1X - 3)
(POST OPTION #1 SHOWN)



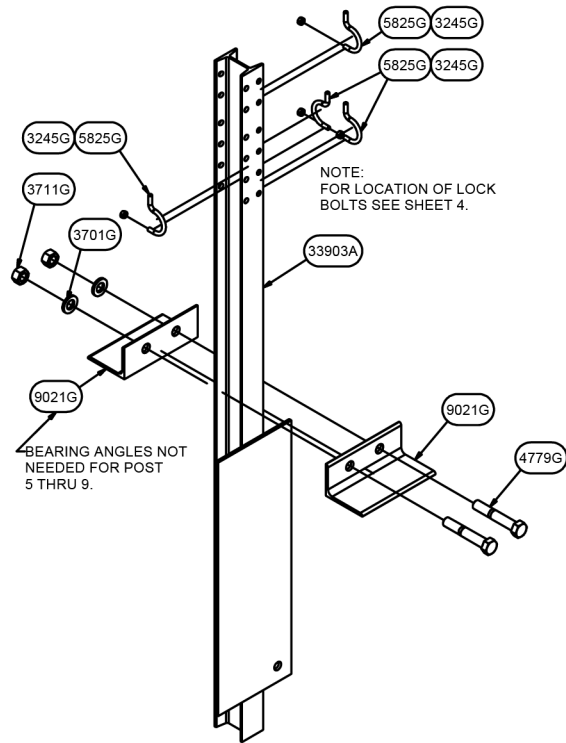
TERMINAL POST - IN CONCRETE
(CCT TERMINAL POST 4 - 9)
(POST OPTION #1 SHOWN)



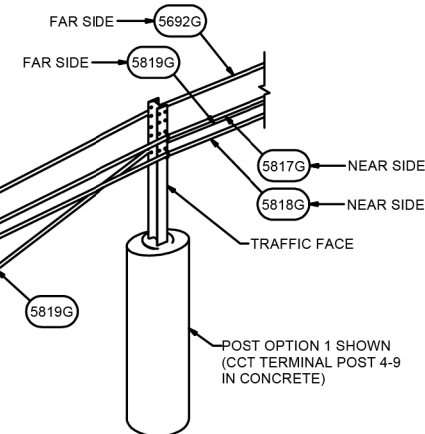
CRP TERMINAL POST - DRIVEN
(CCT TERMINAL POST 1X - 3)
(POST OPTION #2 SHOWN)



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



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



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

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PROJ: CASS-S3

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

TRINITY HIGHWAY
PRODUCTS, LLC

SPEC:
SHIPPING WT:
DRW: E.A.S. 1/25/2010
CHK: G.N. 1/25/2010
SHT: 5 OF 5
REV: D
SS-742 0

Plotting Date: 05/05/2019

GENERAL NOTES:

Either flanged channel steel posts or S3x5.7 steel I beam posts will be used, but post type will be consistent throughout the project. The S3x5.7 steel I beam post will 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 will 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 will be incidental to the contract unit price per foot for "3 Cable Guardrail".

The following table and criteria will 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 will 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 will 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 will have a total available travel of 6 inches minimum.

The cable will 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)	4¼	4	3¾	3½	3¼	3	2¾	2½	2¼	2	1¾	1½	1¼	1

POST SPACING FOR HORIZONTAL CURVES	
Roadway C _r 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

September 14, 2018

Published Date: 2nd Qtr. 2019

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3 CABLE GUARDRAIL (LOW TENSION)

PLATE NUMBER
629.01

Sheet 1 of 6

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

**** See Standard Plate 630.99**

See Detail A, B, —
and General Notes

Installation Line—

See Detail H for typical connection to cable anchor bracket

Costs (See Detail D)

2 Typical Wedge

N-2-
(See Detail C)

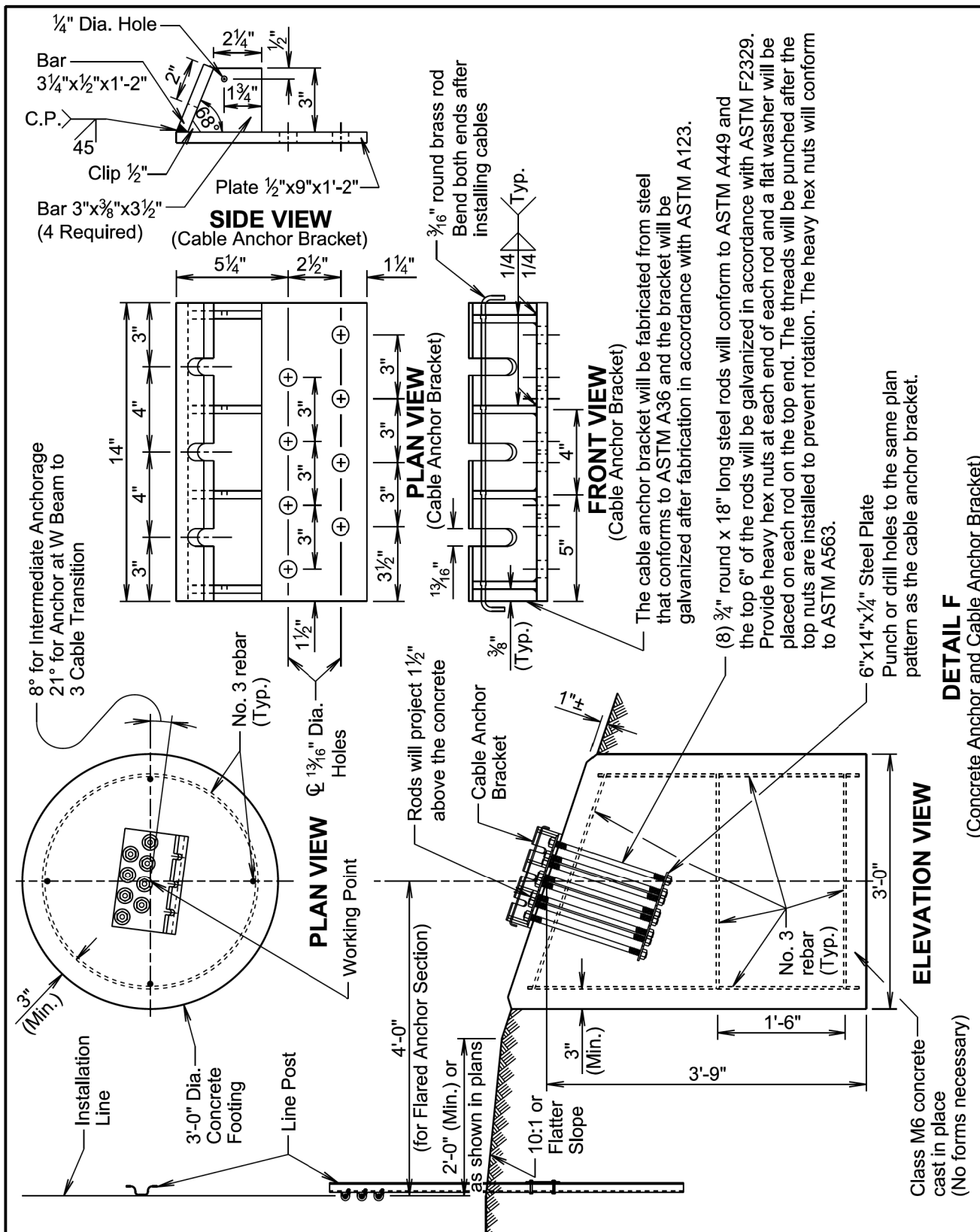
3 1/2"

3 1/2"

ABLE SPLICE

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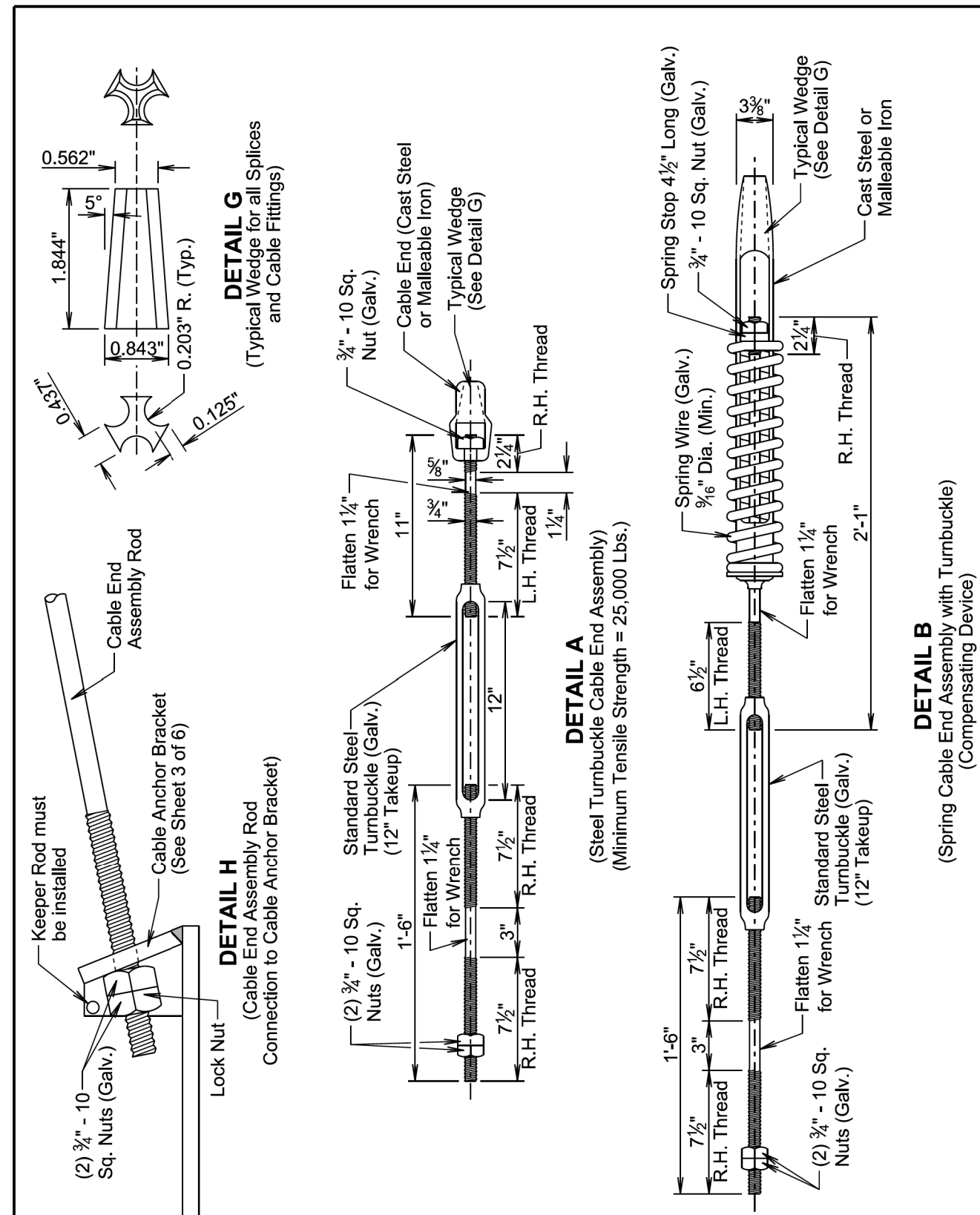
Plotting Date: 05/05/2019



September 14, 2018

PLATE NUMBER
629.01

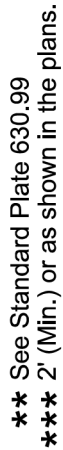
Sheet 3 of 6



September 14, 2018

PLATE NUMBER
629.01

Sheet 4 of 6



1 3/16" Dia. holes for ASTM A307 Galvanized
3/4" bolts 4 1/2" long with nuts and washers.
After post is driven the bolts will be torqued to
100 ± 20 Ft.Lbs.

September 14, 2018

PLATE NUMBER
629.01

Sheet 5 of 6

S3x5.7 STEEL I BEAM POST FOR 3 CABLE GUARDRAIL

☒ Alternate Type Hook Bolt



*** 2' (Min.) or as shown in

$\frac{5}{16}$ " Dia. Hex Backing

$\frac{5}{16}$ " Dia. A.S.H. Hex Nut

$< 1\frac{3}{4}" \times 1\frac{1}{4}"$

Nut or approved shoulder must equal tearing area

DETAIL E
(Alternate Line Post)

HOOK BOLT

ANCHOR PLATE

ALTERNATE ANCHOR PLATE

FLANGED CHANNEL STEEL POST FOR 3 CABLE GUARDRAIL

GENERAL NOTES:

END POST CAP

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

Bolt will be in conformance with ASTM A563, Grade DH. Bolt will be galvanized in accordance with ASTM F2329.

Finish for the post and anchor plate will be a baked on high quality dark green enamel. Alternate anchor plate may be unfinished.

September 14, 2018

PLATE NUMBER
629.01

Sheet 6 of 6

Published Date: 2nd Qtr. 2019

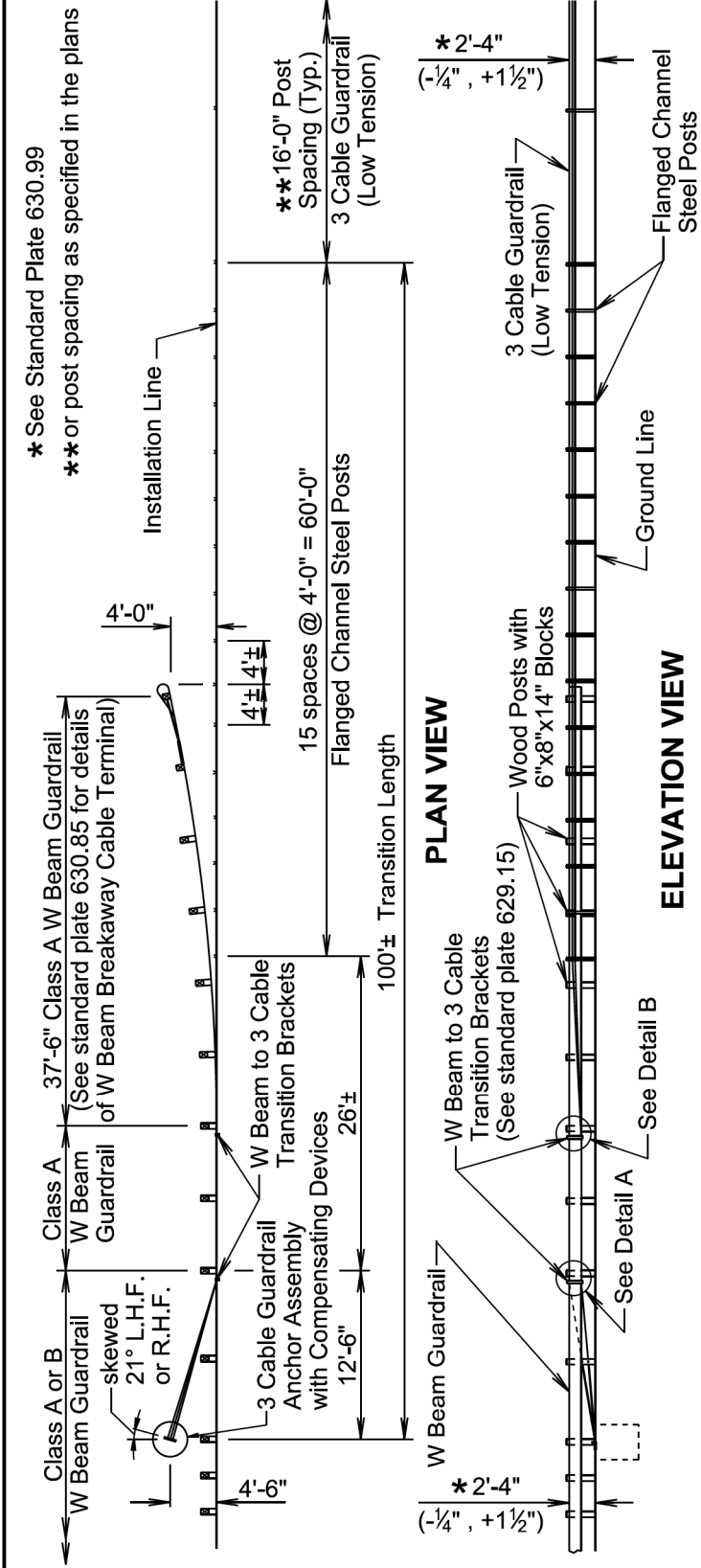
SD
DOT

W BEAM TO 3 CABLE TRANSITION

September 14, 2018

PLATE NUMBER
629.05

Sheet 1 of 1



GENERAL NOTES:

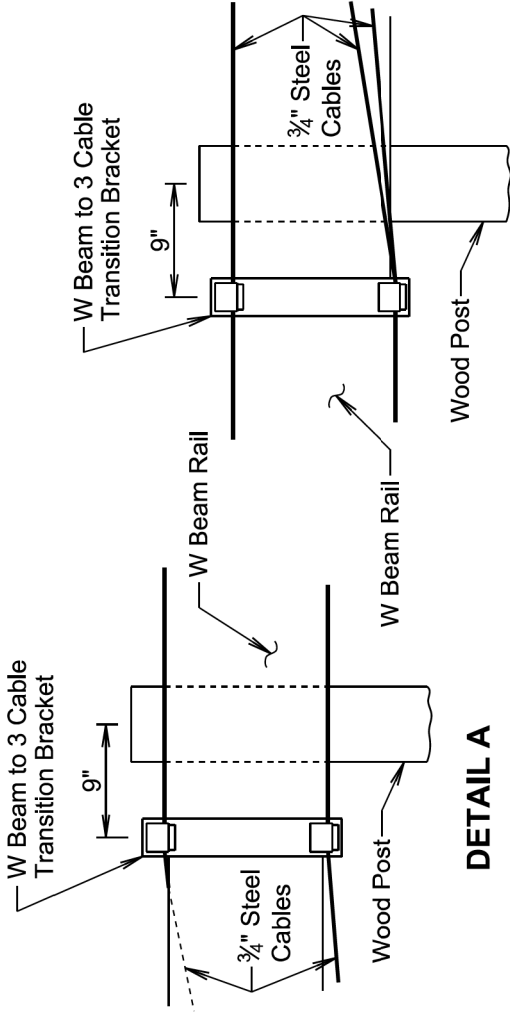
Flanged channel steel posts are shown on this standard plate, however, S3x5.7 steel I beam posts may be substituted for the flanged channel steel posts.

All costs associated with furnishing and installing the W Beam to 3 Cable Transition Bracket will be incidental to the contract unit price per foot for "3 Cable Guardrail", "Reset 3 Cable Guardrail", or "Reset 3 Cable Guardrail, Cable Only".

See standard plate 630.10 for details of W Beam Guardrail.

See standard plate 629.01 for details and payment information for 3 Cable Guardrail.

ELEVATION VIEW



DETAIL A

DETAIL B

* See Standard Plate 630.99

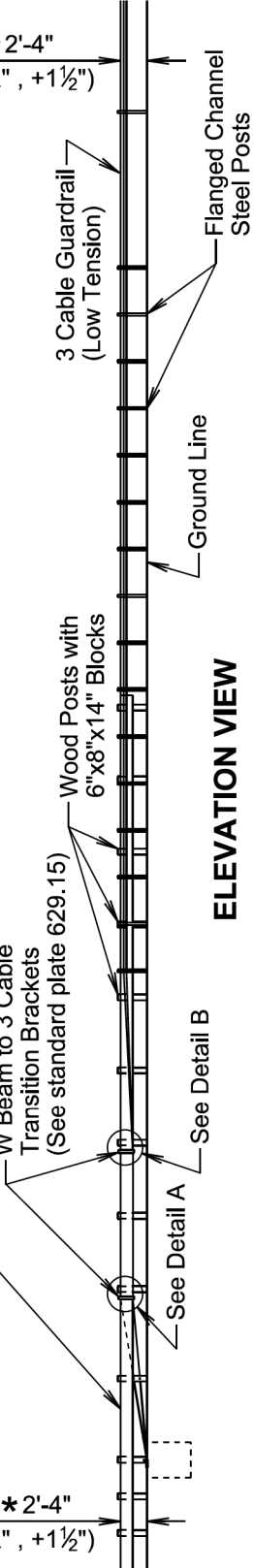
** or post spacing as specified in the plans

Installation Line

**16'-0" Post Spacing (Typ.)

3 Cable Guardrail (Low Tension)

PLAN VIEW



W Beam to 3 Cable Transition Bracket

W Beam Rail

Wood Post

3/4" Steel Cables

9"

W Beam to 3 Cable Transition Bracket

W Beam Rail

Wood Post

3/4" Steel Cables

9"

W Beam to 3 Cable Transition Bracket

W Beam Rail

Wood Post

3/4" Steel Cables

9"

W Beam to 3 Cable Transition Bracket

W Beam Rail

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3/4" Steel Cables

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W Beam to 3 Cable Transition Bracket

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3/4" Steel Cables

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W Beam to 3 Cable Transition Bracket

W Beam Rail

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W Beam to 3 Cable Transition Bracket

W Beam Rail

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3/4" Steel Cables

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W Beam to 3 Cable Transition Bracket

W Beam Rail

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3/4" Steel Cables

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W Beam to 3 Cable Transition Bracket

W Beam Rail

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

September 14, 2018

Sheet 2 of 3



GENERAL NOTES:

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

$\frac{3}{4}$ " round wire cable will consist of three strands (7 wires per strand) and have a minimum tensile strength of 25,000 pounds.

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

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

September 14, 2018

Sheet 3 of 3

Published Date: 2nd Qtr. 2019

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3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

Published Date: 2nd Qtr. 2019

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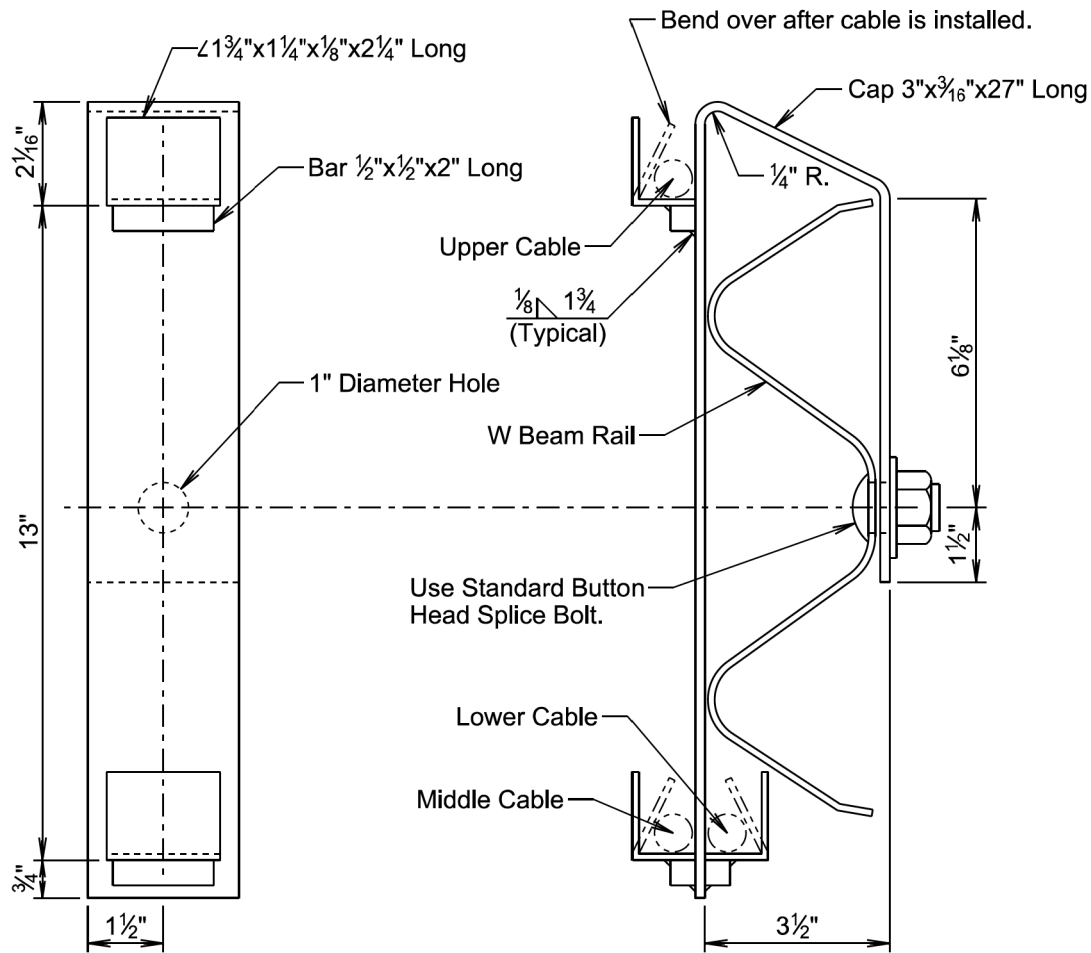
3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

PLATE NUMBER
629.10

Sheet 3 of 3

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	17	36

Plotting Date: 05/05/2019

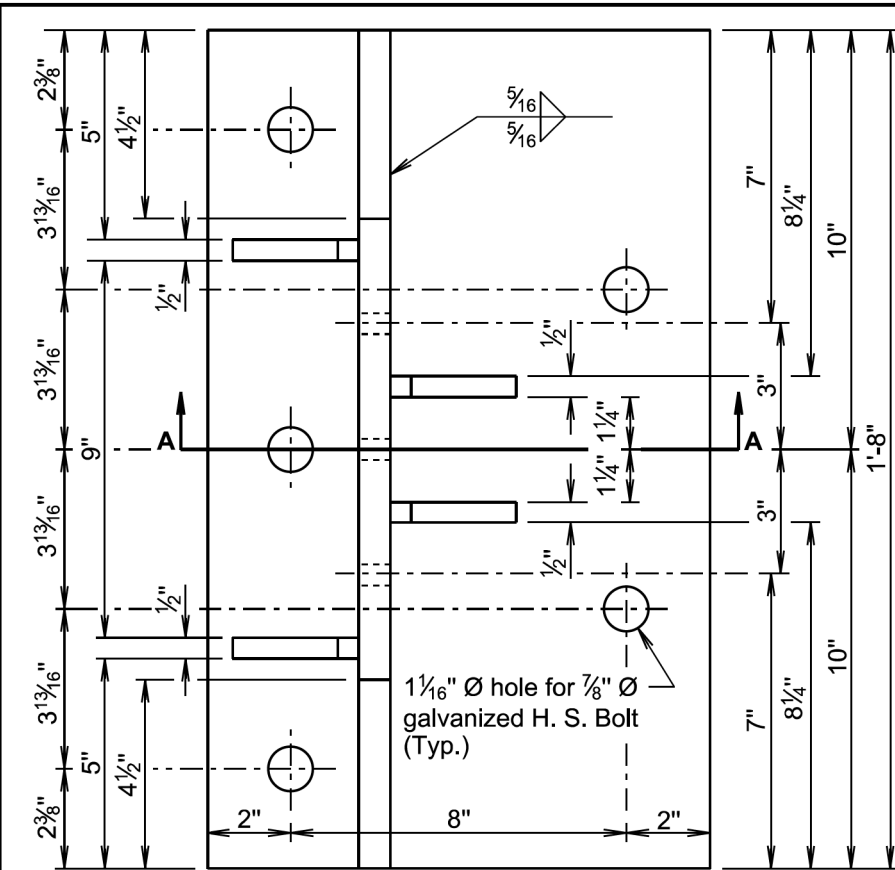


GENERAL NOTES:

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

September 14, 2018

Published Date: 2nd Qtr. 2019	S D D O T	W BEAM TO 3 CABLE TRANSITION BRACKET	PLATE NUMBER
			629.15
			Sheet 1 of 1



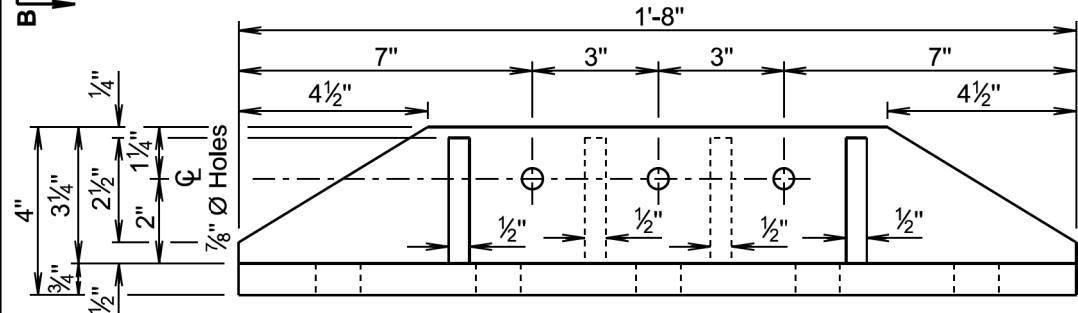
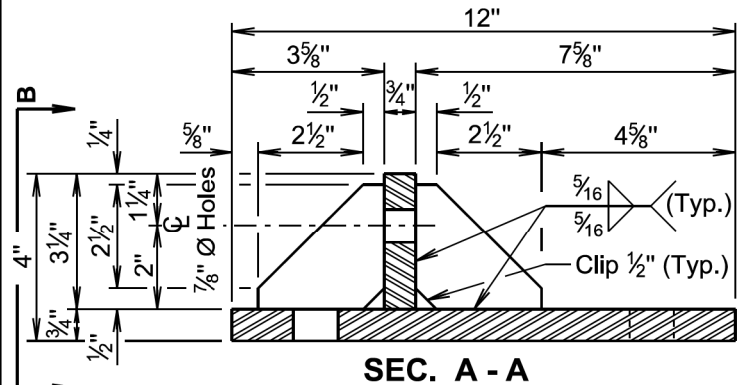
GENERAL NOTES:

All steel will conform to ASTM A709, Grade 36.
Welding and weld inspection will be in conformance with AWS/ANSI D1.1 (Current Year) Structural Welding Code - Steel.

After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).

Bolts, nuts, and washers will be provided with each assembly. Bolts will be galvanized and conform to the requirements of ASTM A307 or A449. Plain washers will be galvanized and conform to ASTM F844.

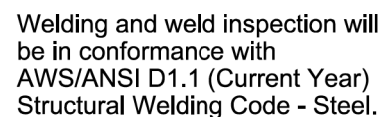
All Costs associated with furnishing and installing the 3 cable guardrail connection assembly will be incidental to the contract unit price for the bid items "Class A45 Concrete, Bridge Deck", "Class A45 Concrete, Bridge Repair", or "3 Cable Guardrail", as applicable.



September 14, 2018

Published Date: 2nd Qtr. 2019	S D D O T	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER
			629.30
			Sheet 1 of 1

Plotted From -



All Costs associated with furnishing and installing the 3 cable guardrail connection assembly will be incidental to the contract unit price for the bid items "Class A45 Concrete, Bridge Deck", "Class A45 Concrete, Bridge Repair", or "3 Cable Guardrail", as applicable.

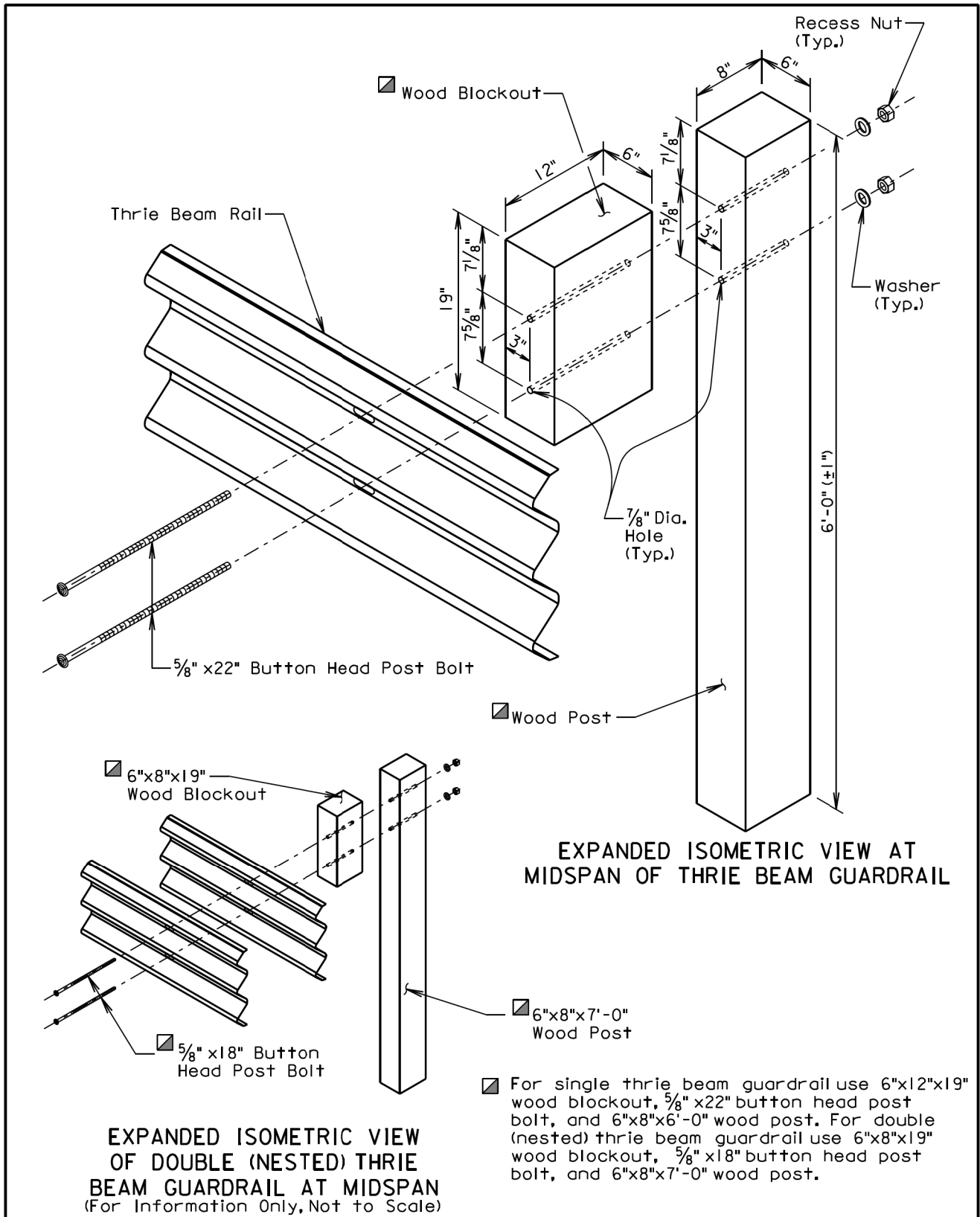


Sheet 1 of 1

3 CABLE GUARDRAIL CONNECTION ASSEMBLY

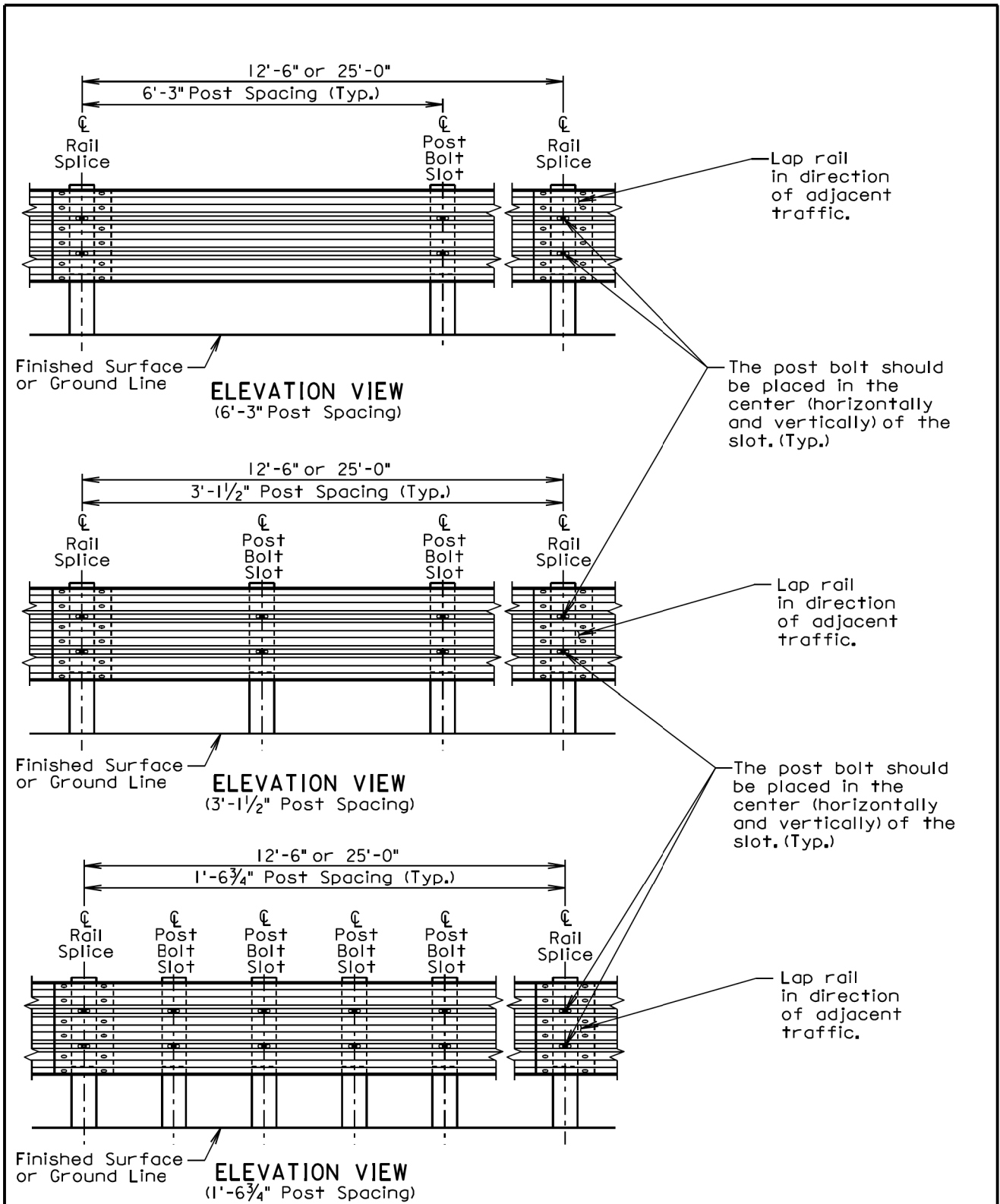


Sheet 1 of 5



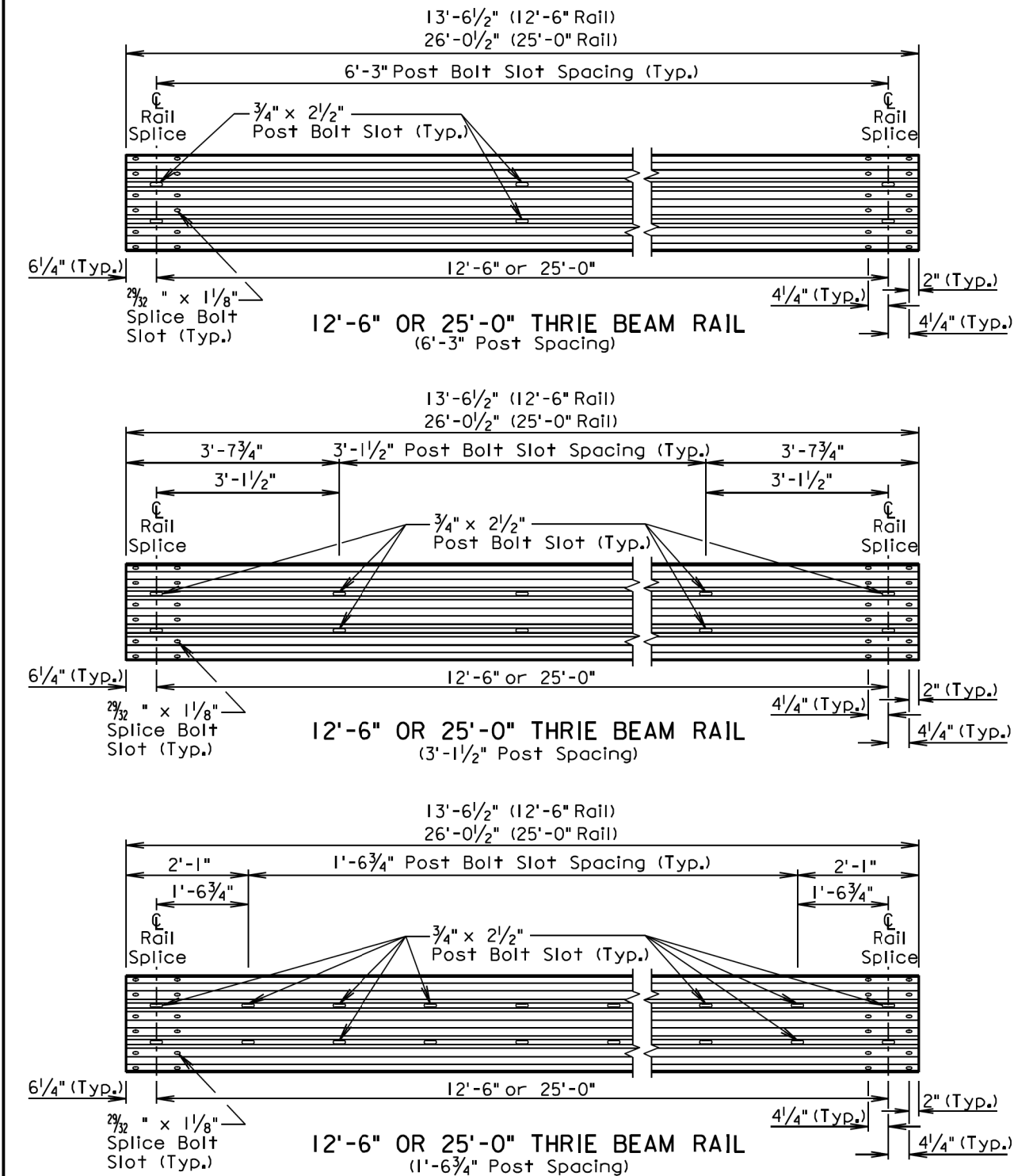
May 1, 2018

Published Date: 2nd Qtr. 2019	S D D O T	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 2 of 5



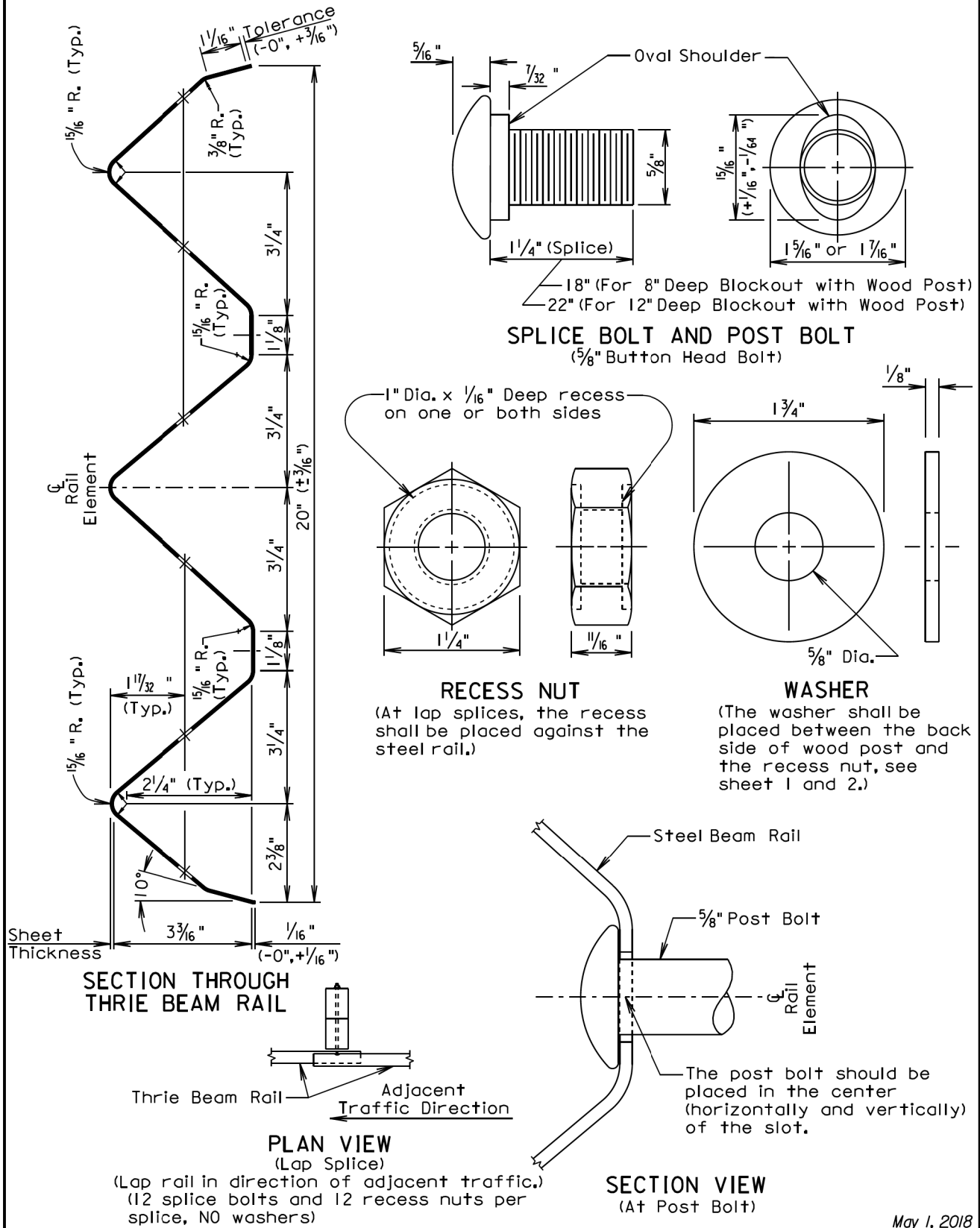
May 1, 2018

Published Date: 2nd Qtr. 2019	S D D O T	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 3 of 5



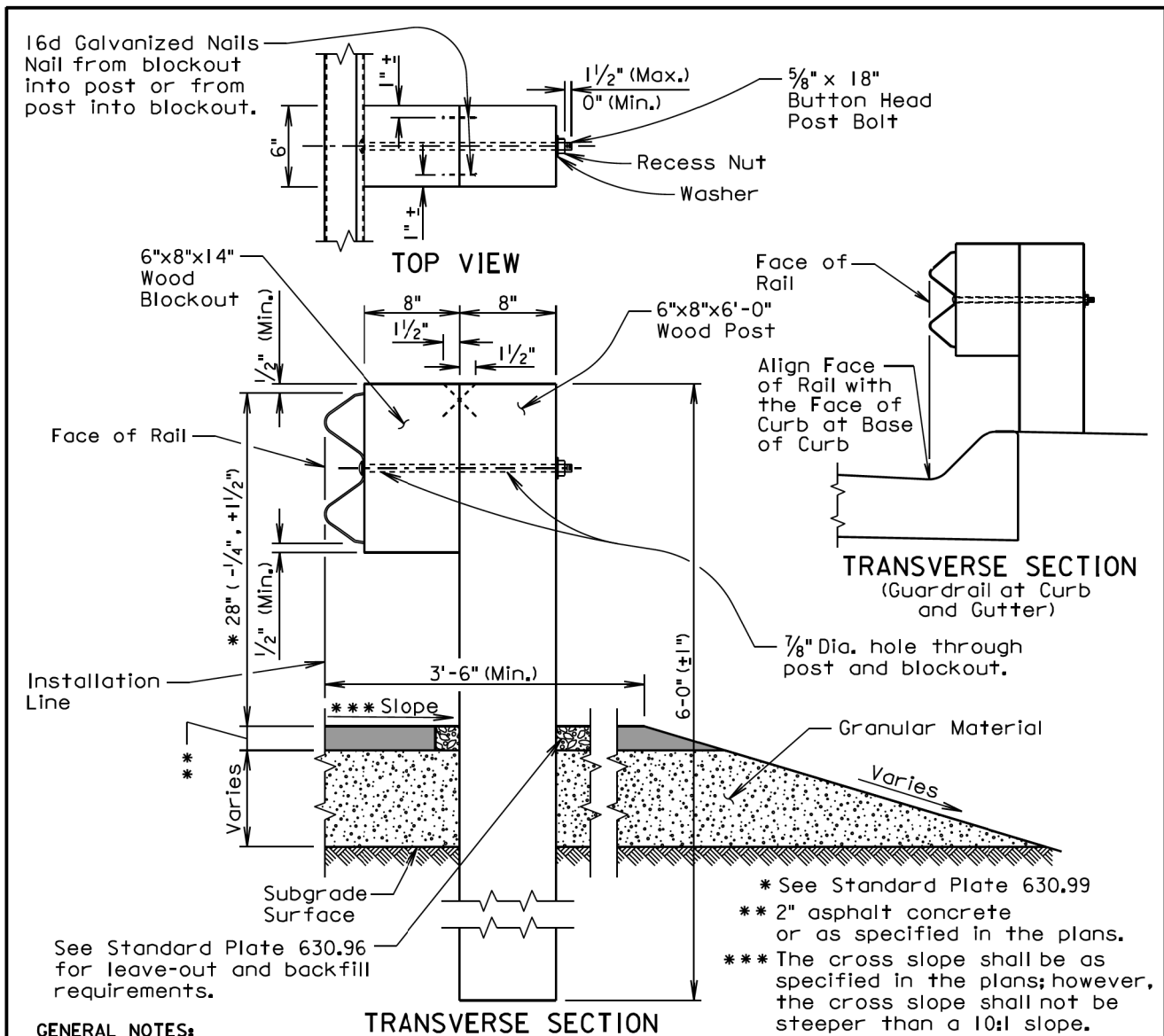
May 1, 2018

Published Date: 2nd Qtr. 2019	S D D O T	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 4 of 5



May 1, 2018

Published Date: 2nd Qtr. 2019	S D D O T	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 5 of 5



GENERAL NOTES:

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

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

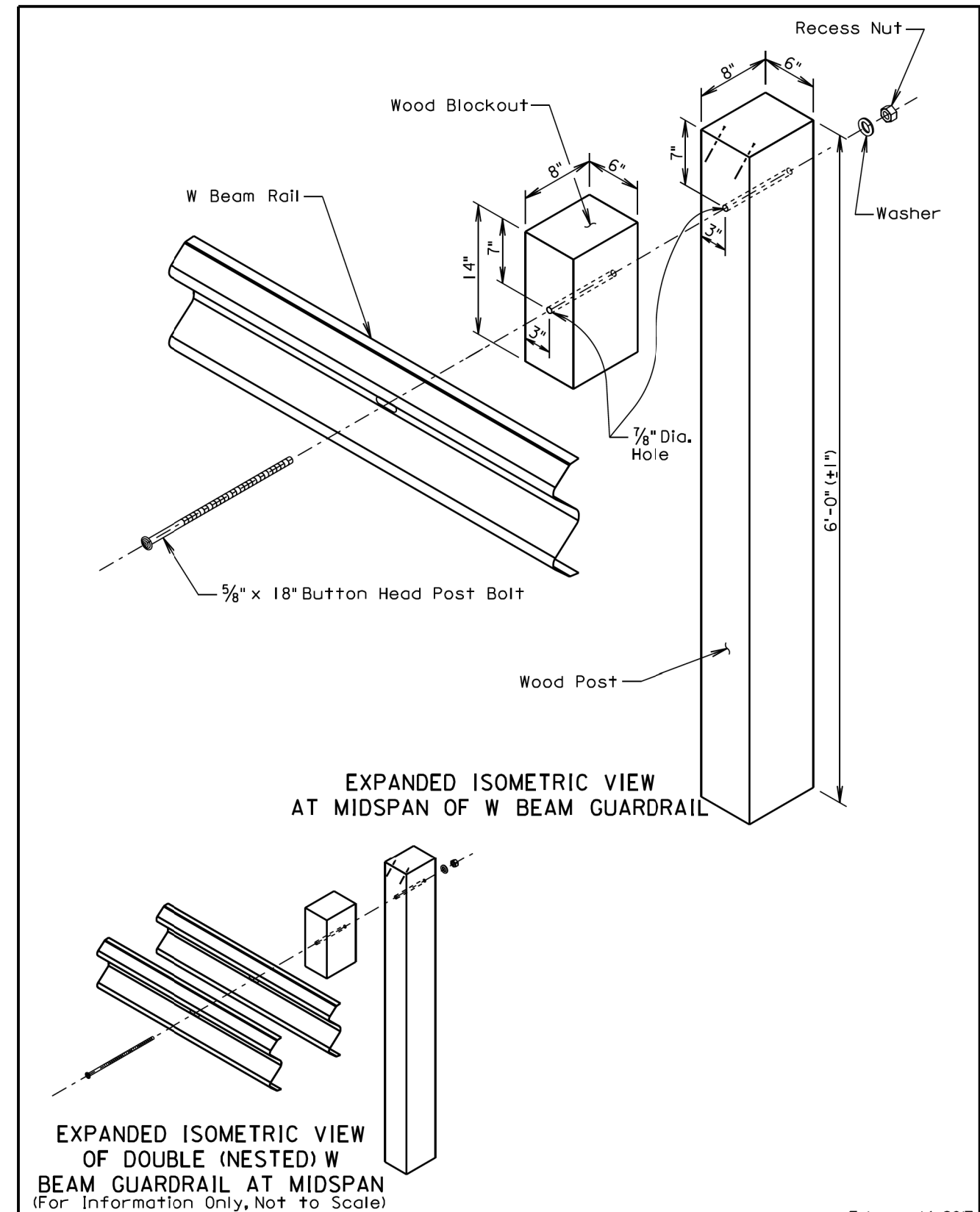
All W beam rail shall be Type I and Class A (12 Ga.) unless specified otherwise in the plans. W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

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

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

February 14, 2017

Published Date: 2nd Qtr. 2019	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER
			630.10
			Sheet 1 of 5



February 14, 2017

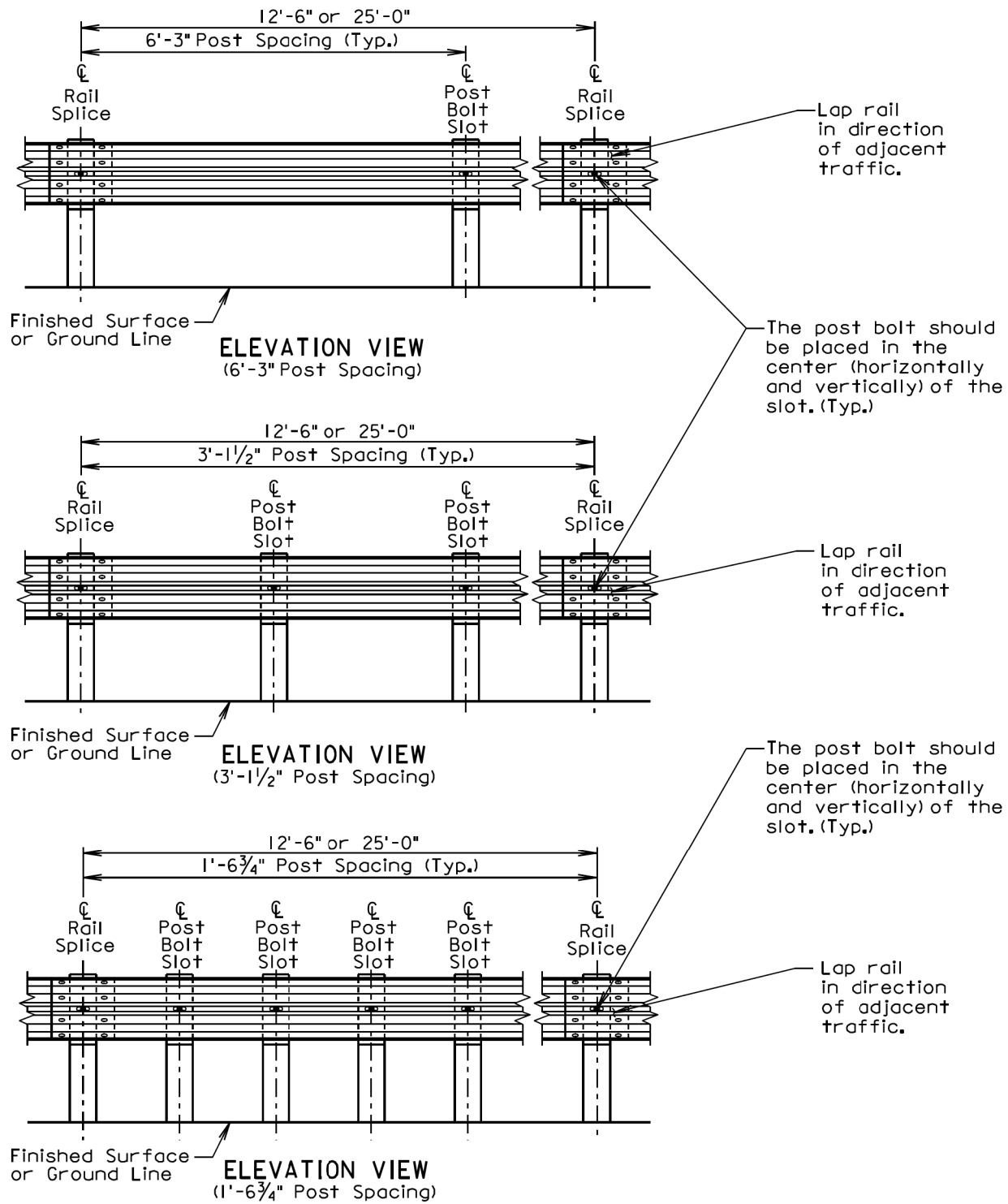
Published Date: 2nd Qtr. 2019	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER
			630.10
			Sheet 2 of 5

Plot Scale - 1:200

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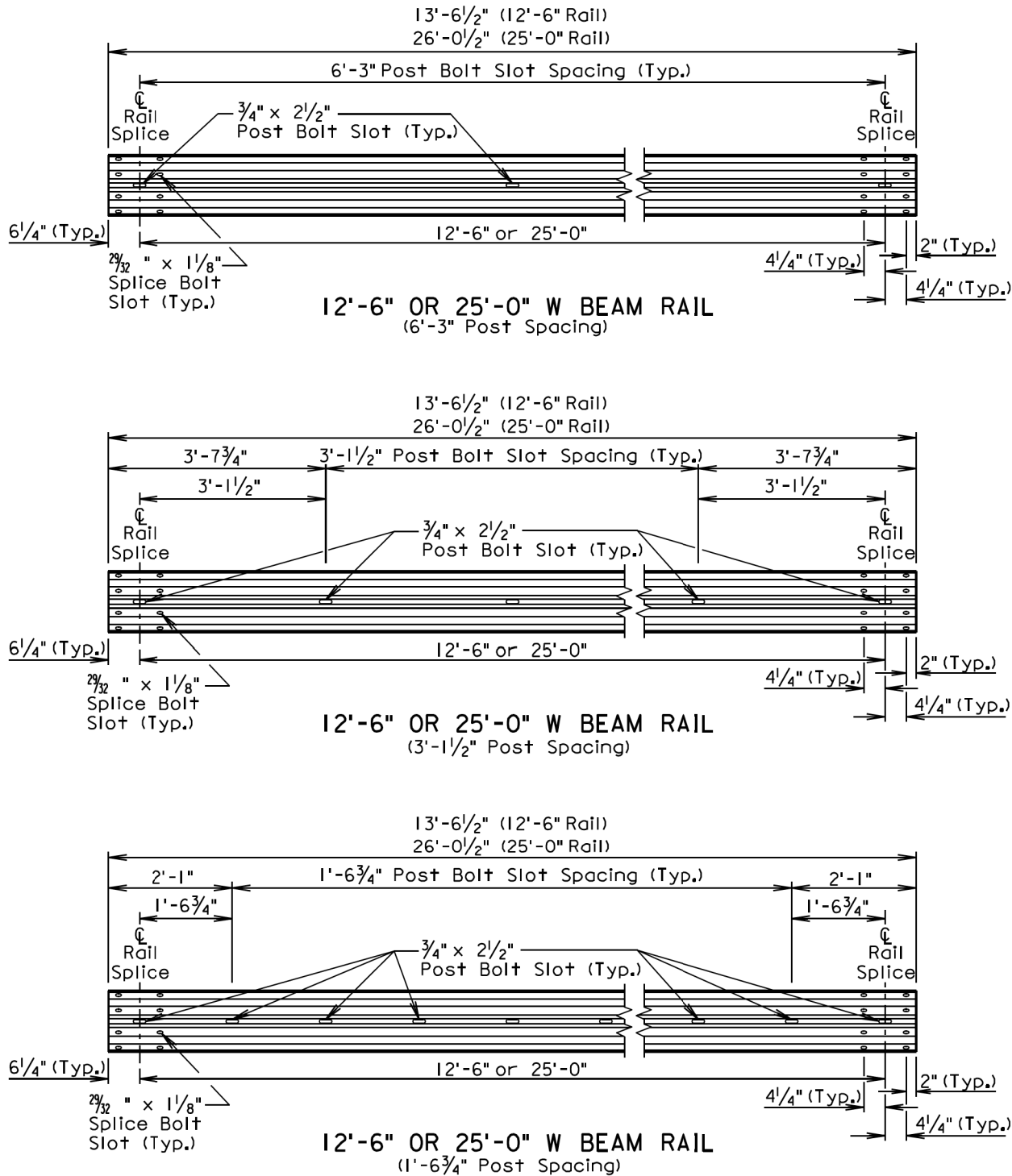
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	22	36

Plotting Date: 05/05/2019



February 14, 2017

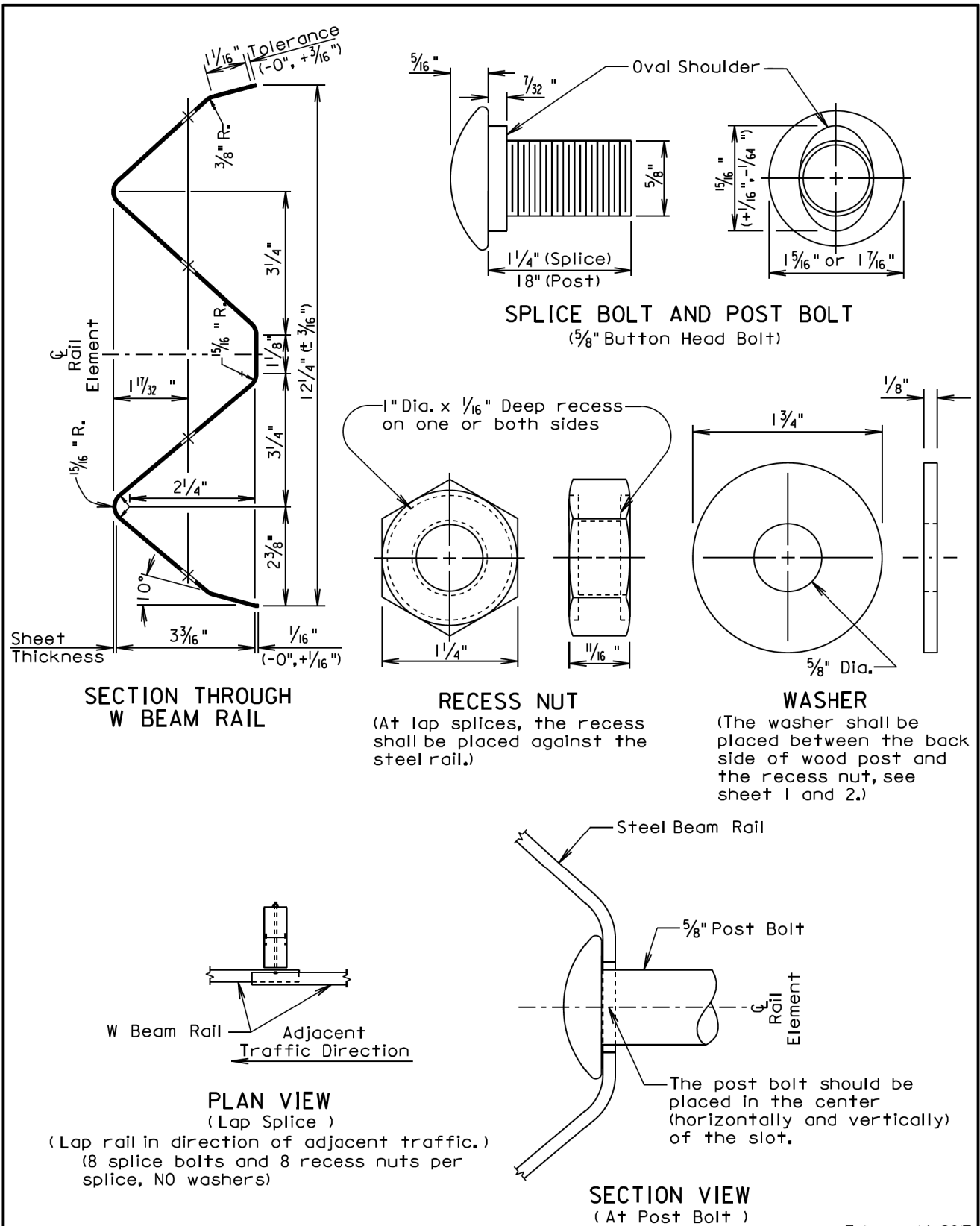
Published Date: 2nd Qtr. 2019	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER
			630.10
			Sheet 3 of 5



February 14, 2017

Published Date: 2nd Qtr. 2019	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER
			630.10
			Sheet 4 of 5

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

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

GENERAL NOTES:

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

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

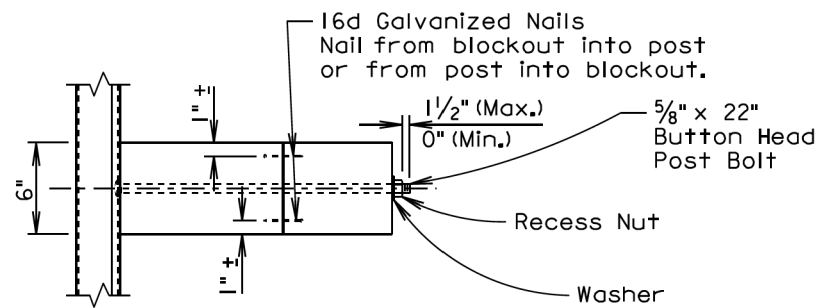
Topsoil is not shown in the transverse section drawing on sheet 2 of 6.

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

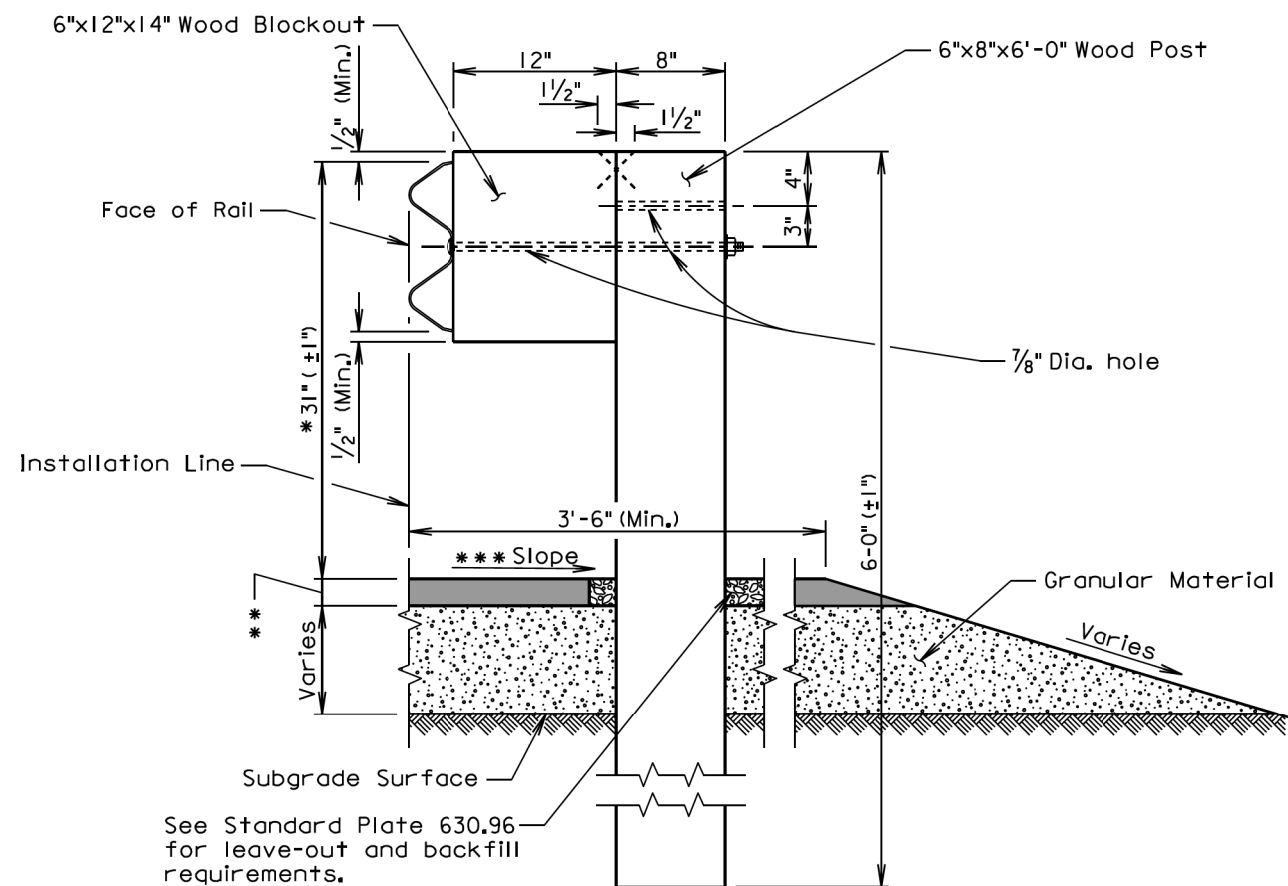
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

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

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



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



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

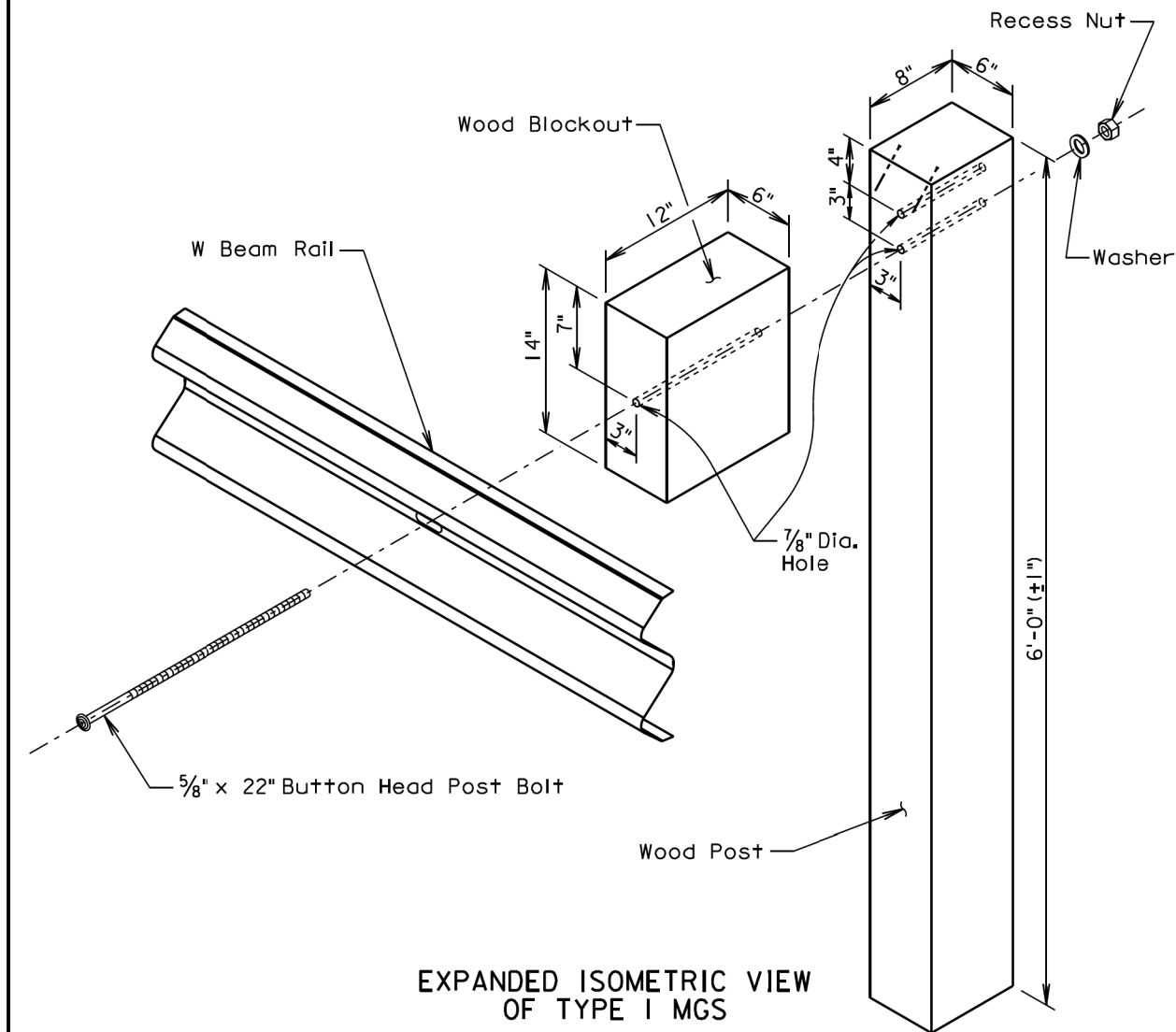
* See Standard Plate 630.99

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

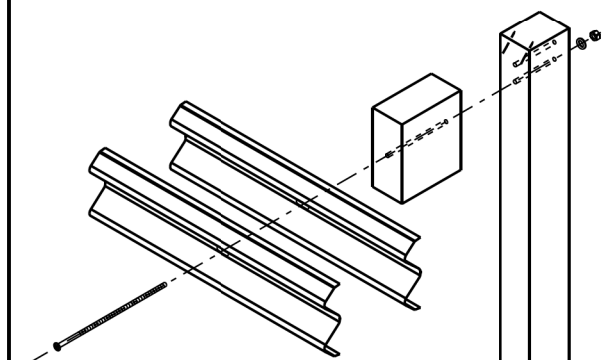
*** The cross slope shall be as specified in the plans; however, the cross slope shall not be steeper than a 10:1 slope.

September 14, 2017

Published Date: 2nd Qtr. 2019	S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6



**EXPANDED ISOMETRIC VIEW
OF TYPE 1 MGS**



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

September 14, 2017

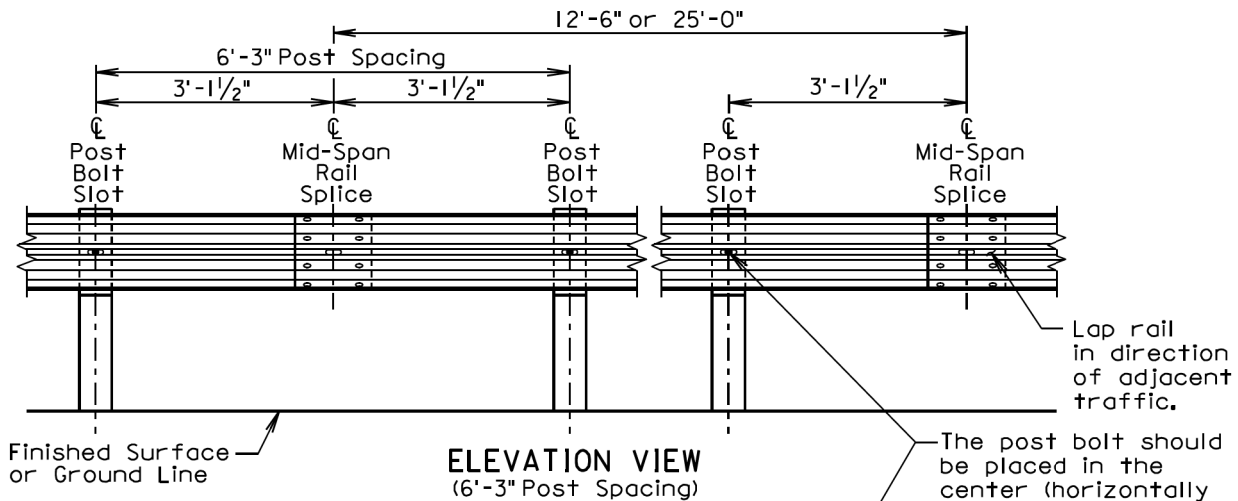
Published Date: 2nd Qtr. 2019	S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 3 of 6

Plot Scale - 1:200

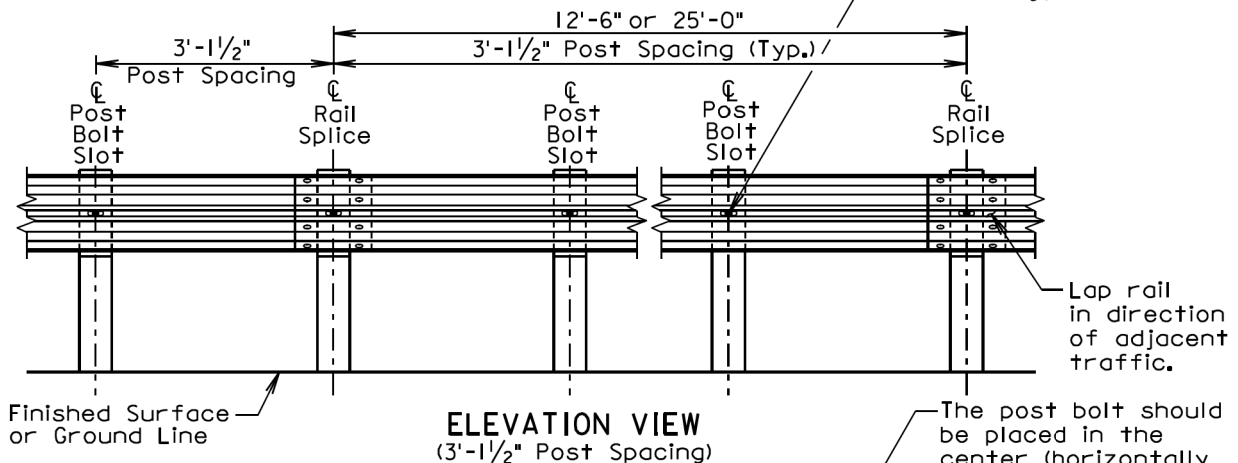
Plotted From - tw11mt19

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	25	36

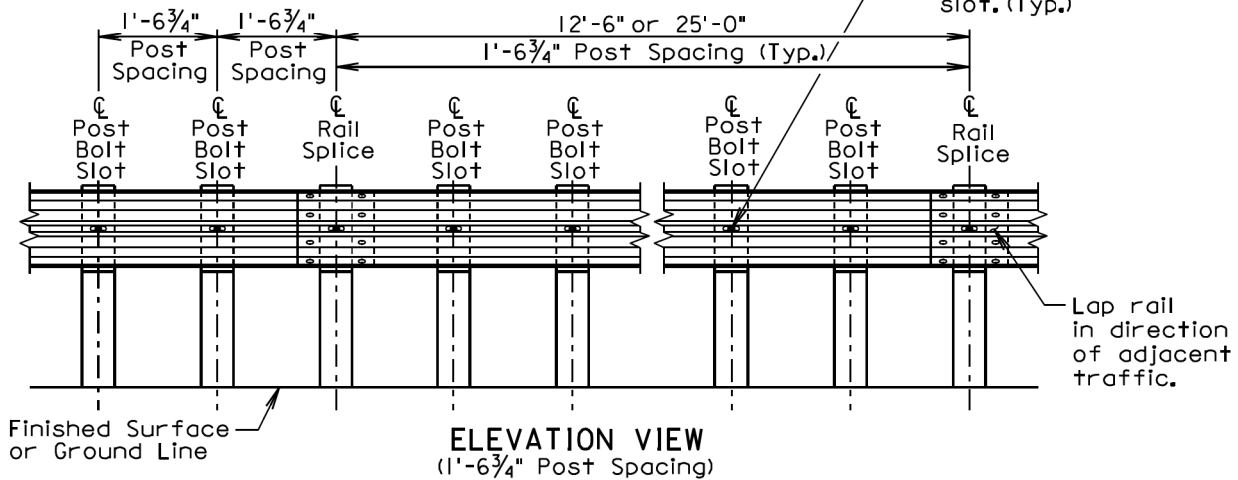
Plotting Date: 05/05/2019



ELEVATION VIEW
(6'-3" Post Spacing)



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



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

September 14, 2017

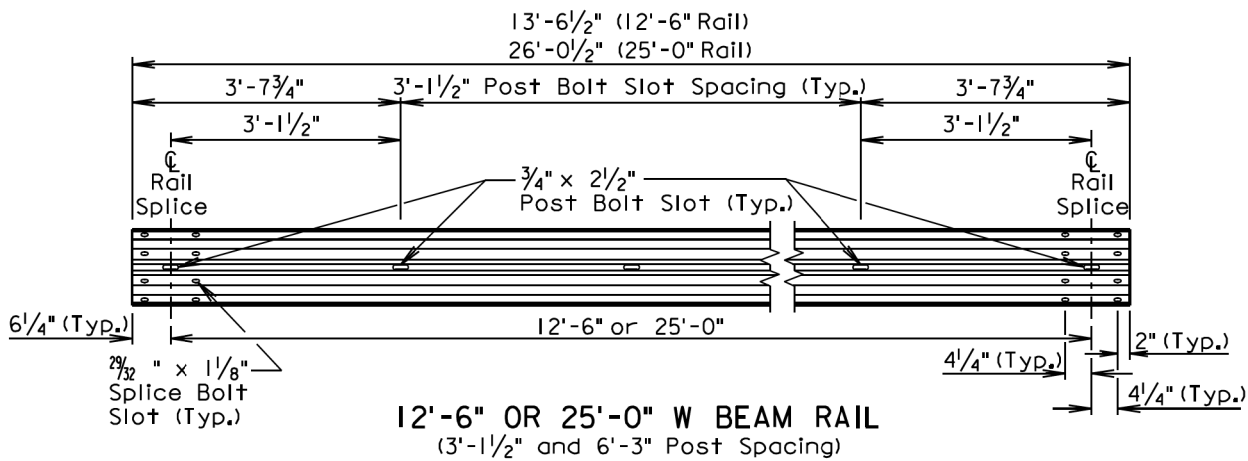
Published Date: 2nd Qtr. 2019

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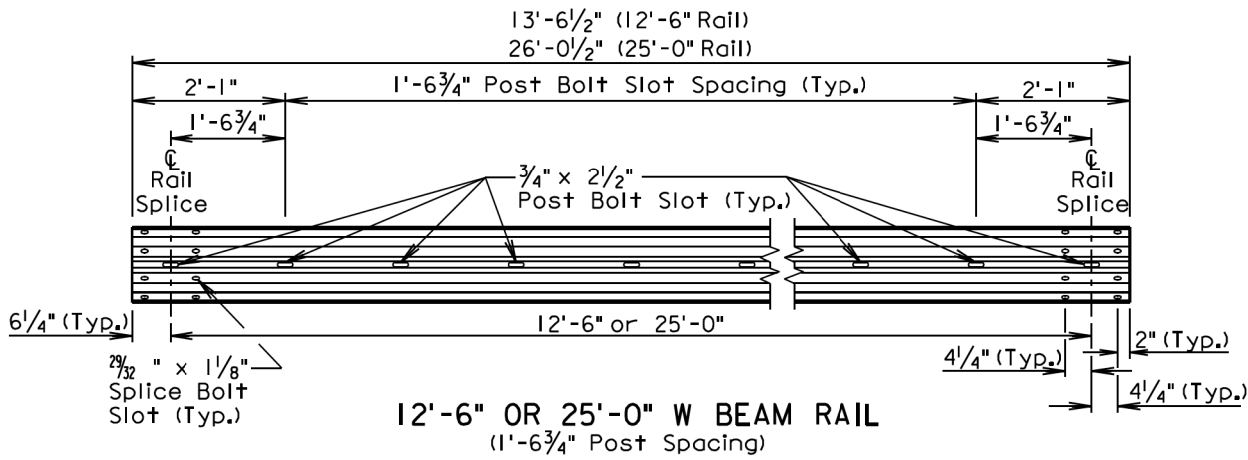
MIDWEST GUARDRAIL SYSTEM (MGS)

PLATE NUMBER
630.20

Sheet 4 of 6



12'-6" OR 25'-0" W BEAM RAIL
(3'-1 1/2" and 6'-3" Post Spacing)



12'-6" OR 25'-0" W BEAM RAIL
(1'-6 3/4" Post Spacing)

September 14, 2017

Published Date: 2nd Qtr. 2019

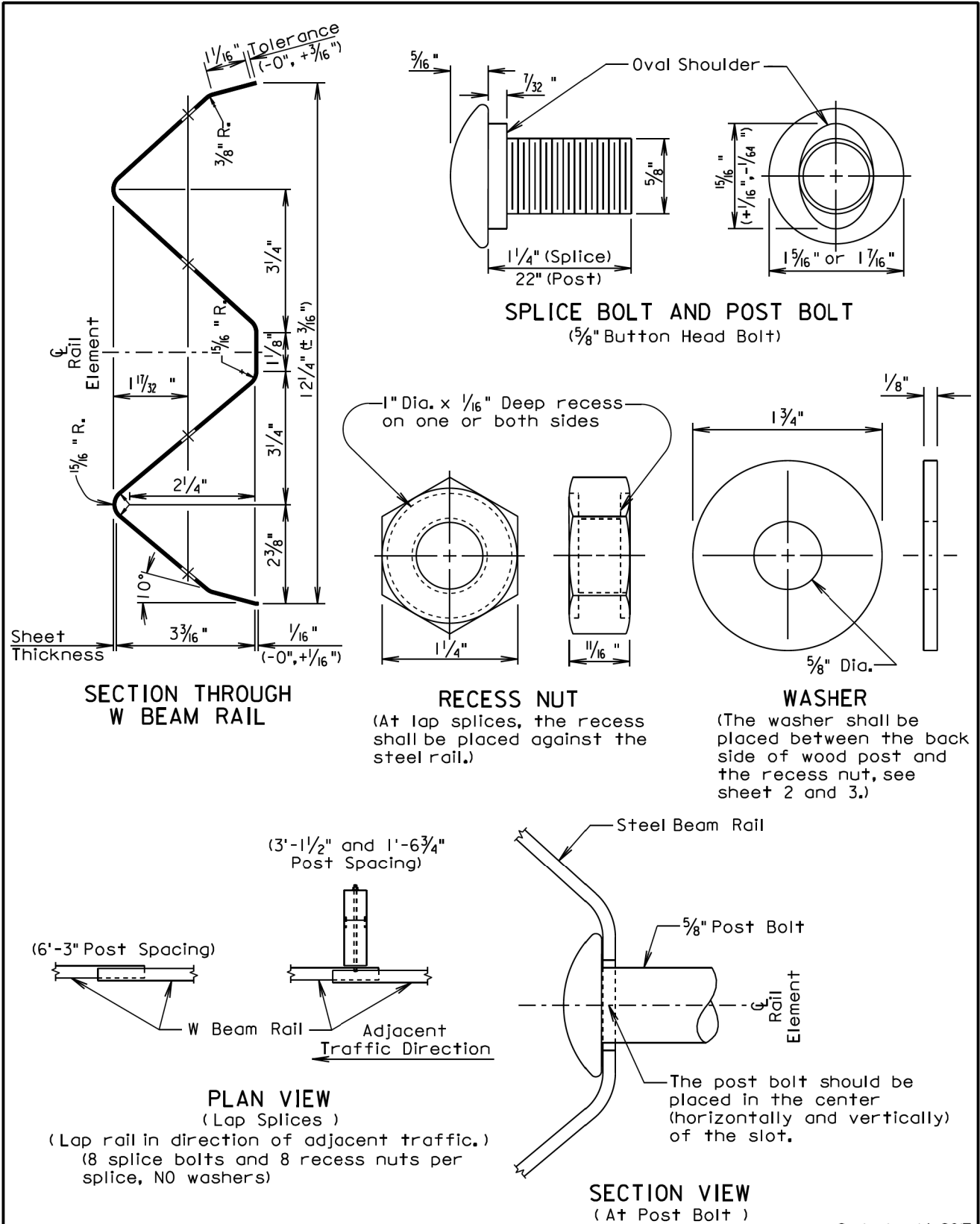
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MIDWEST GUARDRAIL SYSTEM (MGS)

PLATE NUMBER
630.20

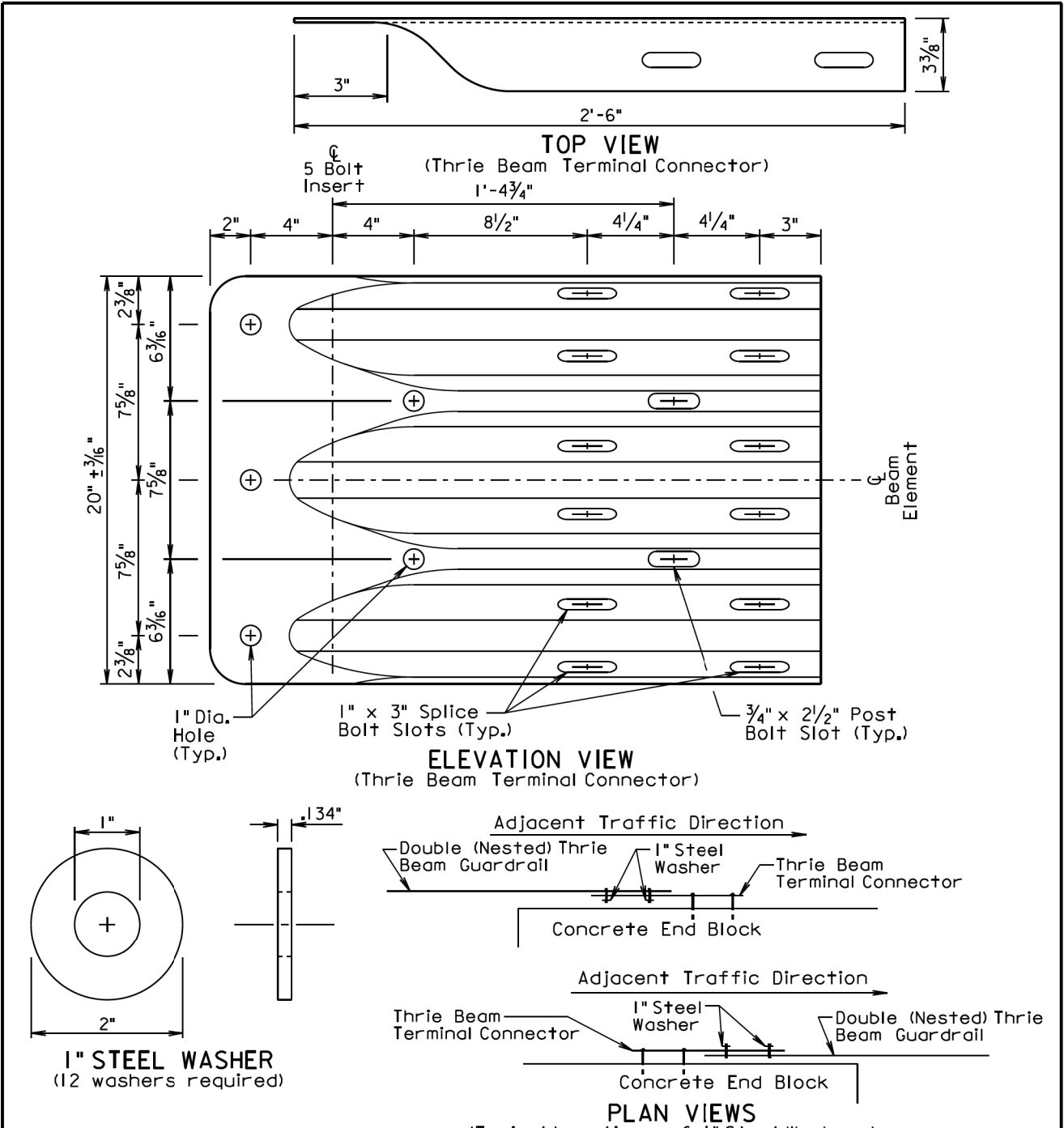
Sheet 5 of 6

File - ...15FQ ST Plates Template Set 1.dgn



September 14, 2017

Published Date: 2nd Qtr. 2019	S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER
			630.20
			Sheet 6 of 6



GENERAL NOTES:

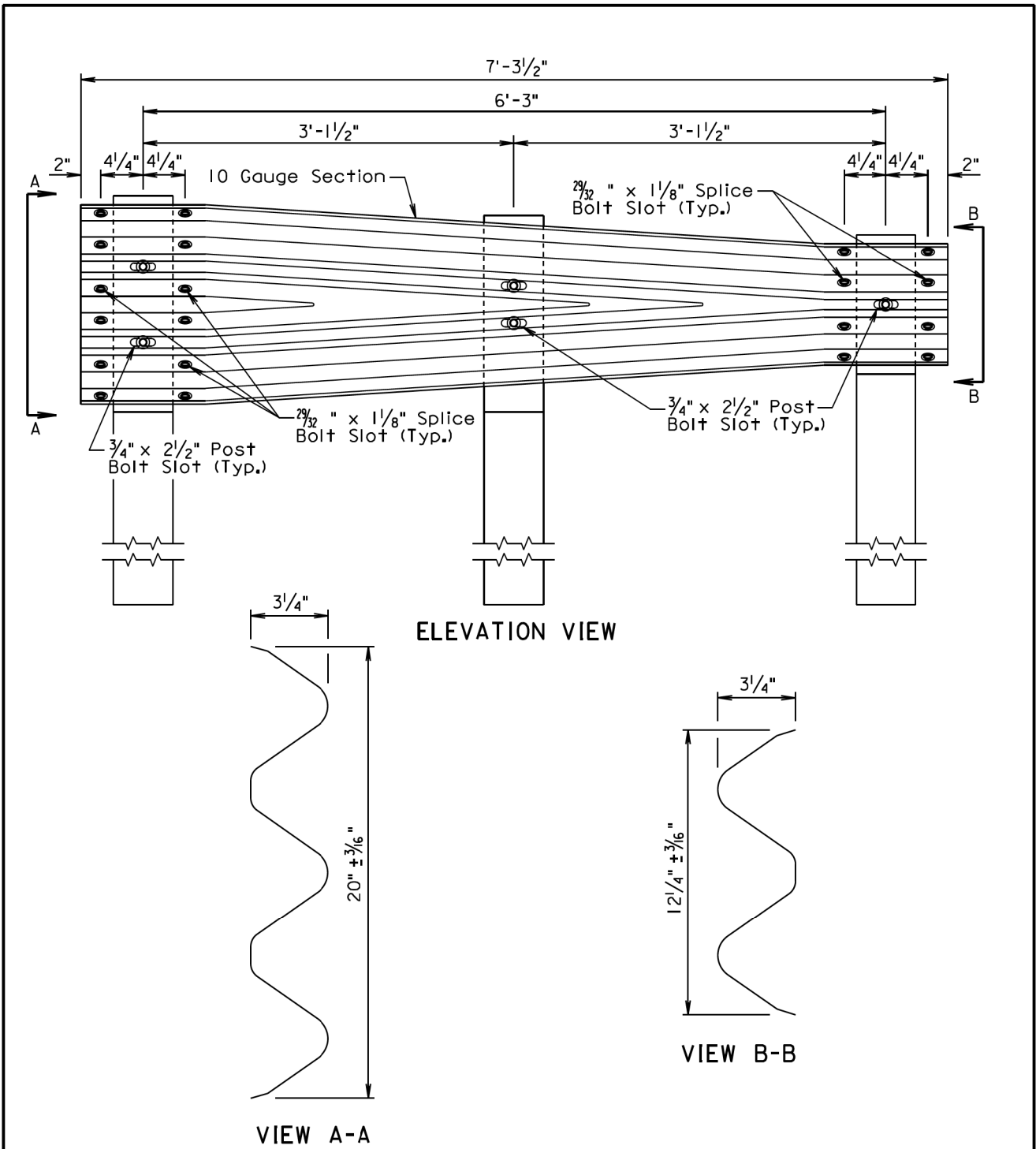
Thrie Beam Terminal Connectors shall be 10 gauge.

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

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

February 14, 2017

Published Date: 2nd Qtr. 2019	S D D O T	THRIE BEAM TERMINAL CONNECTOR	PLATE NUMBER
			630.47
			Sheet 1 of 1

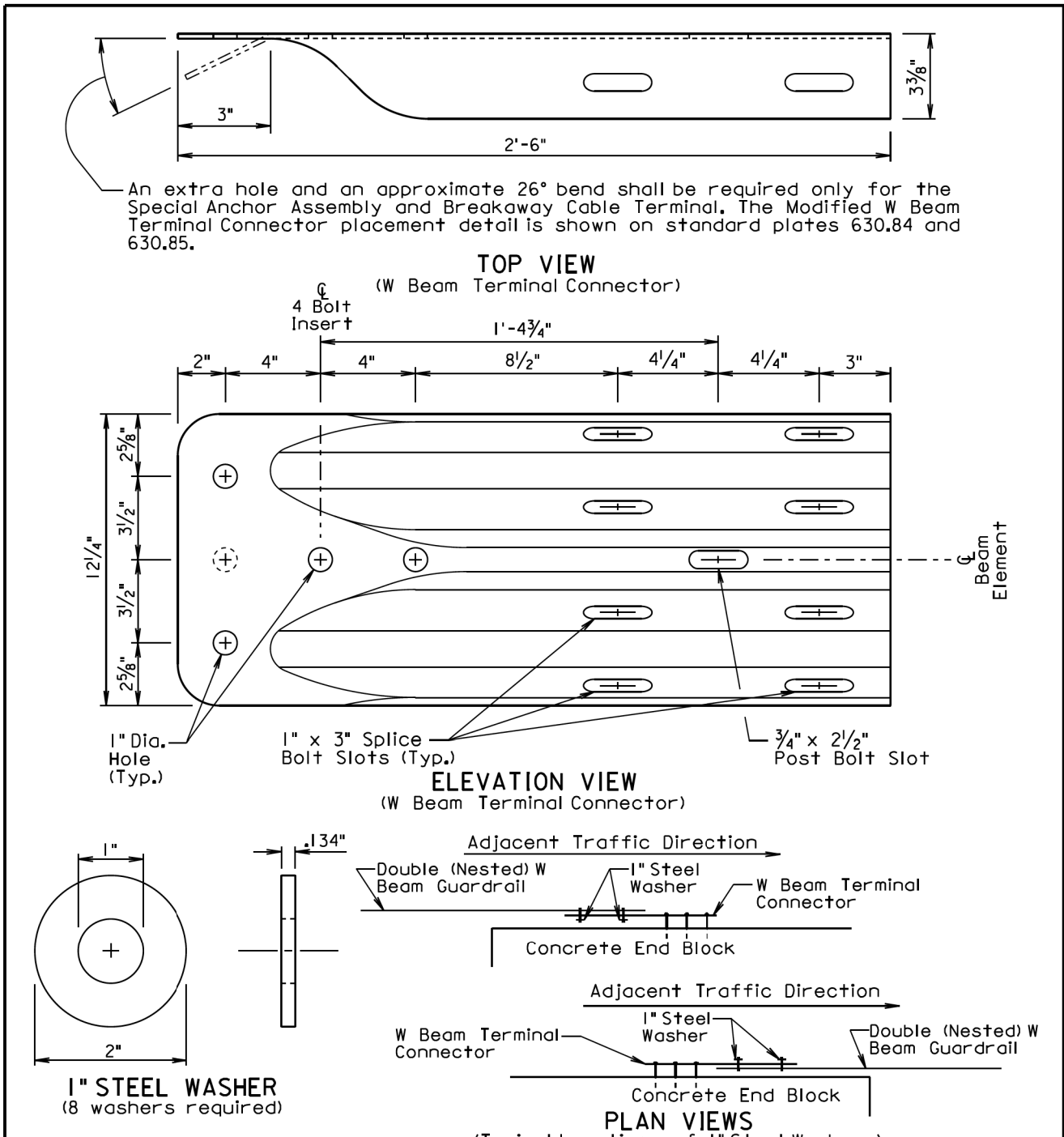


GENERAL NOTES:

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

February 14, 2017

Published Date: 2nd Qtr. 2019	S D D O T	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER
			630.48
			Sheet 1 of 1



GENERAL NOTES:

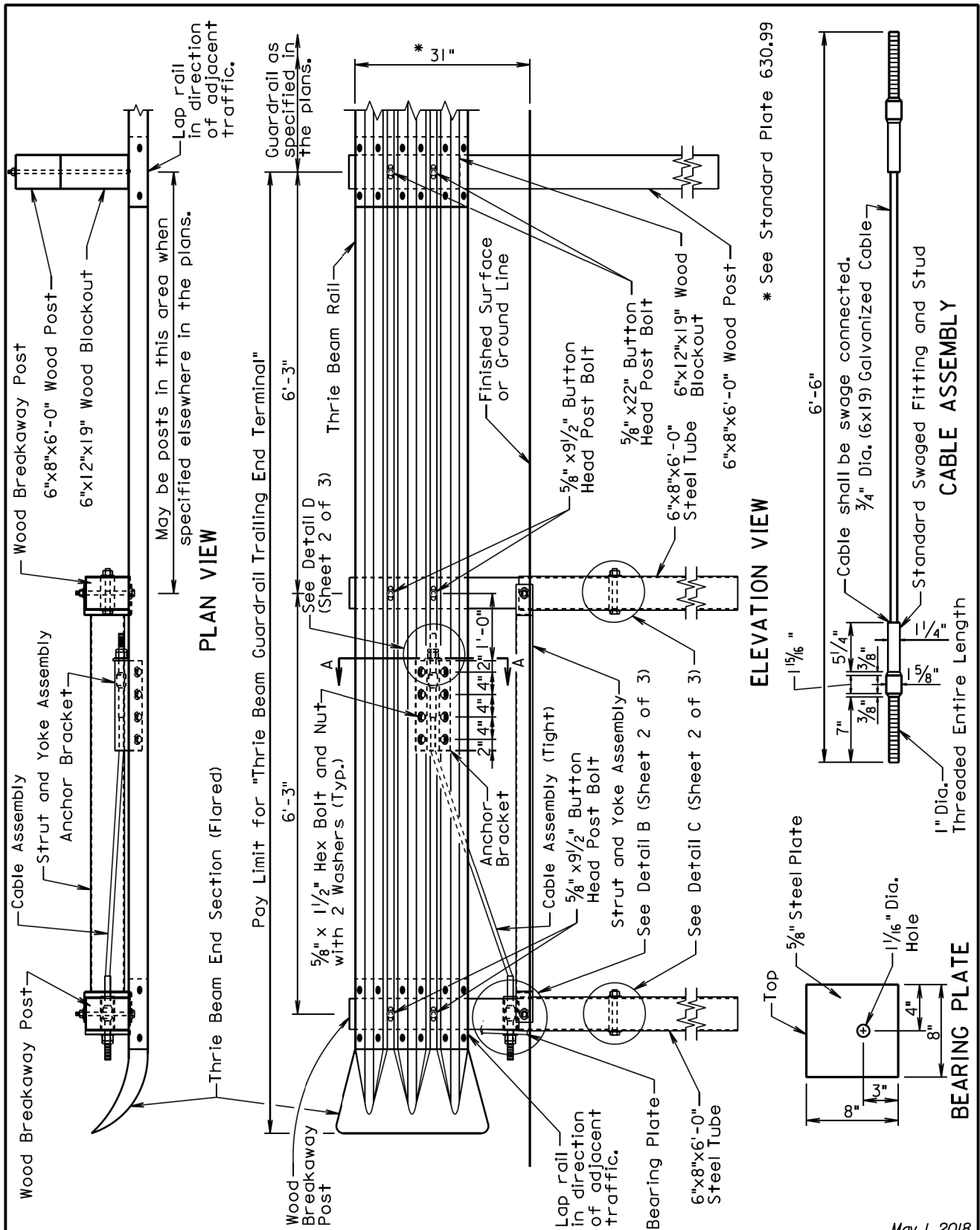
W Beam Terminal Connectors shall be 10 gauge.

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

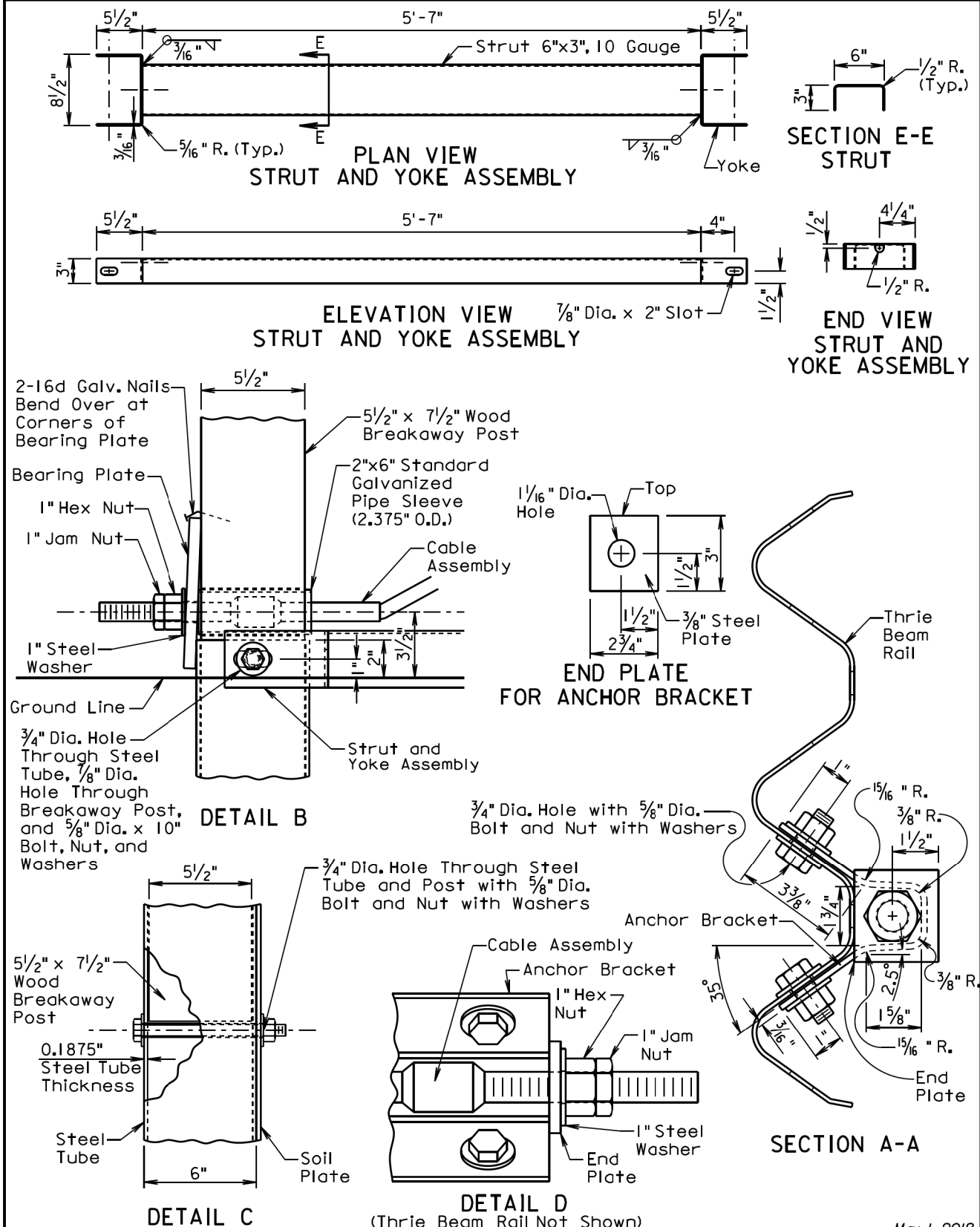
There will be no separate payment for furnishing and installing the W beam terminal connector. All costs for furnishing and installing the W beam terminal connector shall be incidental to the contract unit price of the respective guardrail item it is attached to.

February 14, 2017

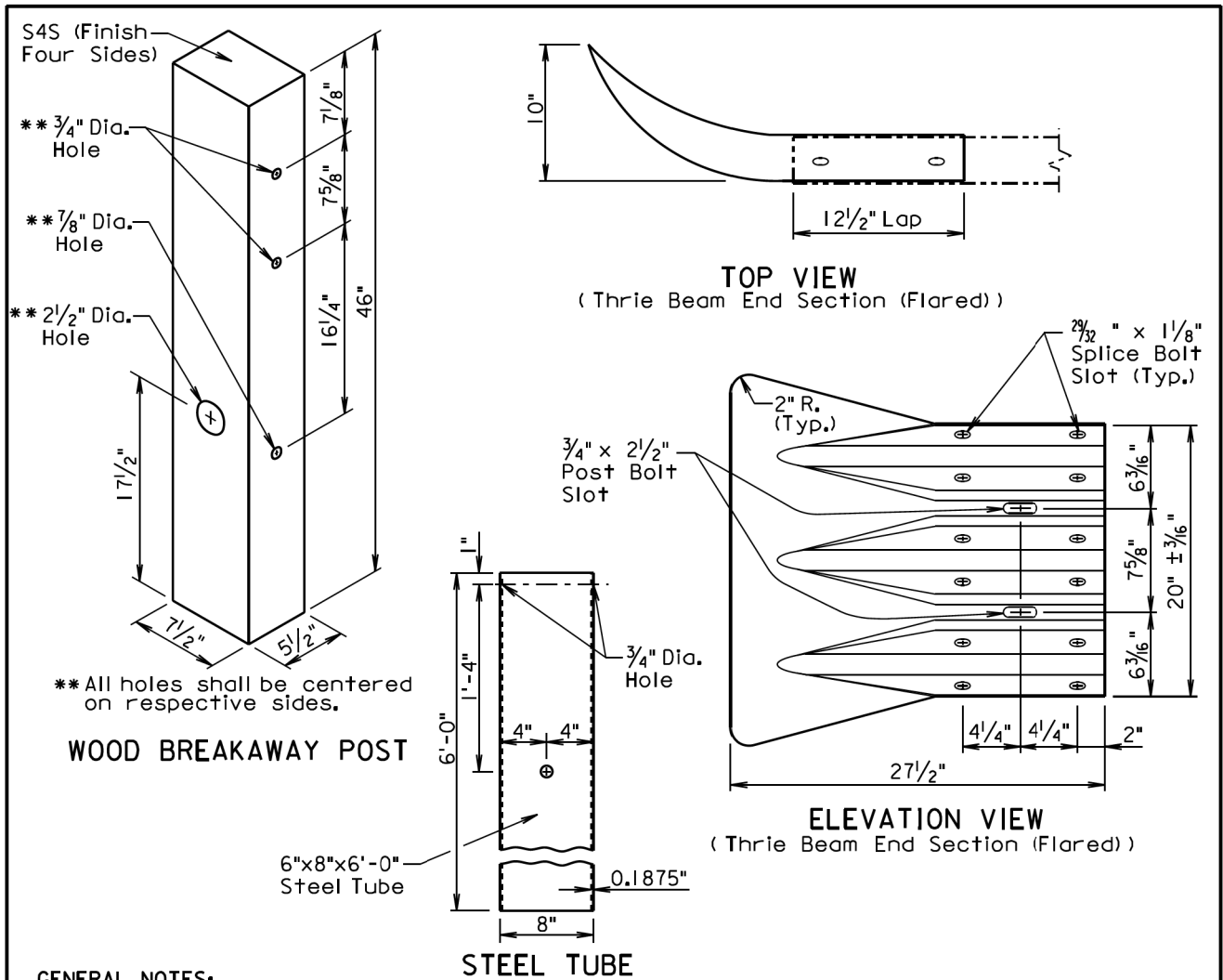
Published Date: 2nd Qtr. 2019	S D D O T	W BEAM TERMINAL CONNECTOR	PLATE NUMBER
			630.59
			Sheet 1 of 1



Published Date: 2nd Qtr. 2019	S D D O T	THRIE BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 1 of 3
			May 1, 2018



Published Date: 2nd Qtr. 2019	S D D O T	THRIE BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 2 of 3
			May 1, 2018



GENERAL NOTES:

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

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

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

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

All hardware shall be galvanized in accordance with ASTM A153.

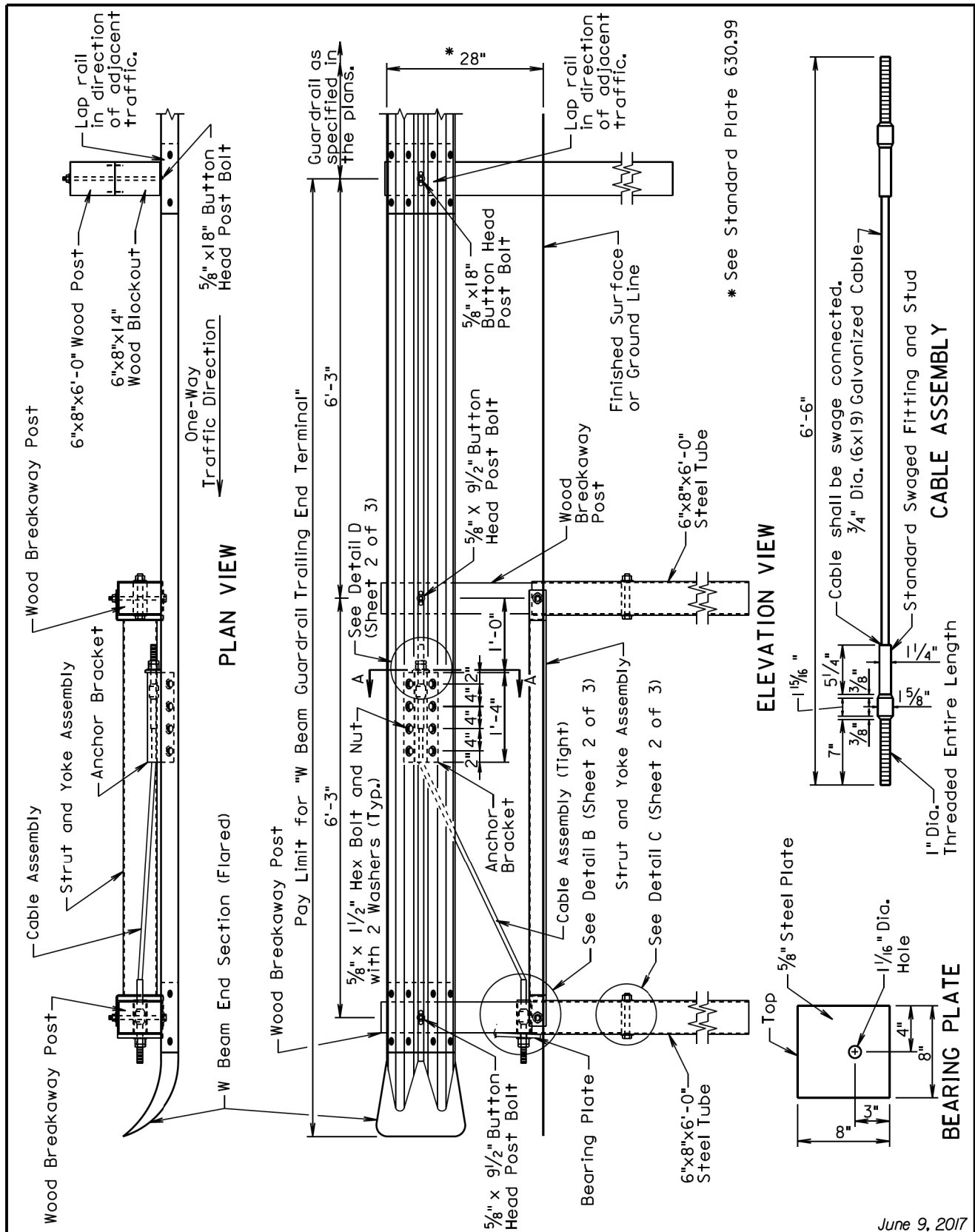
The anchor bracket, soil plate, and bearing plate shall be fabricated from steel that meets ASTM A36 Specifications. They shall be galvanized after fabrication in accordance with ASTM A123.

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

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

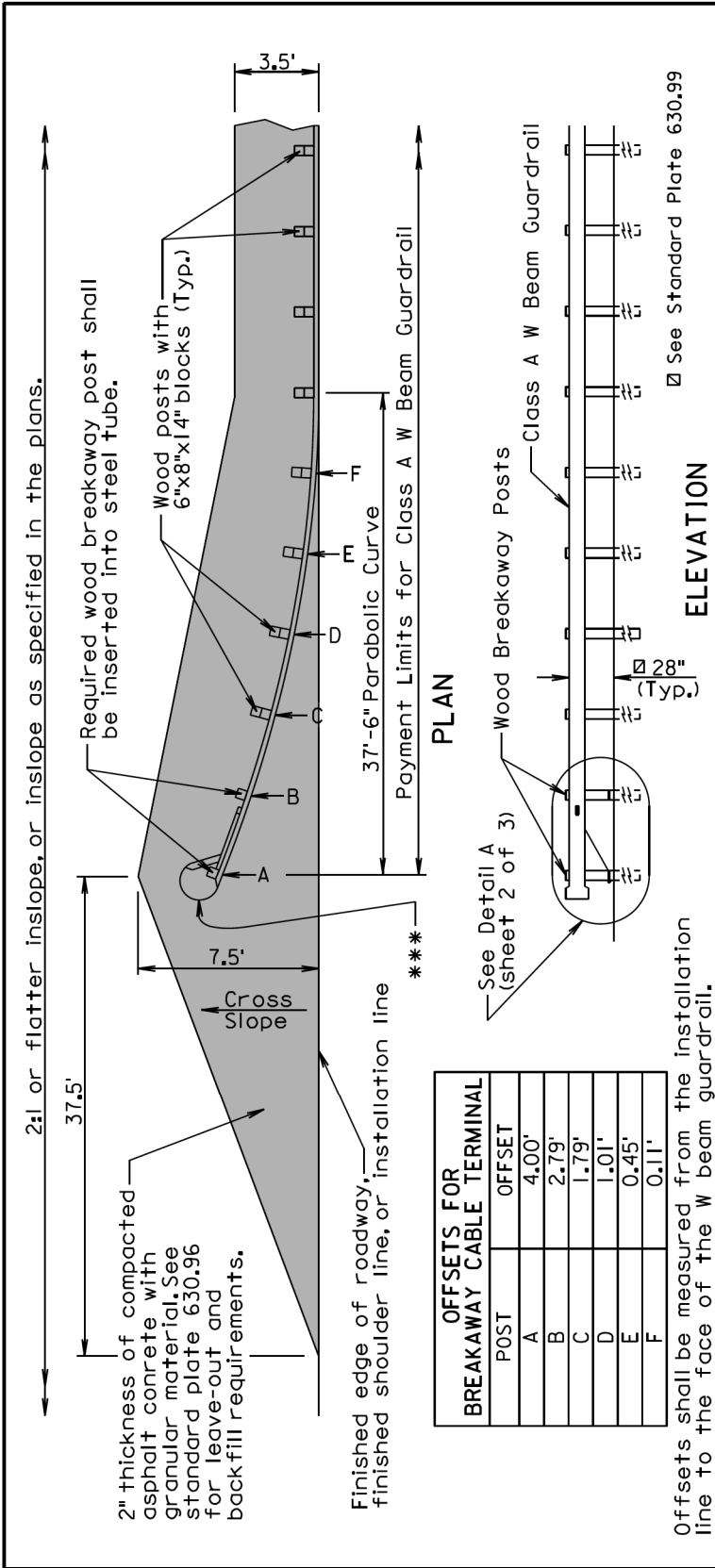
May 1, 2018

Published Date: 2nd Qtr. 2019	S D D O T	THRIE BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
		Sheet 3 of 3	



June 9, 2017

Published Date: 2nd Qtr. 2019	S D D O T	W BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.81
		Sheet 1 of 3	



See Standard Plate 630.99

Offsets shall be measured from the installation line to the face of the W beam guardrail.

GENERAL NOTES:

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

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

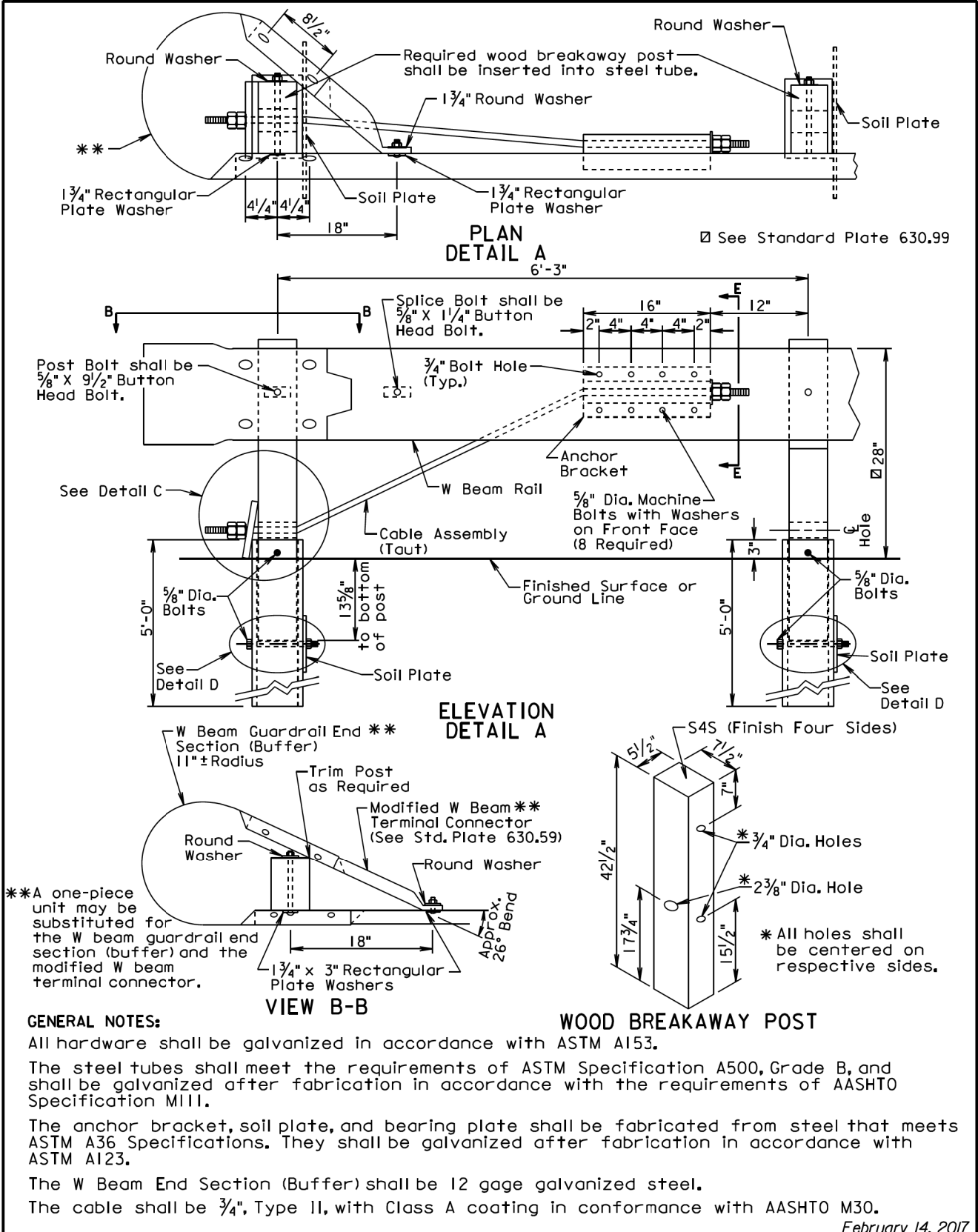
Granular material shall be the same type used elsewhere on the project or shall be as specified in the plans. If granular material type is not specified in the plans, the material shall conform to the Specifications for "Base Course". The granular material shall be placed the same thickness as the mainline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

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

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

February 14, 2017

Published Date: 2nd Qtr. 2019	SDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER
			630.85
			Sheet 1 of 3



GENERAL NOTES:

All hardware shall be galvanized in accordance with ASTM A153.

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

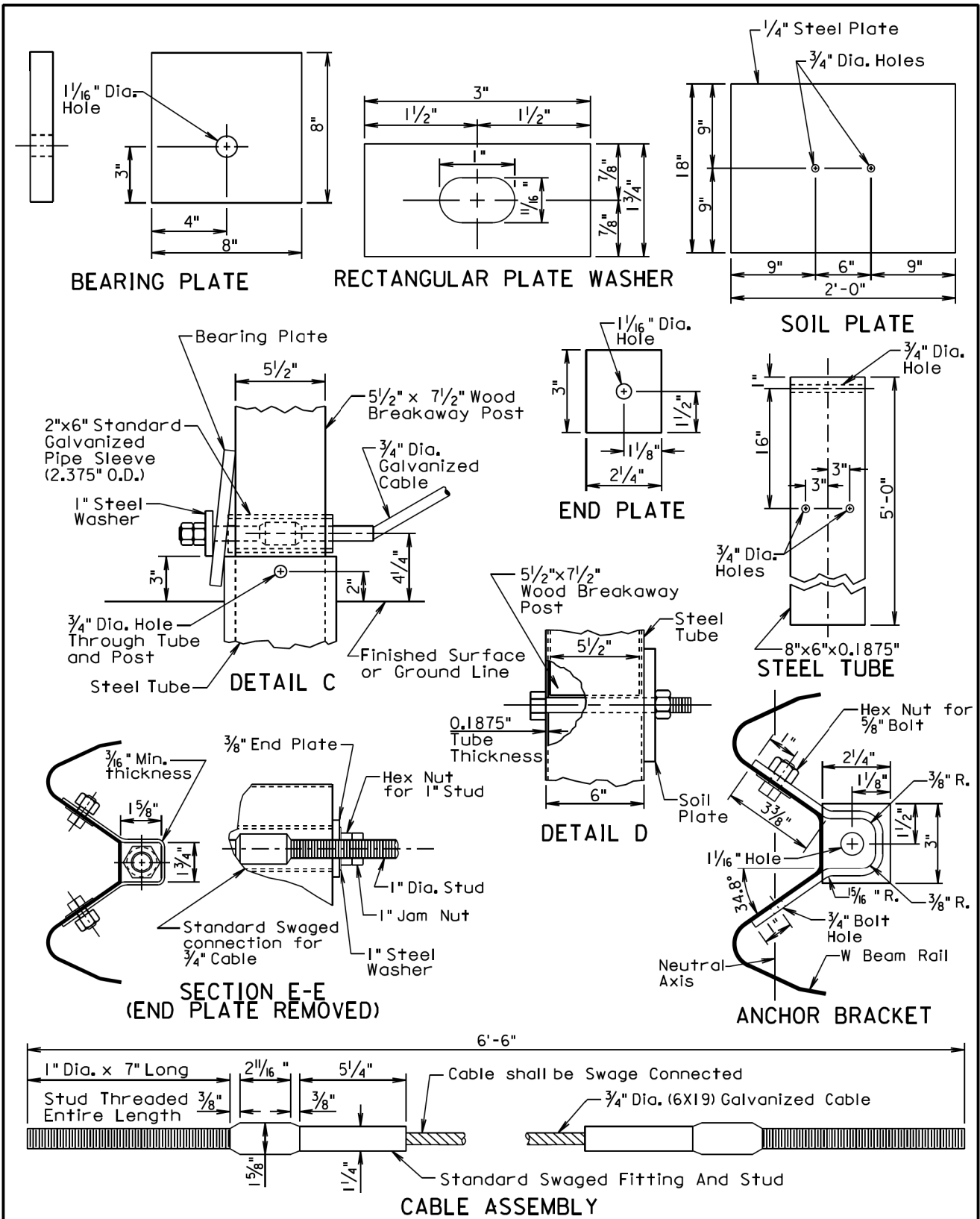
The anchor bracket, soil plate, and bearing plate shall be fabricated from steel that meets ASTM A36 Specifications. They shall be galvanized after fabrication in accordance with ASTM A123.

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

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

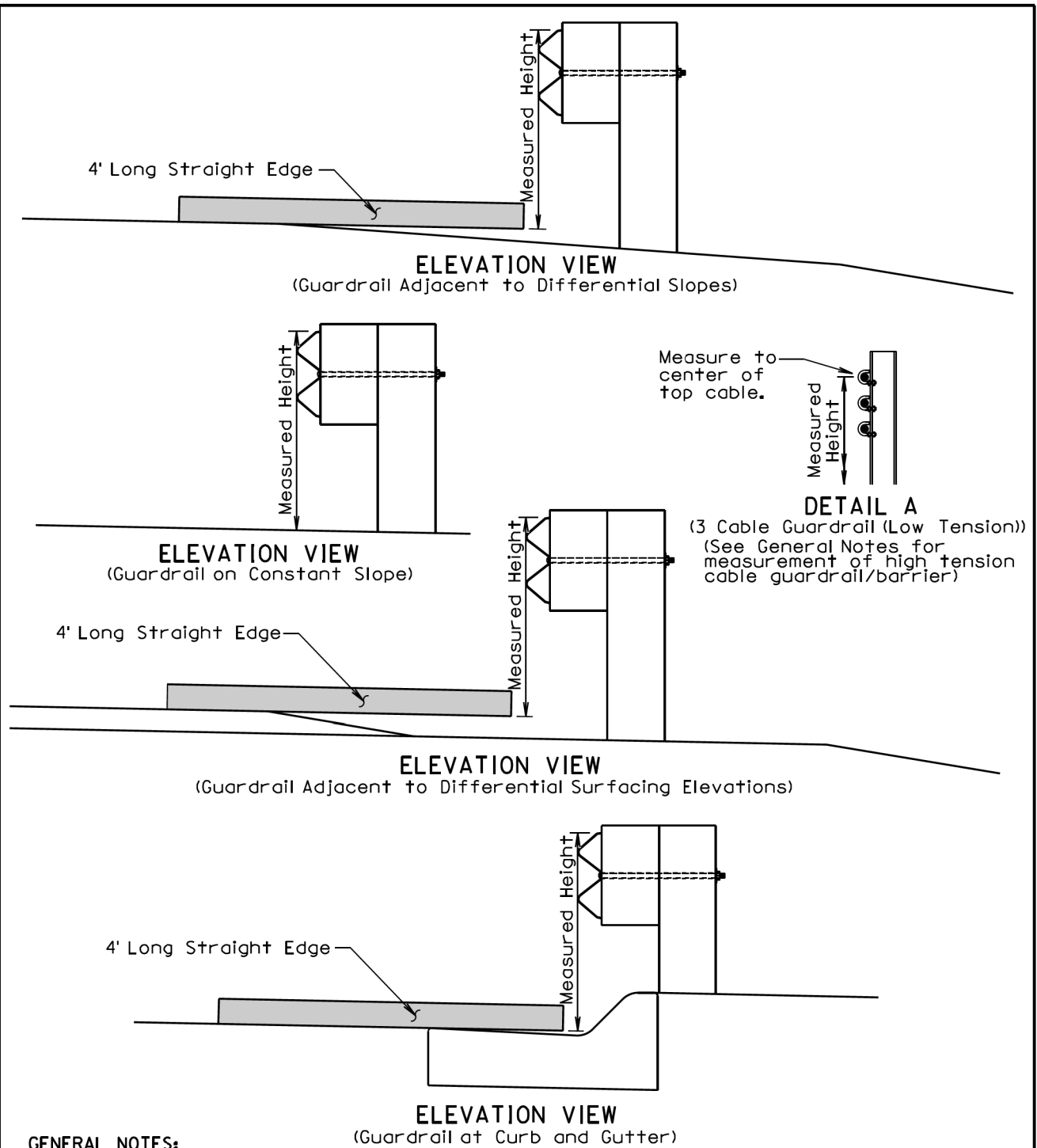
February 14, 2017

Published Date: 2nd Qtr. 2019	SDOT	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER
			630.85
			Sheet 2 of 3



February 14, 2017

Published Date: 2nd Qtr. 2019	S D D O T	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER
			630.85
			Sheet 3 of 3



GENERAL NOTES:

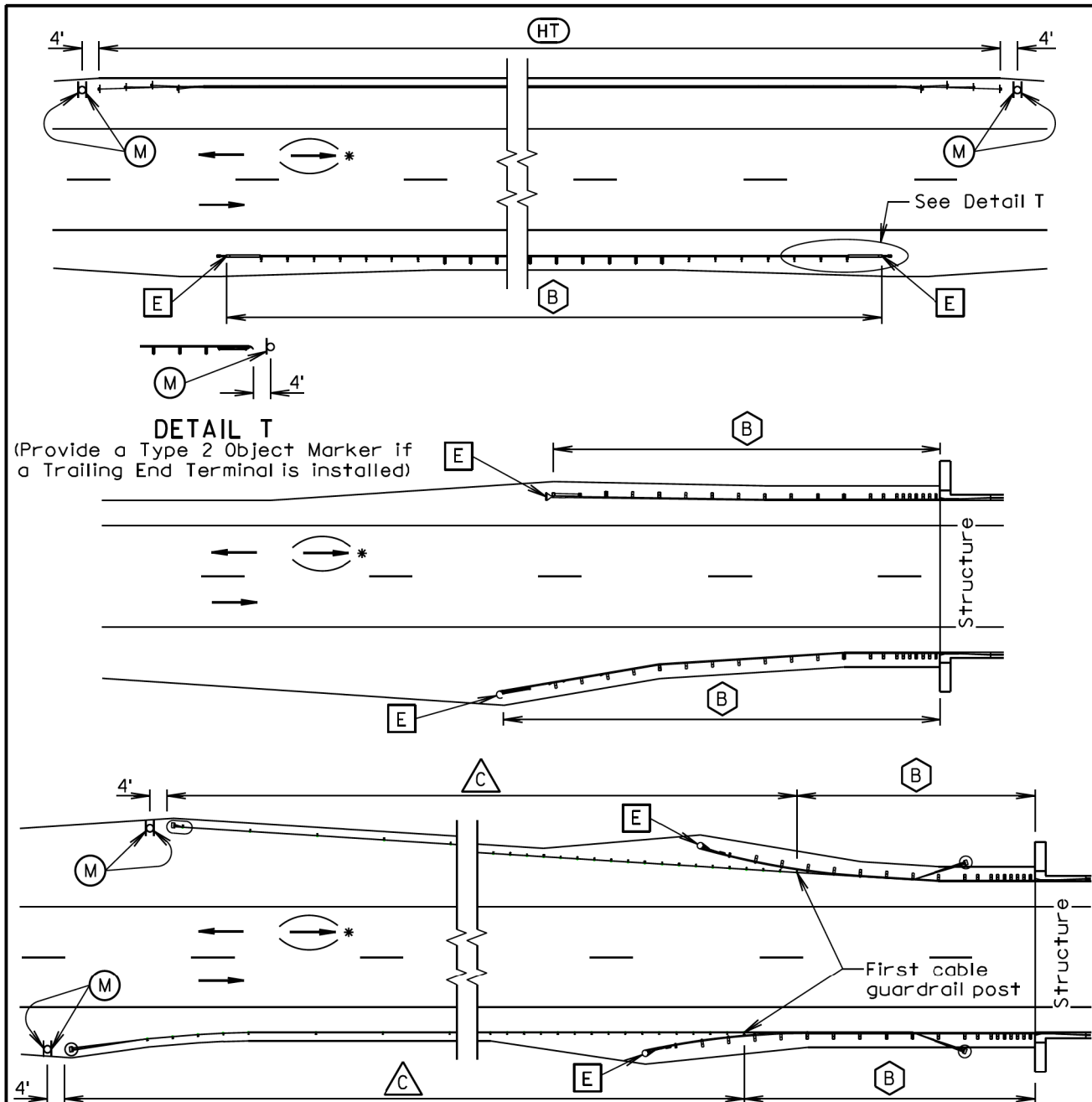
The W Beam guardrail shown is for illustrative purpose. The guardrail height for all types of guardrail systems except for high tension cable guardrail/barrier shall be measured in accordance with this standard plate.

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

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

December 23, 2017

Published Date: 2nd Qtr. 2019	S D D O T	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER
			630.99
			Sheet 1 of 1



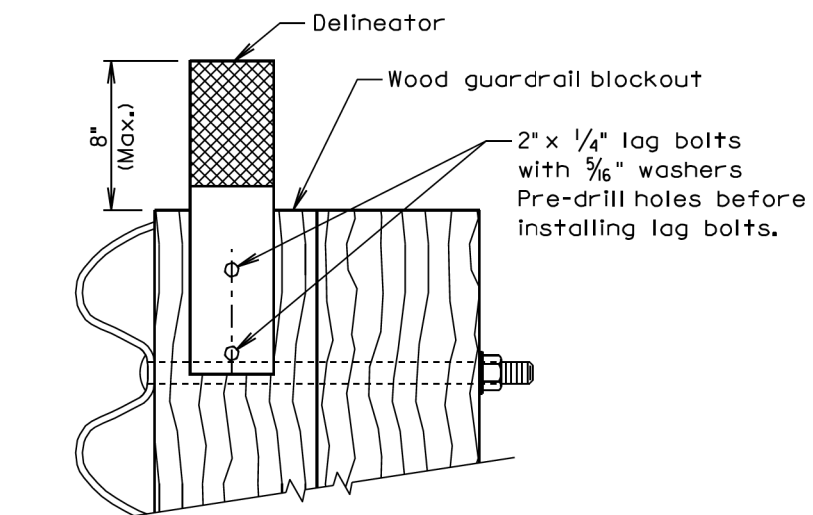
TYPICAL GUARDRAIL LAYOUTS

- | | |
|---|--|
| (B) Steel Beam Guardrail Delineation | (HT) High Tension Cable Guardrail Delineation |
| (E) Guardrail End Terminal Object Marker | (M) Type 2 Object Marker |
| (C) 3 Cable Guardrail Delineation | |

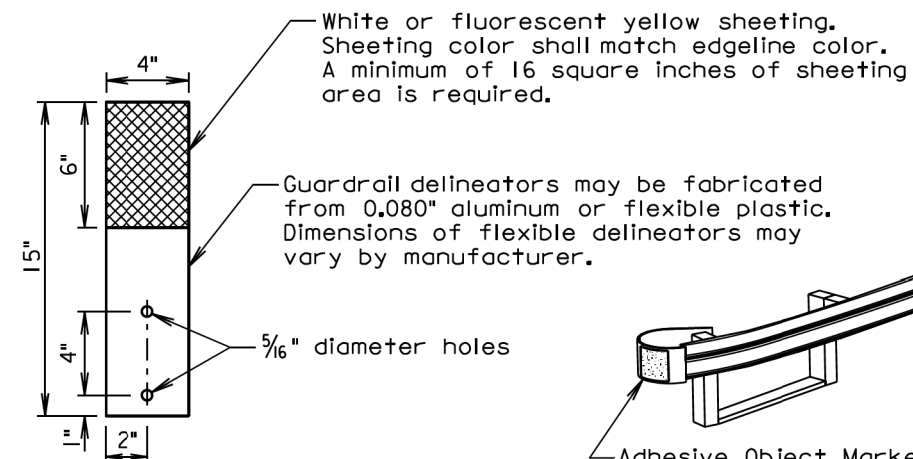
*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 9, 2017

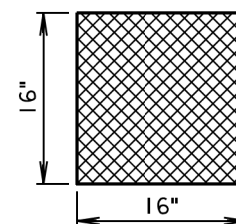
Published Date: 2nd Qtr. 2019	S D D O T	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 1 of 4



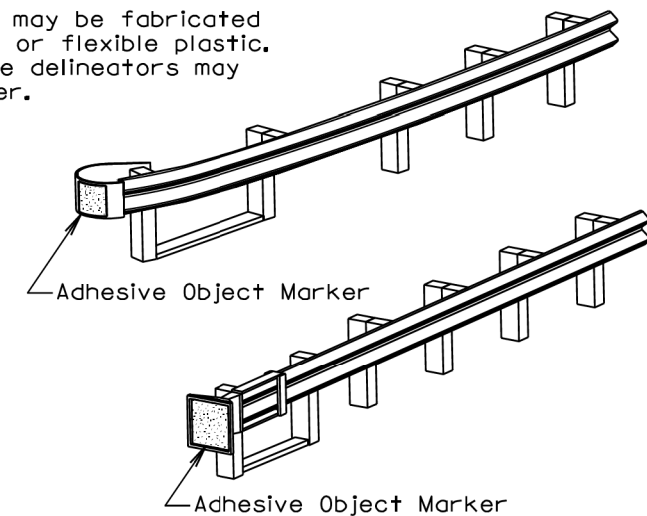
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



ADHESIVE OBJECT MARKER



(E) GUARDRAIL END TERMINAL OBJECT MARKER

June 9, 2017

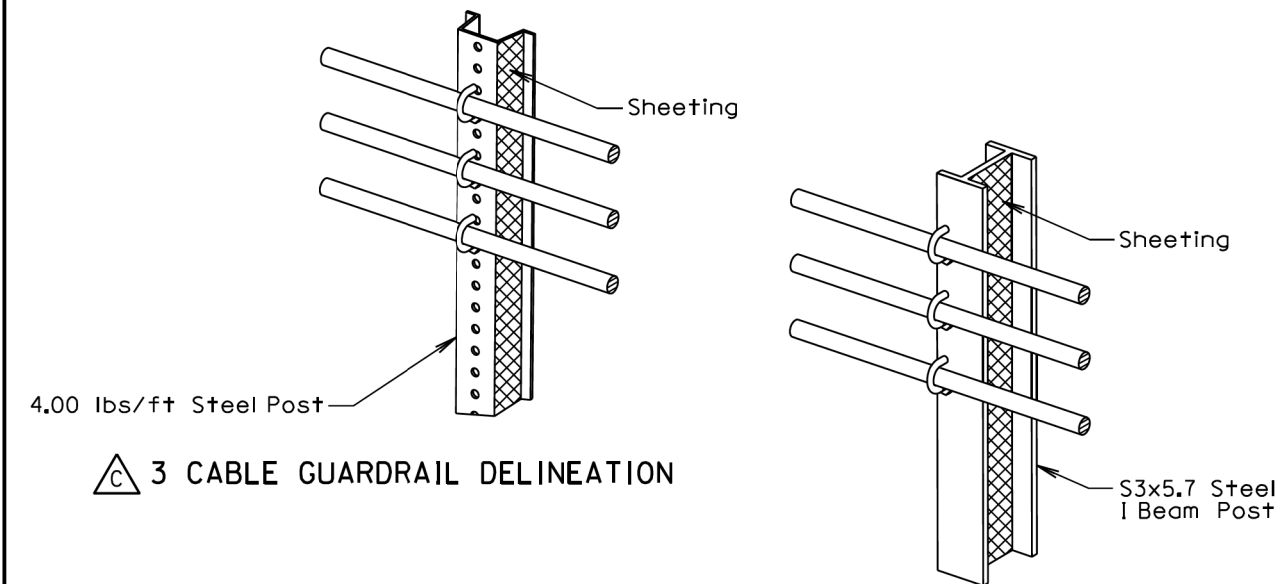
Published Date: 2nd Qtr. 2019	S D D O T	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 2 of 4

Plot Scale - 1:200

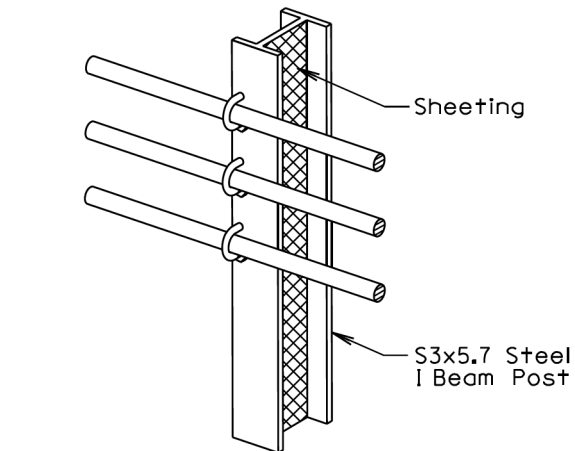
Plotted From - tw11nt19

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	34	36

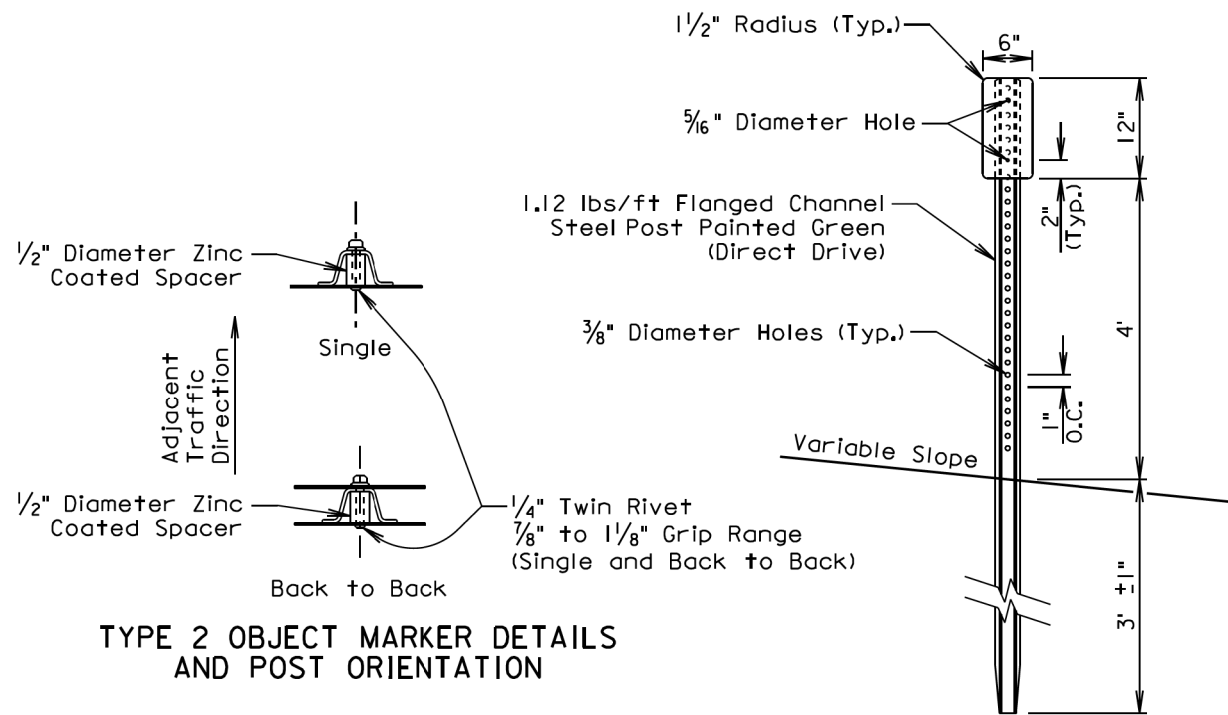
Plotting Date: 05/05/2019



△ 3 CABLE GUARDRAIL DELINEATION



△ 3 CABLE GUARDRAIL DELINEATION



**TYPE 2 OBJECT MARKER DETAILS
AND POST ORIENTATION**

Ⓜ TYPE 2 OBJECT MARKER
(For Marking 3 Cable Guardrail Anchor,
High Tension Cable Guardrail Anchor,
and Trailing End Terminal)

June 9, 2017

Published Date: 2nd Qtr. 2019	S D D O T	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 3 of 4

GENERAL NOTES:

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

The delineators for steel beam guardrail and sheeting on 3 cable guardrail posts shall be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting shall be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting shall be on both sides of the delineators and guardrail posts and shall be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

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

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

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

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

Steel beam guardrail that is not attached to a bridge and is 200 feet and greater in length, including steel beam guardrail transitioning to 3 cable guardrail, the delineators shall be placed at a spacing of approximately 50 feet. Delineation shall extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation on 3 cable guardrail and steel beam guardrail shall be included in the contract unit price per each for "Guardrail Delineator".

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

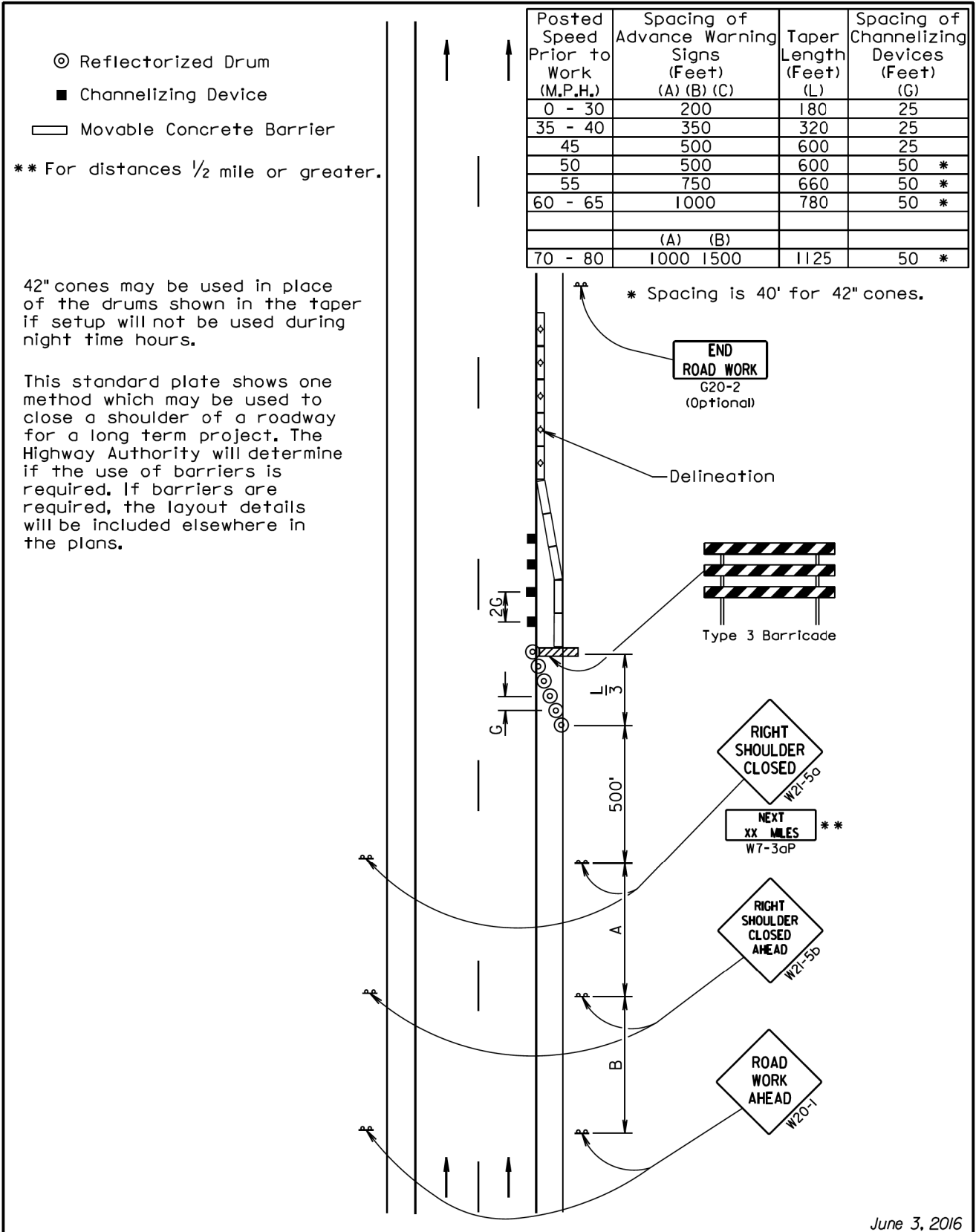
An adhesive object marker shall be placed on the end of the W beam guardrail or MGS end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

A type 2 object marker shall be placed adjacent to the 3 cable guardrail anchor, high tension cable guardrail anchor, and trailing end terminal at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") shall have fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware shall be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

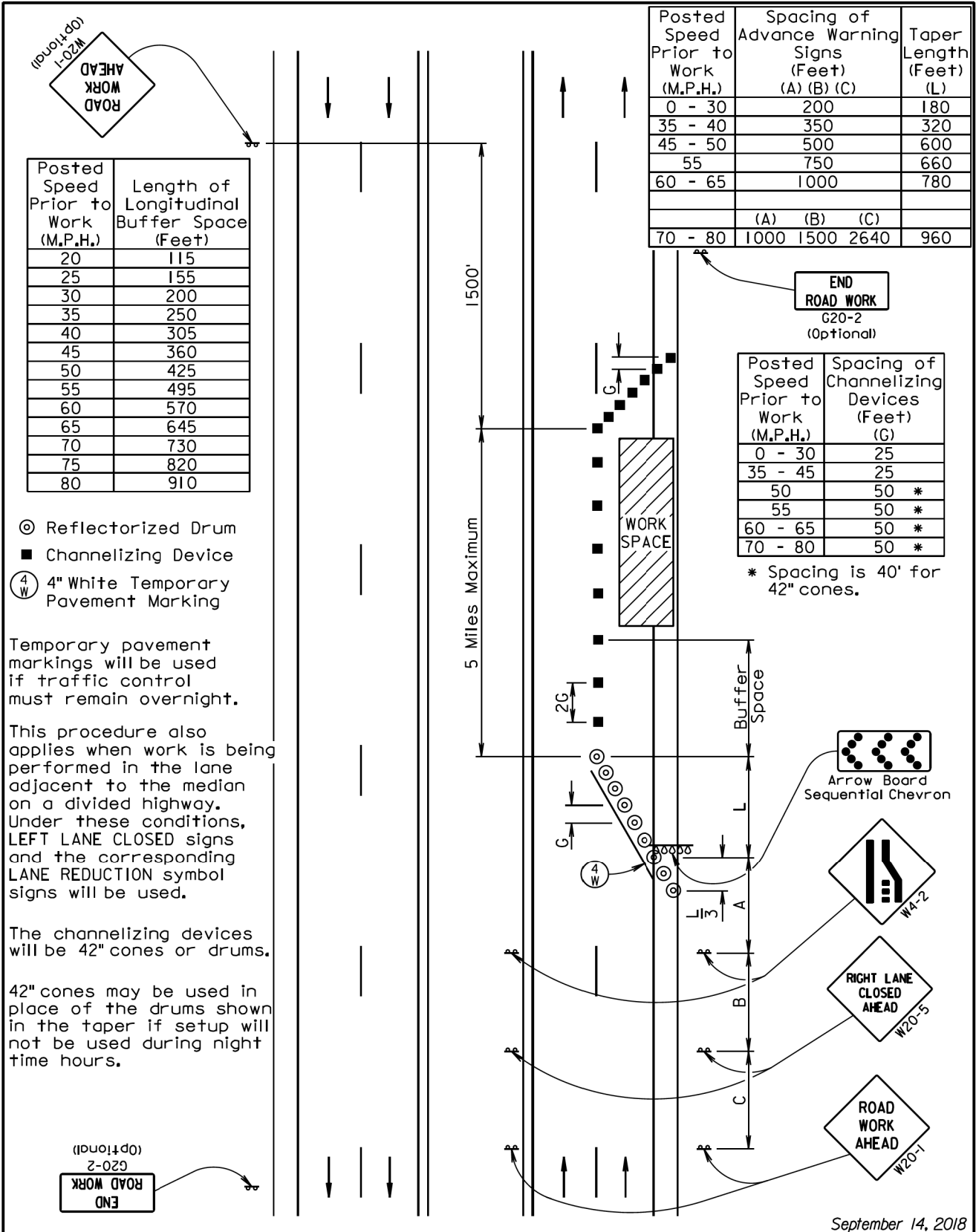
June 9, 2017

Published Date: 2nd Qtr. 2019	S D D O T	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4

File - ...15FQ ST Plates Template Set 1.dgn



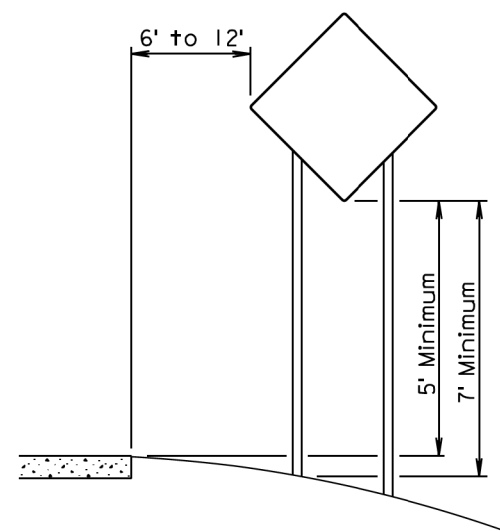
June 3, 2016



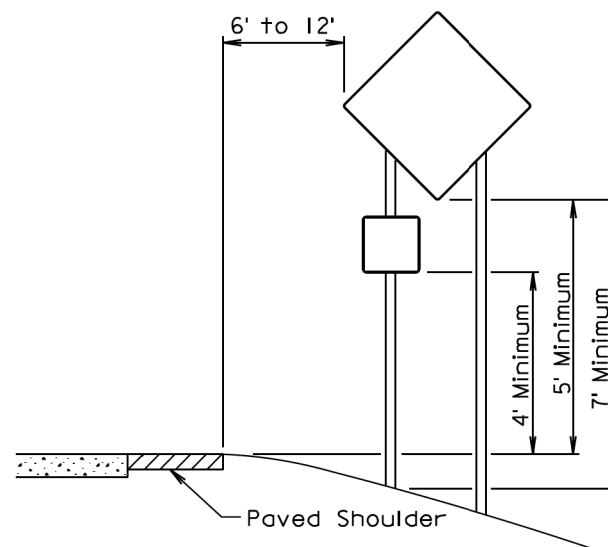
September 14, 2018

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	36	36

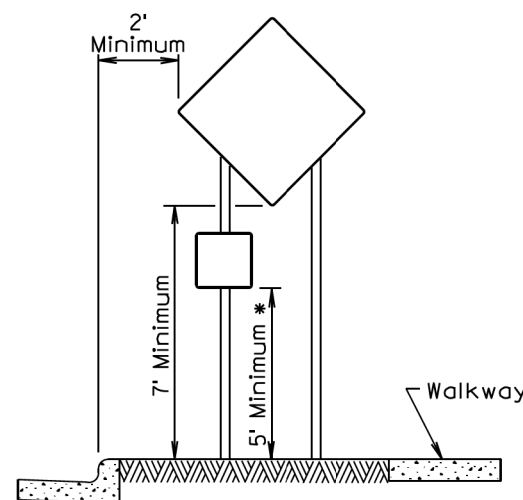
Plotting Date: 05/05/2019



RURAL DISTRICT

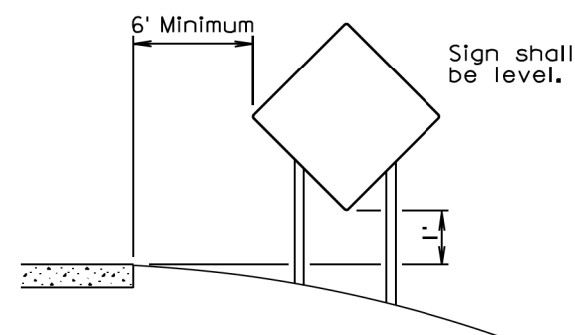


RURAL DISTRICT WITH
SUPPLEMENTAL PLATE



URBAN DISTRICT

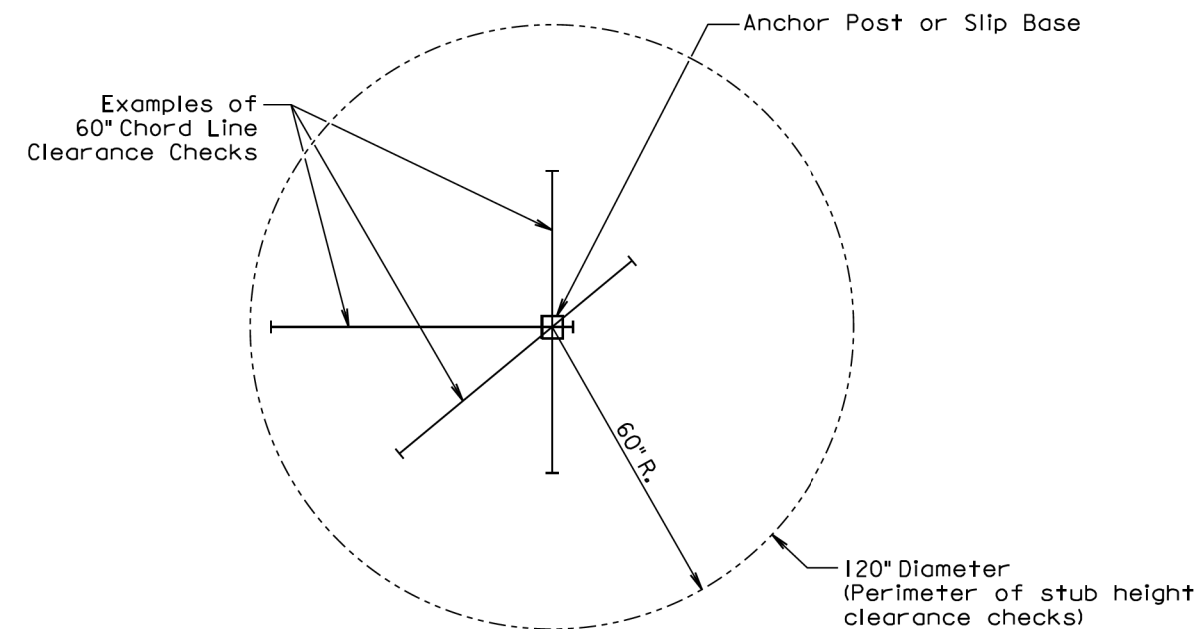
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



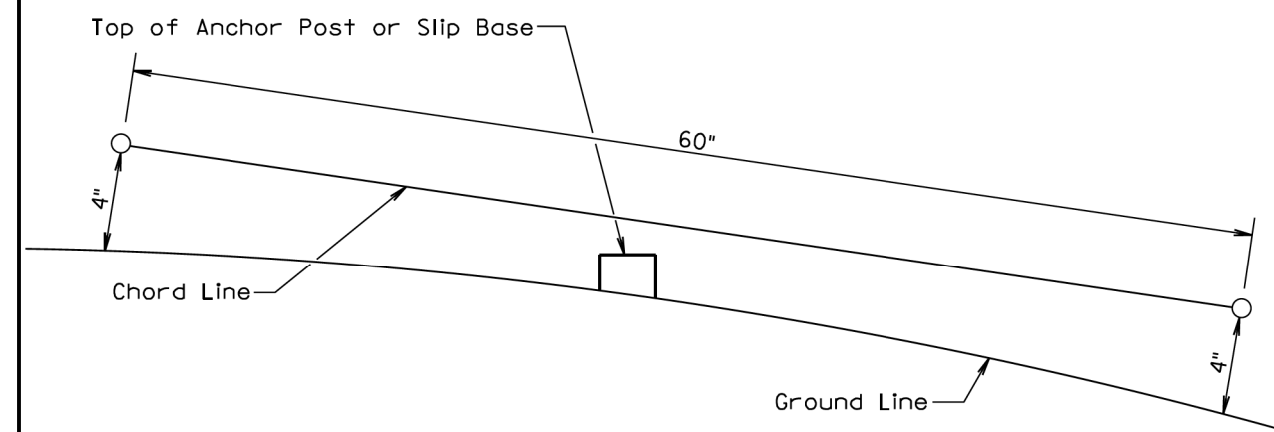
RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 2nd Qtr. 2019	S D D O T	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85
			Sheet 1 of 1



PLAN VIEW
(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

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

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

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

July 1, 2005

Published Date: 2nd Qtr. 2019	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1