

Plotting Date: 03/09/2023



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
090E-391 & 090W-391
INTERSTATE 90
JACKSON, JONES, & LYMAN COUNTIES

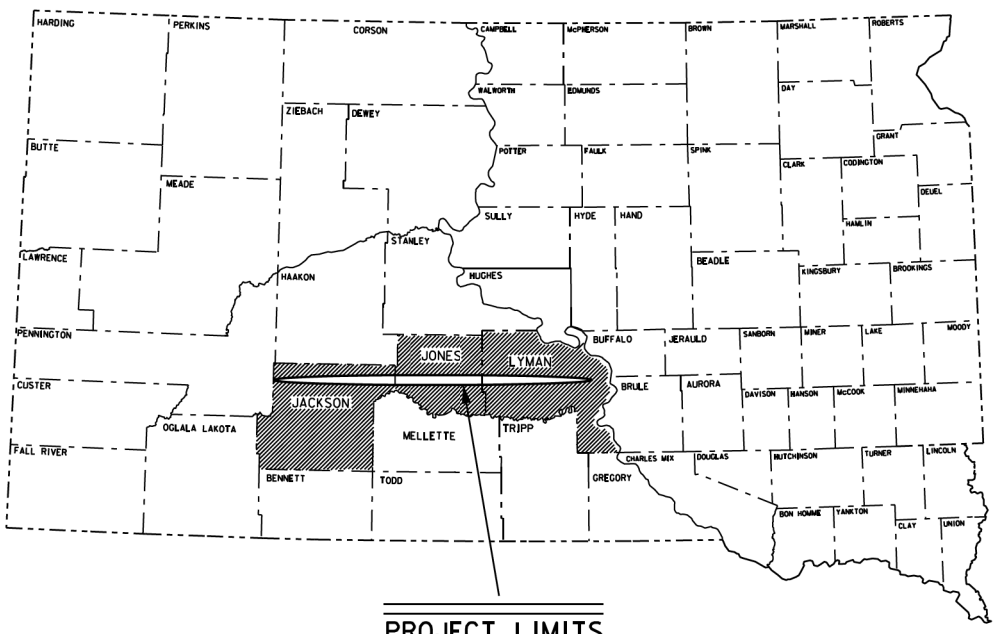
GUARDRAIL REPAIR AND/OR REPLACEMENT DUE TO DAMAGE ON INTERSTATE 90

PCN i74E

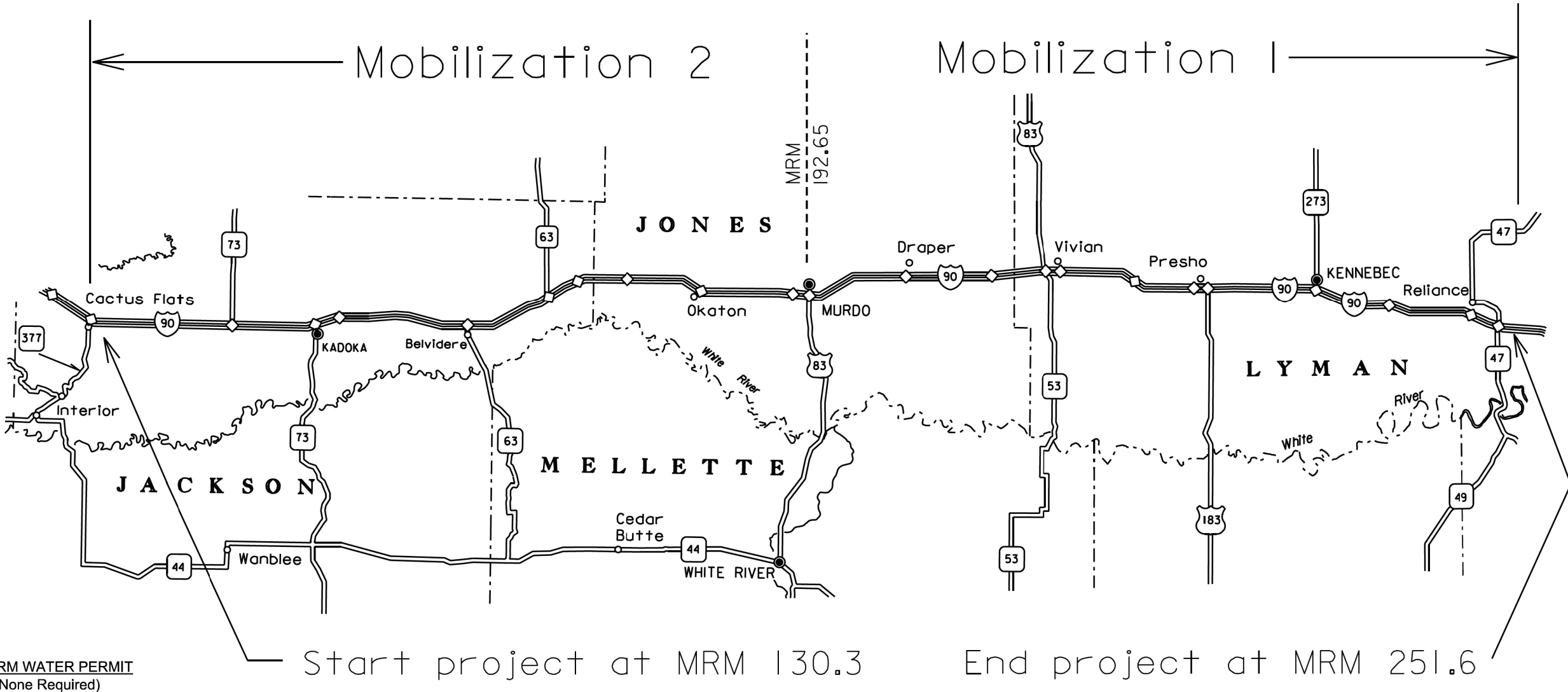
PLAN SHEET INDEX

Sheet 1	Title Sheet
Sheet 2	Estimate of Quantities
Sheets 3-6	Plan Notes
Sheets 7-11	Trinity CASS-S3 Manufacturer Plates
Sheets 12-38	Standard Plates

Plot Scale - 1:200



PROJECT LIMITS



STORM WATER PERMIT
(None Required)

Start project at MRM 130.3

End project at MRM 251.6

-Plotted From- TRW11N135

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ESTIMATE OF QUANTITIES
Non-Section Method

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	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
* 630E0200	Straight Class A Thrie Beam Rail	100.0	Ft
* 630E0210	Straight Class B Thrie Beam Rail	50.0	Ft

* - Denotes Non-Participating

Non-Section Method

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
* 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
* 630E2017	MGS MASH Flared End Terminal	1	Each
* 630E2018	MGS MASH 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
* 630E2100	Beam Guardrail Post	0	Each
* 630E2105	Beam Guardrail Block	0	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
* 630E5160	Reset W Beam Rail	25.0	Ft
* 630E5203	Reset MGS MASH Flared End Terminal	1	Each
* 630E5204	Reset MGS MASH Tangent End Terminal	1	Each
* 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	Lump Sum	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

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	0001-391	3	38

Plotting Date: 03/09/2023

ESTIMATE OF QUANTITIES

The Contractor will 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 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. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. 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: <<https://dot.sd.gov/media/documents/EnvironmentalProceduresManual.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 Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

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 pits, or staging areas associated with the project, cease construction activities in the affected area until the Whooping Crane departs and immediately 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 will 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) will 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) will 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 will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will 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 will 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) will 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 will 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 will 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 will 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.

STATE OF SOUTH DAKOTA	PROJECT 0001-391	SHEET 4	TOTAL SHEETS 38
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Plotting Date: 03/09/2023

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES – Continued

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 100 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery 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 will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMPLETION DATE

The contract will become effective on July 1, 2023 and will expire on June 15, 2024.

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 will 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 will 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, will 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 will 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 will be conducted during daylight hours only. Traffic will be returned to the normal driving lanes during non-working hours. All construction operations will 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 will be equipped with an activated 360 degree, SAE J845, Class II or higher warning light to warn the traveling public.

Traffic control will 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 will be replaced immediately by the Contractor at the Contractor's expense.

The Contractor will 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) will be 30" x 30" and will 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) will 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 will 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 will be incidental to the contract unit prices for the various items. Cost to remove and dispose of damaged guardrail items will be incidental to the contract unit prices for the various items. The Contractor and Engineer will negotiate installation costs for added items which vary significantly from contract items.

HIGH TENSION GUARDRAIL

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

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

HIGH TENSION GUARDRAIL - 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 will 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 will 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 will be incidental to the contract unit price per each for "W Beam Guardrail End Terminal". If W Beam posts and blocks are needing to be replaced, they be paid under their respective bid items "Beam Guardrail Post" and "Beam Guardrail Block" these prices include all costs for furnishing and installation. All W Beam guardrail end terminals, posts and blocks that are replaced will 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 will 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 will be incidental to the contract unit price per each for "MGS End Terminal". If posts and blocks are needing to be replaced, they will be paid under their respective bid items "Beam Guardrail Post" and "Beam Guardrail Block" these prices include all costs for furnishing and installation. All MGS guardrail end terminals, posts and blocks that are replaced will be selected from the South Dakota Department of Transportation Approved Product List.
4. 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.

GUARDRAIL-Continued

5. "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.
6. "3 Cable Guardrail Post, Winter" is the additional cost for removal and installation of a 3 Cable Guardrail Post (1 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.
7. "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.
8. "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.
9. "3 Cable Guardrail Intermediate Post" includes the cost for both 1 Beam and Flanged type of posts. The post for this item will be furnished and installed consistent with the type of posts presently in place at the proposed repair site.
10. "Beam Guardrail Post and Block" will include the appropriate size wood block. The Engineer will designate the proper post length of six, six and one-half, or seven feet as needed to fit the repair situation.
11. The Contractor will 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 will 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 will 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 will be incidental to the contract unit price per cubic yard for "Base Course, State Furnished".

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

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

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor will provide a suitable site for Contractor furnished borrow material. The borrow material will 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 will be incidental to the contract unit price per cubic yard for "Contractor Furnished Borrow Excavation". Compaction of borrow material will 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 will be the responsibility of the Contractor.

RESTORATION OF DISTURBED AREAS

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

Slopes and berms disturbed will be leveled and excess material removed. Area will 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 will be noxious weed free. Cost for reshaping, leveling, removal of excess material, tilling, and seeding disturbed areas on the slopes and berms will be incidental to the contract unit price for the various items.

ITEMIZED LIST OF TRAFFIC CONTROL DEVICES

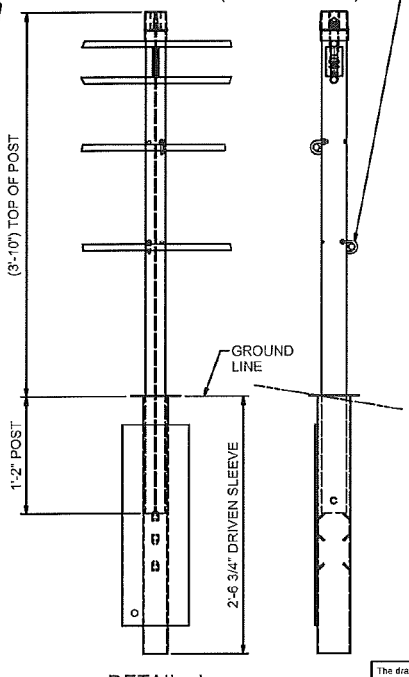
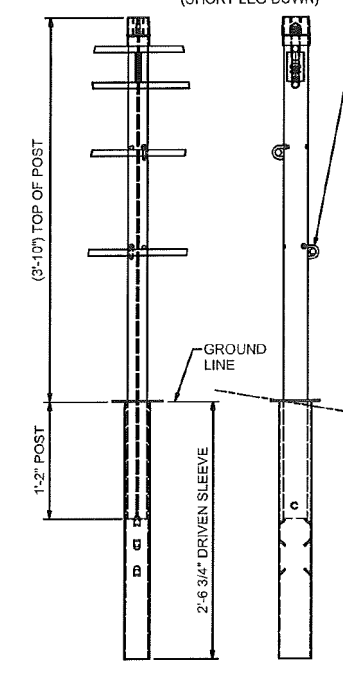
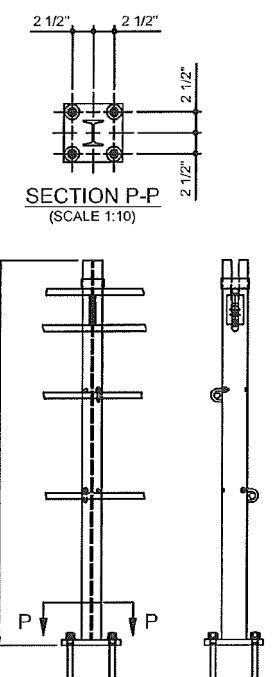
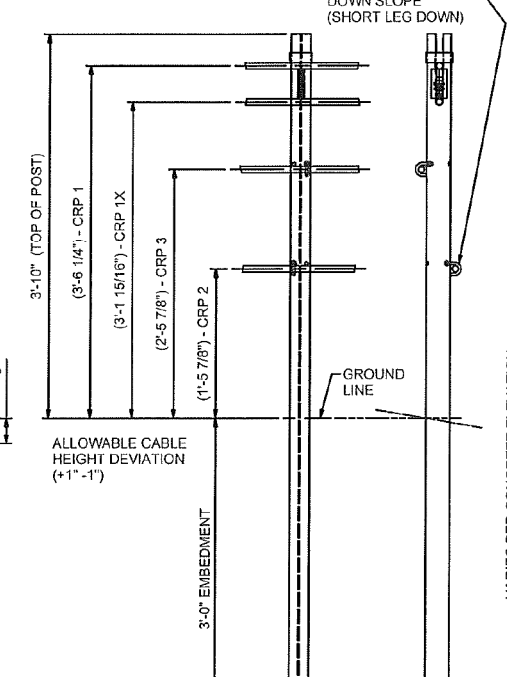
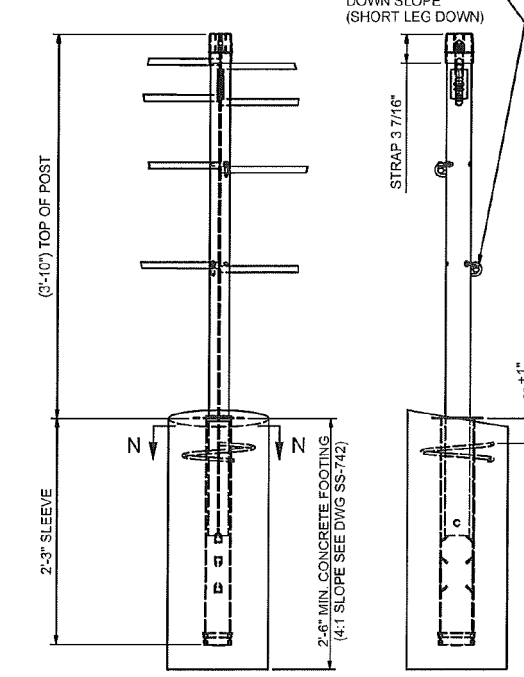
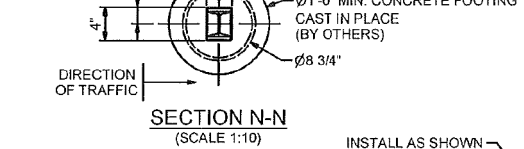
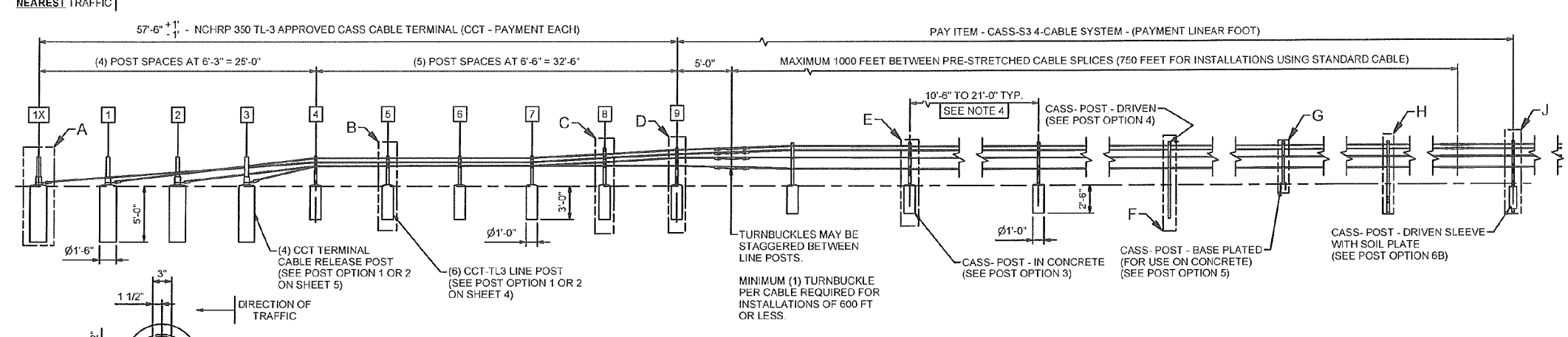
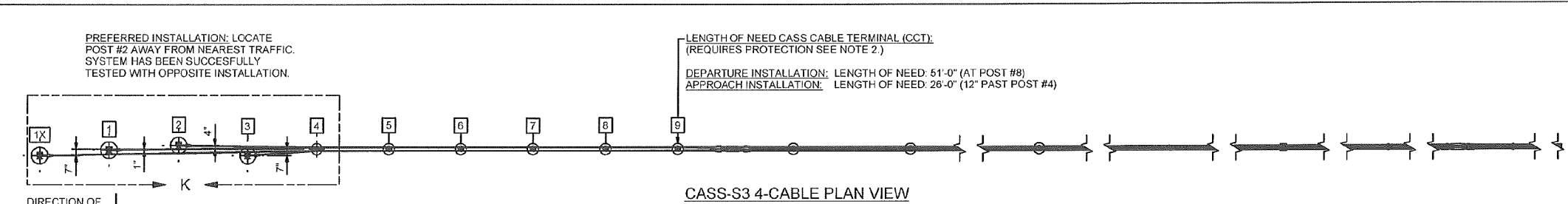
ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

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

Plotting Date: 03/09/2023



- NOTES:**
- CASS-S3 4-CABLE (4:1) HAS BEEN SUCCESSFULLY TESTED AND ACCEPTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 TEST LEVEL 3 (NCHRP 350 TL3) FOR VARIOUS POST SPACING WHEN INSTALLED ON A 4:1 OR FLATTER SLOPE. CASS-S3 4-CABLE (4:1) HAS BEEN SUCCESSFULLY TESTED AND ACCEPTED TO NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 TEST LEVEL 4 (NCHRP 350 TL4) FOR VARIOUS POST SPACING WHEN INSTALLED ON A 6:1 OR FLATTER SLOPE. ADDITIONAL INFORMATION CAN BE FOUND IN FHWA ACCEPTANCE LETTER B-141F.
 - CASS CABLE TERMINAL (CCT) HAS BEEN SUCCESSFULLY TESTED AND ACCEPTED TO NCHRP TL3. AN NCHRP 350 TL3 APPROVED TERMINAL (CCT) OR CASS-S3 4-CABLE (4:1) TRANSITION (VARIOUS) SHALL BE USED ON APPROACH AND DEPARTURE TERMINATIONS WHEN CASS-S3 4-CABLE (4:1) IS INSTALLED ON THE NATIONAL HIGHWAY SYSTEM (NHS). IF A NON-CRASHWORTHY ANCHOR (CCA) IS USED TO TERMINATE THE CABLE SYSTEM, THE NON-CRASHWORTHY ANCHOR MUST BE EITHER SHIELDED OR LOCATED SO THAT A VEHICLE IMPACTING THE CABLE CAN NOT IMPACT THE NON-CRASHWORTHY ANCHOR.
 - 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.
 - WHEN THE SYSTEM & TERMINAL IS INSTALLED ENTIRELY ON A 4:1 OR FLATTER SLOPE, THE DEPTH OF THE CONCRETE FOOTINGS SHALL BE INCREASED BY 6". (SEE DRAWING SS-742) ALL OTHER DIMENSIONS, VARIOUS SPECIFICATIONS AND SOIL QUALIFICATIONS REMAIN IN PLACE AND MUST BE FOLLOWED.
 - 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

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

TRINITY HIGHWAY PRODUCTS, LLC

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

PROJ: CASS-S3_6:1

Plot Scale - 1:200 TRW11NT35 - Plotted From -

File - ...174E_NonSectionMethod_Revision.dgn

Plotting Date: 03/09/2023

PARTS LIST - CASS-S3 POST - IN CONCRETE - POST OPTION #3			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 HEX NUT (A563 Gr.A)	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 HEX NUT (A563 Gr.A)	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

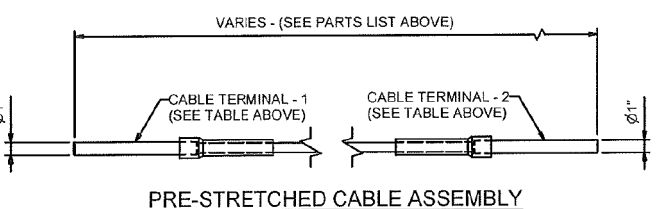
PARTS LIST - CASS-S3 POST BASE-PLATED - OPTION #5			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 HEX NUT (A563 Gr.A)	0.01
4	3300G	5/8" PLAIN WASHER - TYPE B - R - (F844)	0.06
4	3310G	5/8" LOCK WASHER	0.00
4	3361G	5/8" HEX NUT (A563 Gr DH)	0.01
2	4225G	CABLE LOCK BOLT (A307)	0.09
4	5225G	5/8 x 7 1/2" HAS 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 HEX NUT (A563 Gr.A)	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	13.67
1	34045G	CASS-S3 POST - SHORT	28.06
1	105201B	CASS-S3 POST CAP	0.13
1	105202T	CASS-S3 - POST STRAP	0.19

PARTS LIST - PRE-STRETCHED CABLE ASSEMBLIES						
QTY	PART No	TITLE	LENGTH	TERM-1	TERM-2	Lbs / Each
1	5817	CCT CABLE ASSEMBLY-TOP	54'-4"	R.H.T.	L.H.T.	58.3
1	5818	CCT CABLE ASSEMBLY-MID	48'-1"	R.H.T.	L.H.T.	52.3
1	5819	CCT CABLE ASSEMBLY-BOT	41'-10"	R.H.T.	L.H.T.	46.3
1	5867	CCA CABLE ASSEMBLY	25'-0"	R.H.T.	L.H.T.	30.9
1	5816	CABLE ASSEMBLY-INTERIOR	1000'	R.H.T.	L.H.T.	963.0
1	5753	CABLE FIELD SPICE SECTION	1025'	R.H.T.	NONE	968.0
1	5752	CABLE FIELD SPICE SECTION	1000'	R.H.T.	NONE	965.0
1	5759	CABLE FIELD SPICE SECTION	975'	R.H.T.	NONE	949.9
1	5797	CABLE FIELD SPICE SECTION	950'	R.H.T.	NONE	916.9
1	5796	CABLE FIELD SPICE SECTION	925'	R.H.T.	NONE	882.8
1	5795	CABLE FIELD SPICE SECTION	900'	R.H.T.	NONE	868.8
1	5794	CABLE FIELD SPICE SECTION	875'	R.H.T.	NONE	844.7
1	5793	CABLE FIELD SPICE SECTION	850'	R.H.T.	NONE	820.7
1	5792	CABLE FIELD SPICE SECTION	825'	R.H.T.	NONE	796.6
1	5791	CABLE FIELD SPICE SECTION	800'	R.H.T.	NONE	772.6
1	5790	CABLE FIELD SPICE SECTION	775'	R.H.T.	NONE	748.5
1	5789	CABLE FIELD SPICE SECTION	750'	R.H.T.	NONE	724.5
1	5788	CABLE FIELD SPICE SECTION	725'	R.H.T.	NONE	700.4
1	5787	CABLE FIELD SPICE SECTION	700'	R.H.T.	NONE	676.4
1	5786	CABLE FIELD SPICE SECTION	675'	R.H.T.	NONE	652.3
1	5785	CABLE FIELD SPICE SECTION	650'	R.H.T.	NONE	628.3
1	5784	CABLE FIELD SPICE SECTION	625'	R.H.T.	NONE	604.2
1	5783	CABLE FIELD SPICE SECTION	600'	R.H.T.	NONE	580.2
1	5782	CABLE FIELD SPICE SECTION	575'	R.H.T.	NONE	556.1
1	5781	CABLE FIELD SPICE SECTION	550'	R.H.T.	NONE	532.1
1	5780	CABLE FIELD SPICE SECTION	525'	R.H.T.	NONE	508.0
1	5779	CABLE FIELD SPICE SECTION	500'	R.H.T.	NONE	484.0
1	5778	CABLE FIELD SPICE SECTION	475'	R.H.T.	NONE	459.9
1	5776	CABLE FIELD SPICE SECTION	450'	R.H.T.	NONE	435.9
1	5775	CABLE FIELD SPICE SECTION	425'	R.H.T.	NONE	411.8
1	5769	CABLE FIELD SPICE SECTION	400'	R.H.T.	NONE	387.8
1	5768	CABLE FIELD SPICE SECTION	375'	R.H.T.	NONE	363.7
1	5767	CABLE FIELD SPICE SECTION	350'	R.H.T.	NONE	339.7
1	5766	CABLE FIELD SPICE SECTION	325'	R.H.T.	NONE	315.7
1	5765	CABLE FIELD SPICE SECTION	300'	R.H.T.	NONE	291.6
1	5764	CABLE FIELD SPICE SECTION	275'	R.H.T.	NONE	267.6
1	5763	CABLE FIELD SPICE SECTION	250'	R.H.T.	NONE	243.5
1	5762	CABLE FIELD SPICE SECTION	225'	R.H.T.	NONE	219.5
1	5761	CABLE FIELD SPICE SECTION	200'	R.H.T.	NONE	195.4
1	5760	CABLE FIELD SPICE SECTION	175'	R.H.T.	NONE	171.4
1	5759	CABLE FIELD SPICE SECTION	150'	R.H.T.	NONE	147.3
1	5758	CABLE FIELD SPICE SECTION	125'	R.H.T.	NONE	123.3
1	5757	CABLE FIELD SPICE SECTION	100'	R.H.T.	NONE	99.2
1	5756	CABLE FIELD SPICE SECTION	75'	R.H.T.	NONE	75.2
1	5755	CABLE FIELD SPICE SECTION	50'	R.H.T.	NONE	51.1
1	5754	CABLE FIELD SPICE SECTION	25'	R.H.T.	NONE	27.1
1	5840	CABLE FIELD REPAIR SECTION	5'	R.H.T.	L.H.T.	10.8

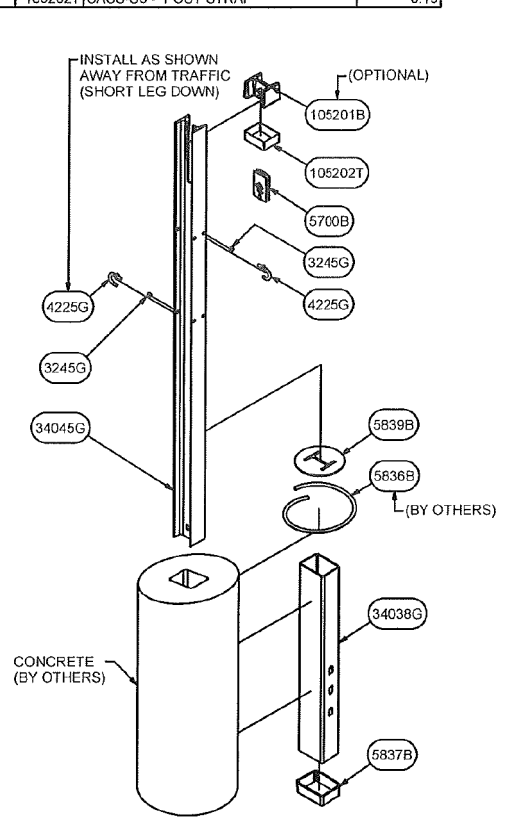
NOTE:

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

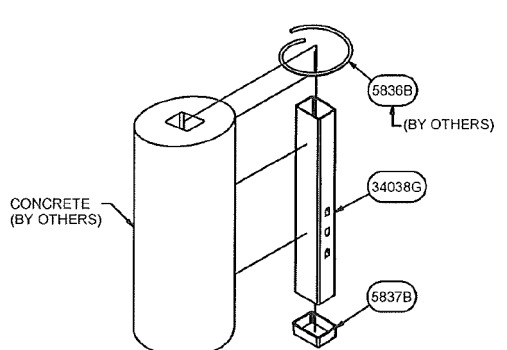


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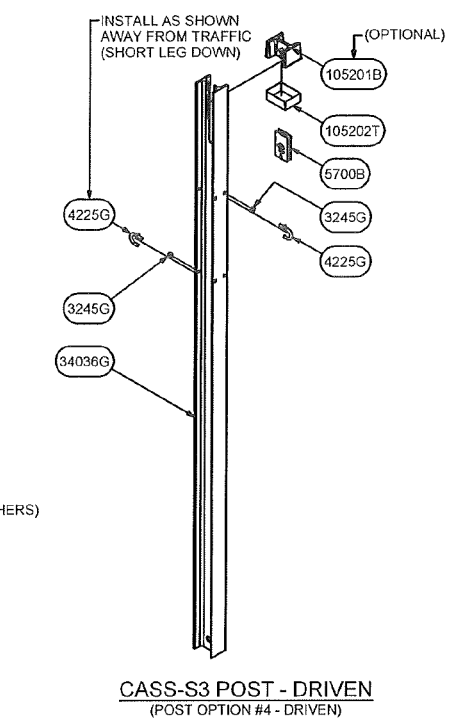
- IN LIEU OF BLACK SPACER 5700B SUPPLY YELLOW REFLECTIVE SPACER 5701B OR WHITE REFLECTIVE SPACER 5702. (AS REQUIRED PER PROJECT PLANS)
- IF INTERFERENCE OCCURS BETWEEN THE CABLE SPICE AND CASS-TL3 POST, SUPPLY A SPICE INTERFERENCE POST. LONG SPICE POST 34061G IN LIEU OF LONG CASS-S3 POST 34036G SHORT SPICE POST 34045G IN LIEU OF SHORT CASS-S3 POST 34045G
- 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)



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\"/>

- 5/8 ADHESIVE ANCHORING SYSTEM. (4 EACH 3300G, 3310G, 3361G & 5225G) & 0.6 EACH 5448B
- 5/8 x 8\"/>

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

PARTS LIST - CASS-S3 POST - IN DRIVEN SLEEVE - POST OPTION #6B			
QTY	PART No	TITLE	Lbs / Each
2	3245G	5/16 HEX NUT (A563 Gr.A)	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\"/>	

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Plot Scale: 1:200
- Plotted From: TRW11N135
File: ...174E_NonSectionMethod_Revision.dgn

Plotting Date: 03/09/2023

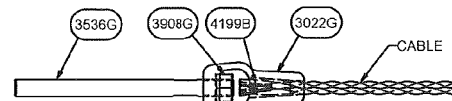
CASS TEMPERATURE & TENSION CHART (NEAREST 100 LB/F)

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

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

CABLE TENSION READINGS ARE TYPICALLY HIGHER IN CURVED CABLE SECTIONS.

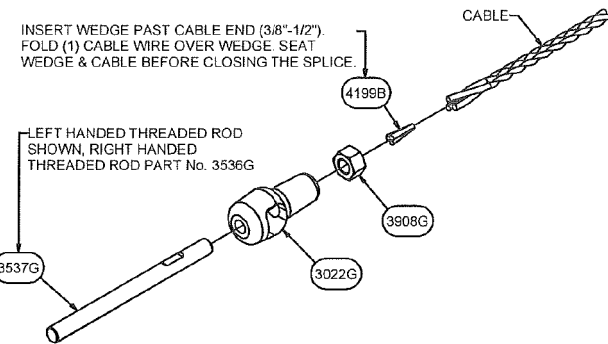
- NOTE:
- TURNBUCKLES SHALL BE INSTALLED WITH A MINIMUM OF 1-1/2" THREAD ENGAGEMENT. TO ALLOW FOR MAINTENANCE/REPAIR ADJUSTMENTS AT A LATER DATE, TRINITY SUGGESTS INSTALLER UTILIZE NO MORE THAN 4" THREAD ENGAGEMENT.
 - WHEN CUTTING CABLE LENGTHS IN THE FIELD FROM CABLE REELS, IT MAY BE PERMISSIBLE TO UTILIZE A CABLE TORPEDO SPLICE (4099G) BETWEEN TURNBUCKLES. DO NOT USE FOR CABLE LENGTH SHORTER THAN 100'. PLEASE CONTACT TRINITY, CONSULT TRINITY'S MANUAL OR SPECIFYING AGENCY TO DETERMINE IF APPROPRIATE FOR SPECIFIC APPLICATION.



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

PARTS LIST - 5910G

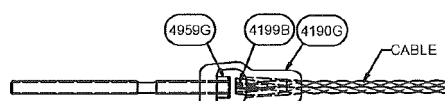
QTY	PART No	TITLE	Lbs / Each
1	3022G	1" CABLE END CASTING	0.56
1	3536G	1" STUD FLATTENED - R.H.T.	2.88
1	3908G	1" Ø HEAVY HEX NUT (A563 DH)	0.47
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08



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

PARTS LIST - 5909G

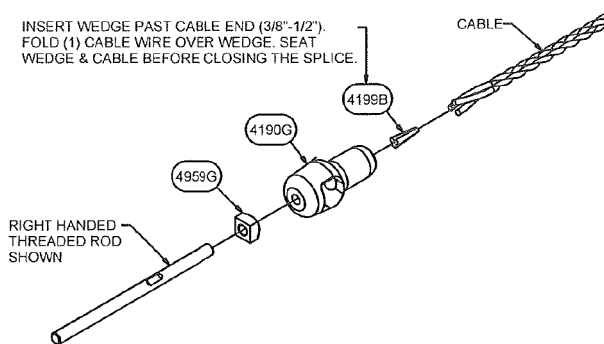
QTY	PART No	TITLE	Lbs / Each
1	3022G	1" CABLE END CASTING	0.56
1	3537G	1" STUD FLATTENED - L.H.T.	2.88
1	3908G	1" Ø HEAVY HEX NUT (A563 DH)	0.47
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08



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

PARTS LIST - 5634G

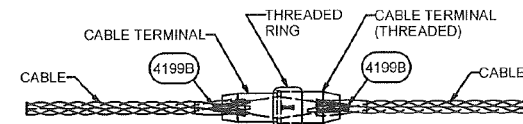
QTY	PART No	TITLE	Lbs / Each
1	105204G	3/4" STUD FLATTENED - L.H.T.	1.62
1	4190C	3/4" CABLE END CASTING	3.78
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08
1	4959G	3/4" HEAVY SQUARE NUT (A563)	0.26



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

PARTS LIST - 5635G

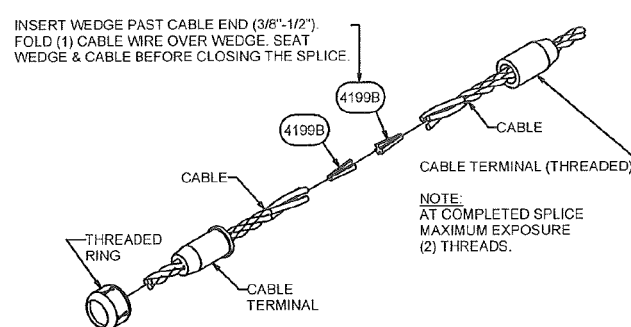
QTY	PART No	TITLE	Lbs / Each
1	105205G	3/4" STUD FLATTENED - R.H.T.	1.62
1	4190C	3/4" CABLE END CASTING	3.78
1	4199B	3/4" CABLE WEDGE (3 x 7)	0.08
1	4959G	3/4" HEAVY SQUARE NUT (A563)	0.26



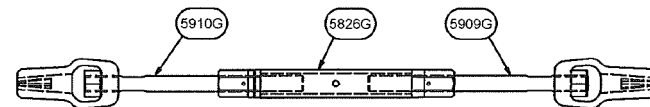
TORPEDO CABLE SPLICE - 4099G

PARTS LIST - 4099G

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



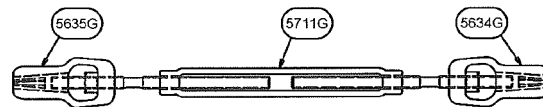
ASSEMBLY - TORPEDO CABLE SPLICE 4099G



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

PARTS LIST - 5633G

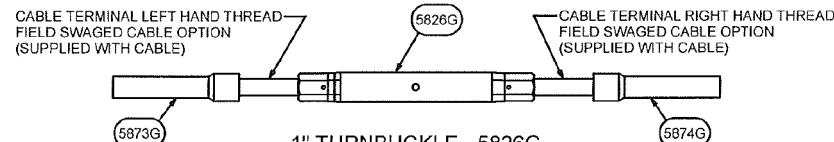
QTY	PART No	TITLE	Lbs / Each
1	5826G	1" CASS TURNBUCKLE CLOSED BODY STYLE	4.82
1	5909G	1" STUD ASSEMBLY L.H.T.	3.99
1	5910G	1" STUD ASSEMBLY R.H.T.	3.99



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

PARTS LIST - 5698G

QTY	PART No	TITLE	Lbs / Each
1	5634G	3/4" STUD ASSEMBLY L.H.T.	5.74
1	5635G	3/4" STUD ASSEMBLY R.H.T.	5.74
1	5711G	3/4-12 TURNBUCKLE OPEN BODY	2.57



1" TURNBUCKLE - 5826G
(CLOSED BODY STYLE)

PARTS LIST - 5826G - SWAGED TERMINALS NOT SUPPLIED

QTY	PART No	TITLE	Lbs / Each
1	5826G	1" CASS TURNBUCKLE CLOSED BODY STYLE	4.82
1	5873G	CASS STUD ASSEMBLY - SWAGED - LHT	3.97
1	5874G	CASS STUD ASSEMBLY - SWAGED - RHT	3.97

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PROJECT: CASS-S3_6:1

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



SPEC:	
SHIPPING WT:	
DRW: E.A.S.	11/4/2010
CHK:	
SHT: 3 OF 5	SIZE: D
DWG NO:	REV
SS-743	0

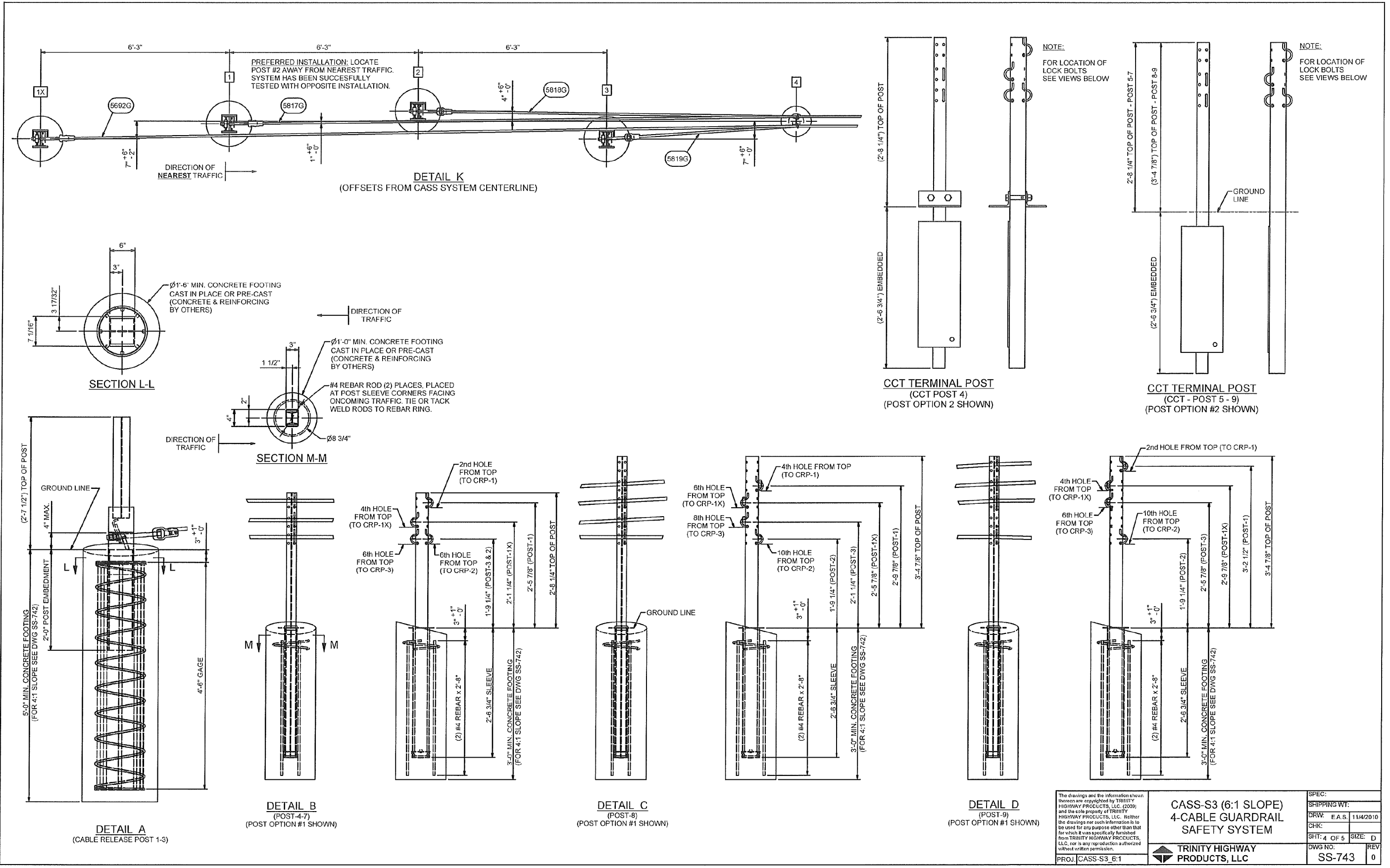
Plot Scale - 1:200

Plotted From - TRW11N135

File - ...174E_NonSectionMethod_Revision.dgn

Plotting Date: 03/09/2023

Plot Scale - 1:200



File: SS-743_TL4_SS_6T1_4C.dwg

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

TRINITY HIGHWAY PRODUCTS, LLC

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

PROJ: CASS-S3_6:1

File: ...174E_NonSectionMethod_Revised.dgn

Plotting Date: 03/09/2023

PARTS LIST - CCT CABLE RELEASE POST No. 1X-3 - IN CONCRETE			
QTY	PART No	TITLE	Lbs / Each
2	3240G	5/16 ROUND WASHER WIDE (F844)	0.02
2	3245G	5/16 HEX NUT (A563 Gr.A)	0.01
2	4211G	5/16 HEX BOLT x 1 3/4" - 1 1/8 RHT (A307)	0.05
1	5851B	REFLECTOR - MEDIAN - YELLOW	0.10
1	33909G	CASS CABLE BRACKET	1.92
1	33919B	REINFORCING CAGE - CRP POST	62.97
1	33934A	CRP - LOWER POST	51.80
1	33935A	CRP - UPPER POST	31.57

PARTS LIST - CCT TERMINAL POST No. 4-7 - IN CONCRETE			
QTY	PART No	TITLE	Lbs / Each
4	3245G	5/16 HEX NUT (A563 Gr.A)	0.01
1	5825G	CABLE LOCK BOLT (A307)	0.12
1	5836B	CONCRETE REINFORCING RING	0.88
1	5837B	SLEEVE CAP - CASS-TERMINAL POST	0.12
1	5839B	SLEEVE COVER - S3 POST	0.11
2	5919B	#4 REBAR - TERMINAL POST	1.78
1	33908B	SLEEVE - TERMINAL LINE POST	13.80
1	33910G	350-TL3 TERMINAL POST	28.63

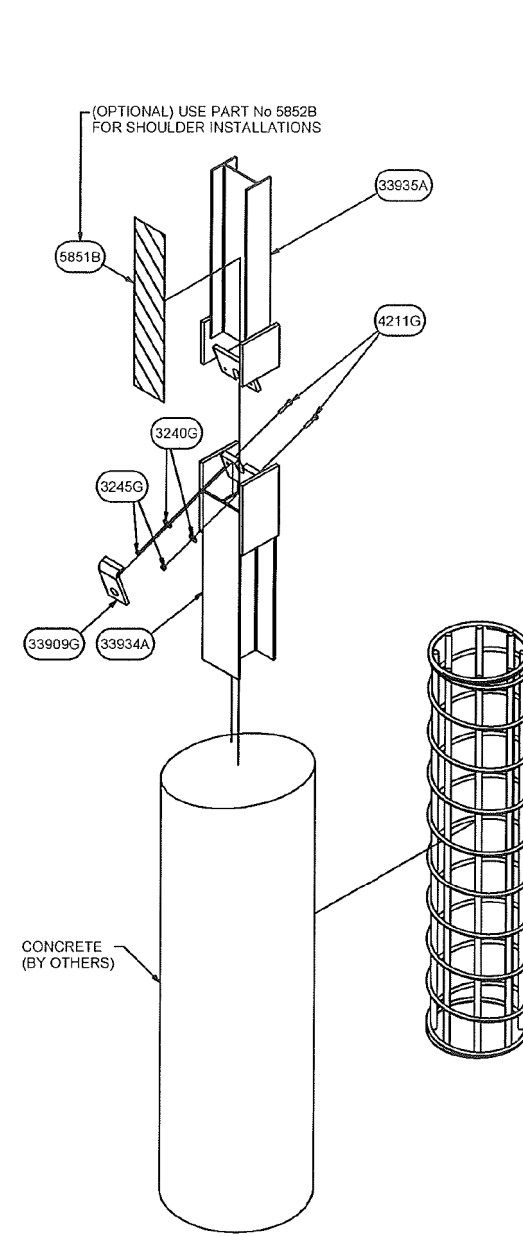
PARTS LIST - CCT CABLE RELEASE POST No. 1X-3 - DRIVEN			
QTY	PART No	TITLE	Lbs / Each
2	3240G	5/16 ROUND WASHER WIDE (F844)	0.02
2	3245G	5/16 HEX NUT (A563 Gr.A)	0.01
2	4211G	5/16 HEX BOLT x 1 3/4" - 1 1/8 RHT (A307)	0.05
1	5851B	REFLECTOR - MEDIAN - YELLOW	0.10
1	33909G	CASS CABLE BRACKET	1.92
1	33935A	CRP - UPPER POST	31.57
1	33936A	CRP - LOWER POST	178.68

PARTS LIST - CCT TERMINAL POST No. 4-7 WITH SOIL PLATE			
QTY	PART No	TITLE	Lbs / Each
4	3245G	5/16 HEX NUT (A563 Gr.A)	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)	0.08
4	5825G	CABLE LOCK BOLT (A307)	0.12
2	9021G	BEARING ANGLE (A36)	3.81
1	33903A	350-TL3 TERMINAL POST w/ SOIL PLATE	42.25

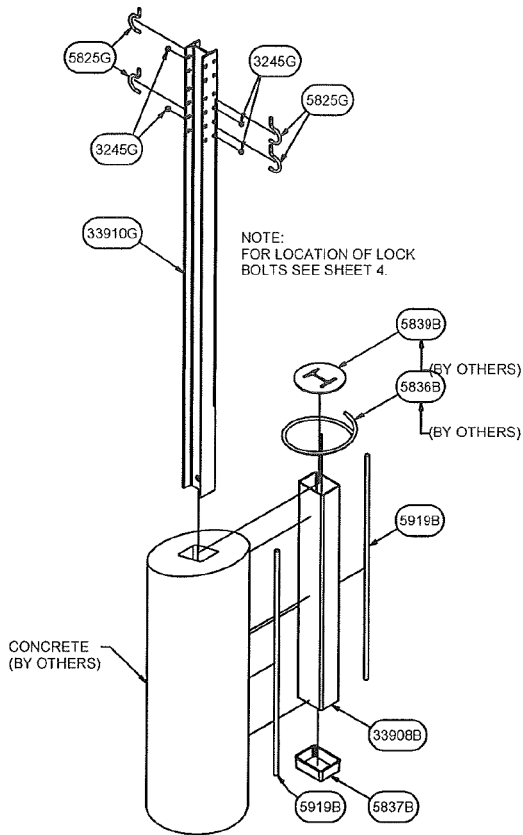
PARTS LIST - CCT TERMINAL POST No. 8-9 - WITH SOIL PLATE			
QTY	PART No	TITLE	Lbs / Each
4	3245G	5/16 HEX NUT (A563 Gr.A)	0.01
4	5825G	CABLE LOCK BOLT (A307)	0.12
1	33989A	350-TL4 TERMINAL POST w/ SOIL PLATE	46.02

PARTS LIST - CCT TERMINAL POST No. 8-9 - IN CONCRETE			
QTY	PART No	TITLE	Lbs / Each
4	3245G	5/16 HEX NUT (A563 Gr.A)	0.01
4	5825G	CABLE LOCK BOLT (A307)	0.12
1	5836B	CONCRETE REINFORCING RING	0.88
1	5837B	SLEEVE CAP - CASS-TERMINAL POST	0.12
1	5839B	SLEEVE COVER - S3 POST	0.11
2	5919B	#4 REBAR - TERMINAL POST	1.78
1	33908B	SLEEVE - TERMINAL LINE POST	13.80
1	33955G	350-TL4 TERMINAL POST	32.42

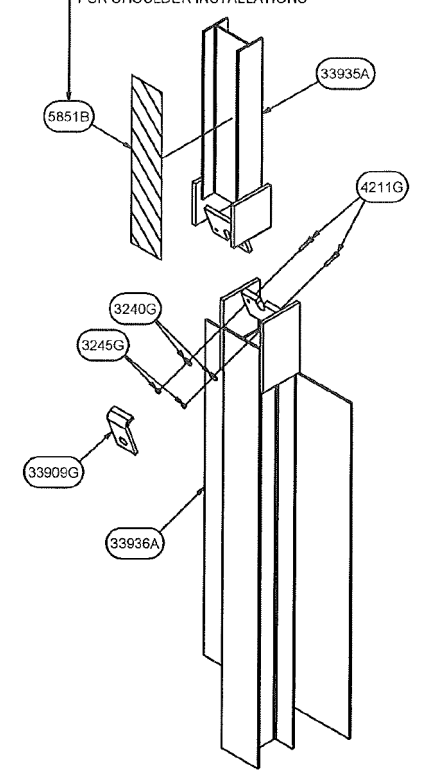
ALL HARDWARE FOR THE CCT CAN BE ORDERED AS ONE PACKAGE:
 PART No. 33598G: (1) SET OF TERMINAL HARDWARE FOR 1" CABLE FITTINGS.
 PART No. 33599G: (1) SET OF TERMINAL HARDWARE FOR 3/4" CABLE FITTINGS.



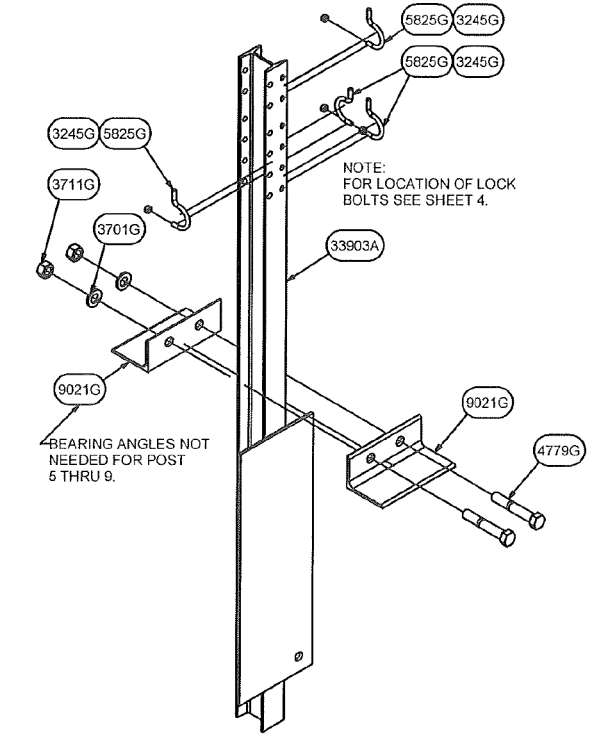
CRP TERMINAL POST - IN CONCRETE
 (CCT TERMINAL POST 1X - 3)
 (POST OPTION #1 SHOWN)



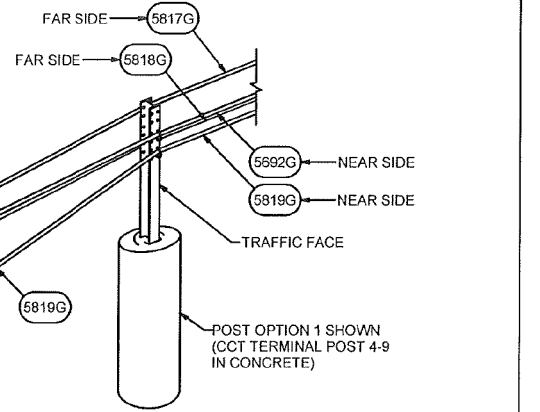
TERMINAL POST - IN CONCRETE
 (CCT TERMINAL POST 4 - 7)
 (POST OPTION #1 SHOWN)



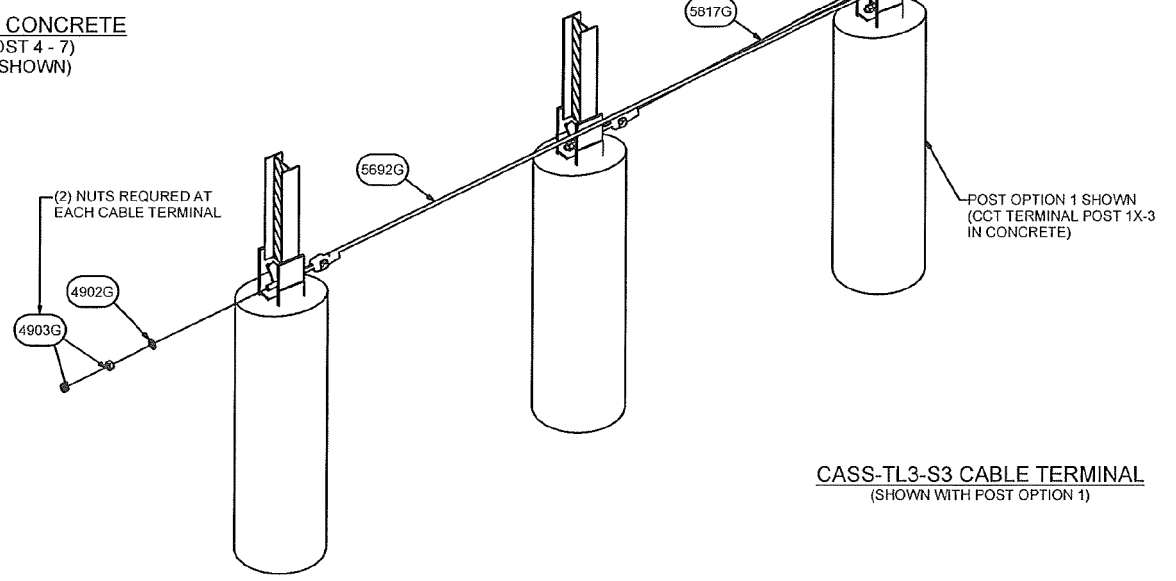
CRP TERMINAL POST - DRIVEN
 (CCT TERMINAL POST 1X - 3)
 (POST OPTION #2 SHOWN)



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



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



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

HARDWARE CASS CABLE TERMINAL - CCT			
QTY	PART No	TITLE	Lbs / Each
4	4902G	1" Ø CIRCULAR WASHER (F436)	0.11
8	4903G	1" HEX NUT (A194 2H)	0.33
1	5692G	CRP - 4th CABLE ASSEMBLY [6'0"]	116.91
1	5817G	CRP - TOP CABLE ASSEMBLY [5'4'-3"]	107.59
1	5818G	CRP - MIDDLE CABLE ASSEMBLY [4'0'-0"]	98.09
1	5819G	CRP - BOTTOM CABLE ASSEMBLY [4'1'-9"]	88.85
4	33909G	CASS CABLE BRACKET	1.92

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

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

**TRINITY HIGHWAY
 PRODUCTS, LLC**

PROJ: CASS-S3_6:1

1:200

Plot Scale -

TRW11NT35

Plotted From -

file: SS-743_TL4_S3_6:1_dwg

File - ...174E_NonSectionMethod_Revision.dgn

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)	4 1/4	4	3 3/4	3 1/2	3 1/4	3	2 3/4	2 1/2	2 1/4	2	1 3/4	1 1/2	1 1/4	1

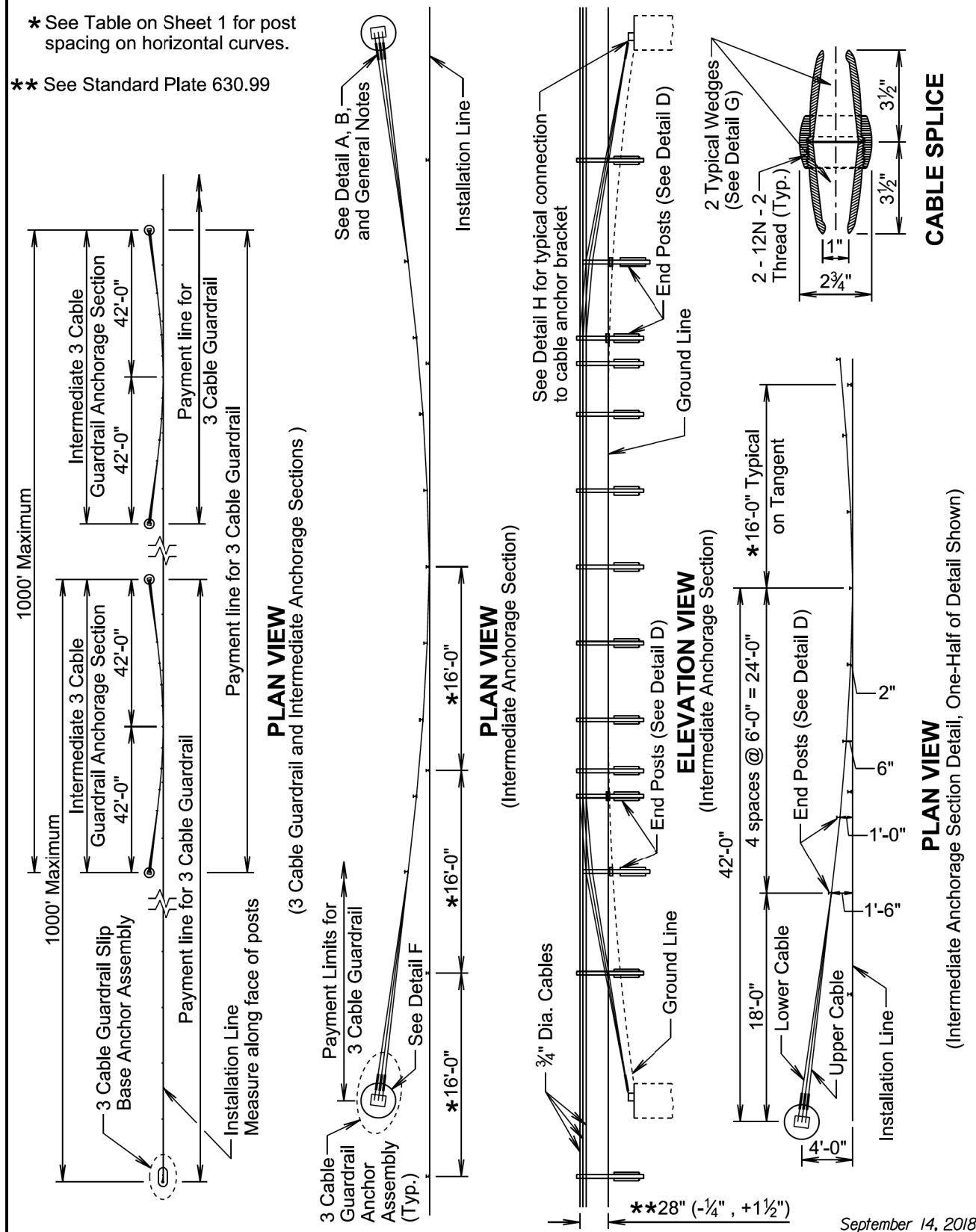
POST SPACING FOR HORIZONTAL CURVES	
Roadway ϕ Curvature	Maximum Post Spacing (Ft)
1° and Less	16
Greater than 1° to 8°	12
Greater than 8° to 13°	8
Greater than 13°	NOT ALLOWED

September 14, 2018

Published Date: 1st Qtr. 2023	S D D O T	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



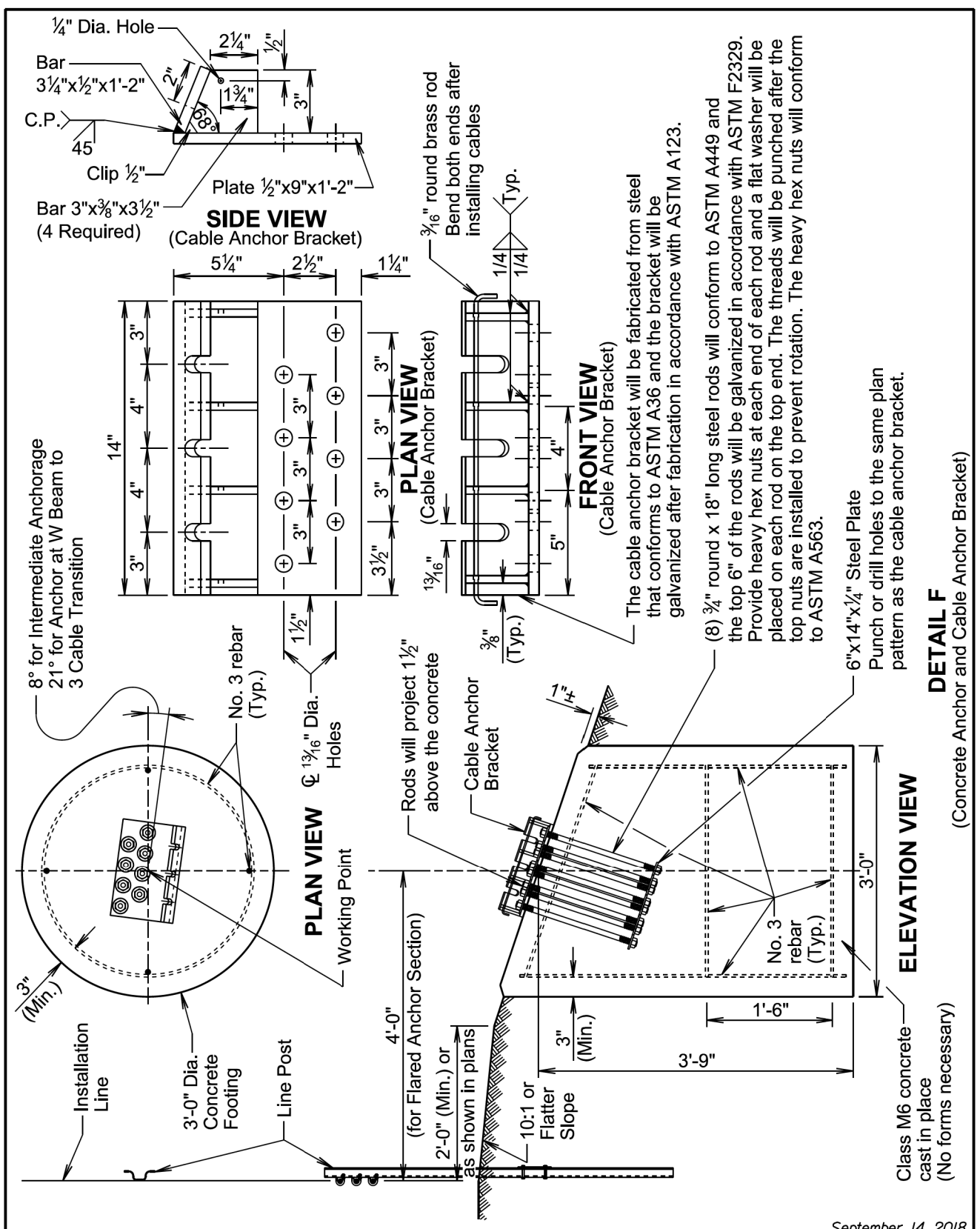
September 14, 2018

Published Date: 1st Qtr. 2023	S D D O T	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER 629.01
			Sheet 2 of 6

Plot Scale - 1:200

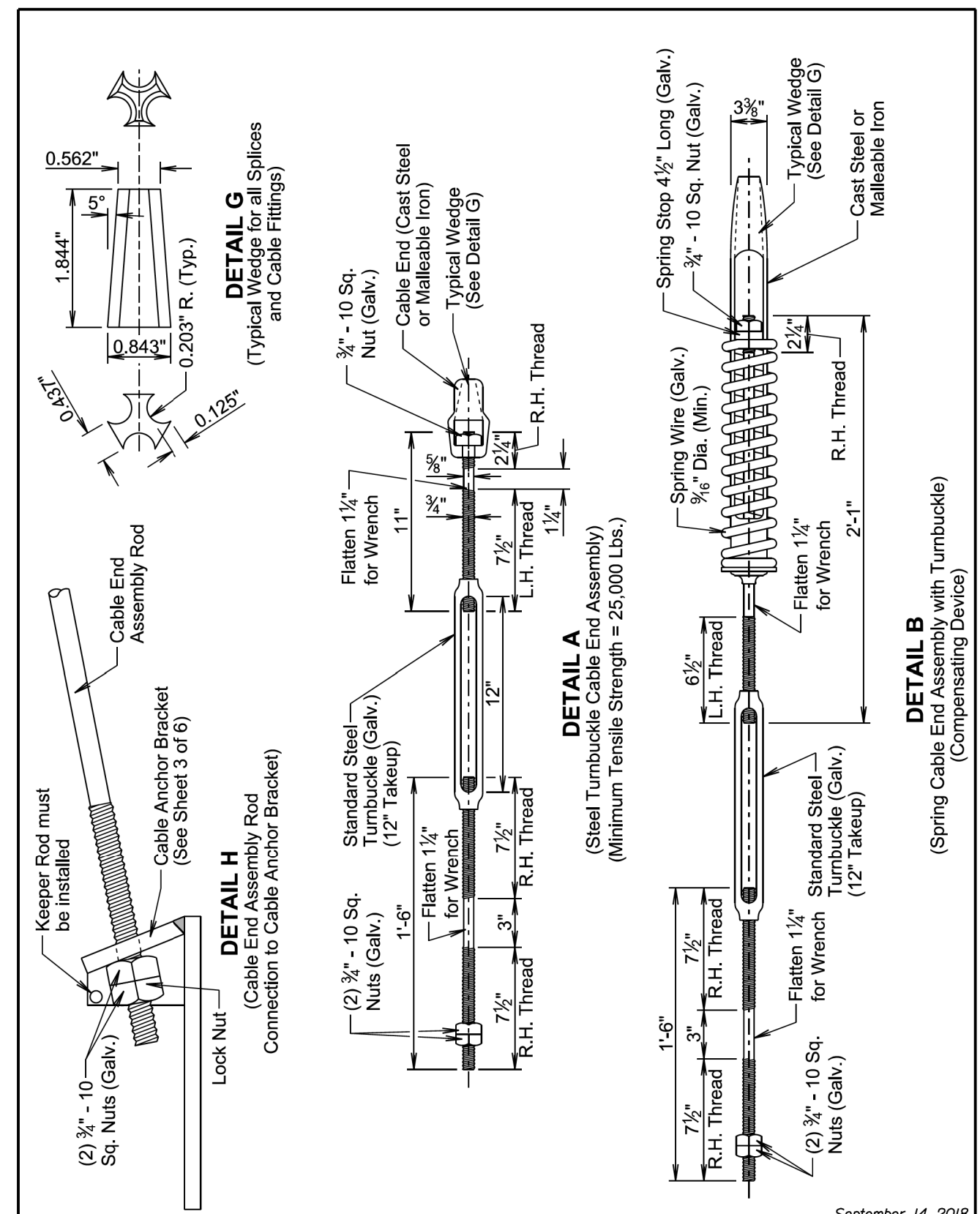
- Plotted From - TRW11NT35

File - ...174E_NonSectionMethod_Revision.dgn



September 14, 2018

Published Date: 1st Qtr. 2023	S D D O T	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER 629.01
			Sheet 3 of 6



September 14, 2018

Published Date: 1st Qtr. 2023	S D D O T	3 CABLE GUARDRAIL (LOW TENSION)	PLATE NUMBER 629.01
			Sheet 4 of 6

Published Date: 1st Qtr. 2023

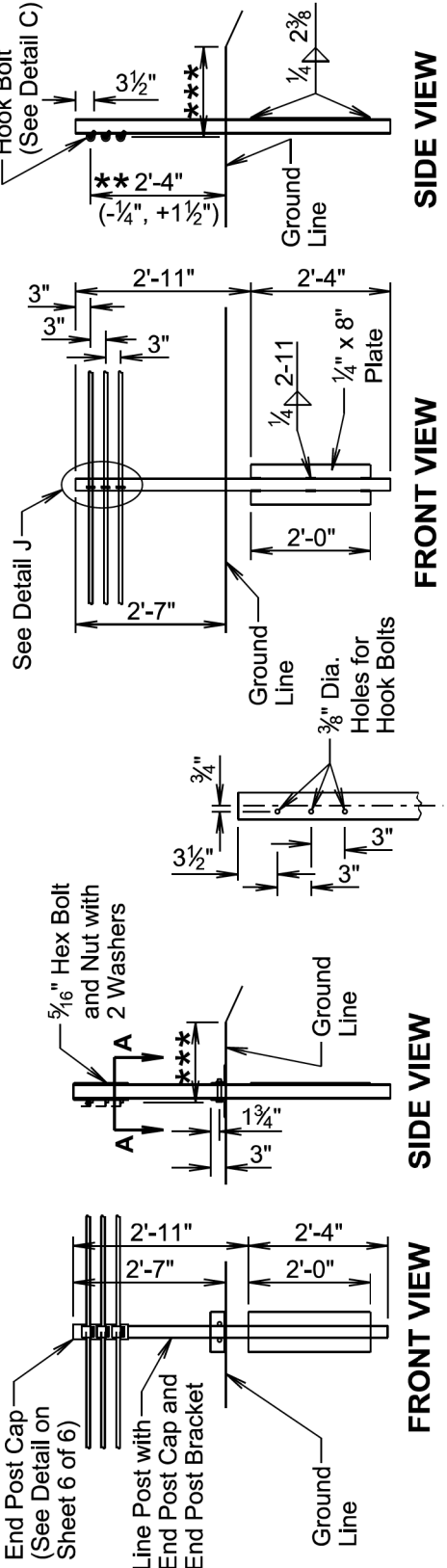
TODDS

**3 CABLE GUARDRAIL
(LOW TENSION)**

PLATE NUMBER
629.01

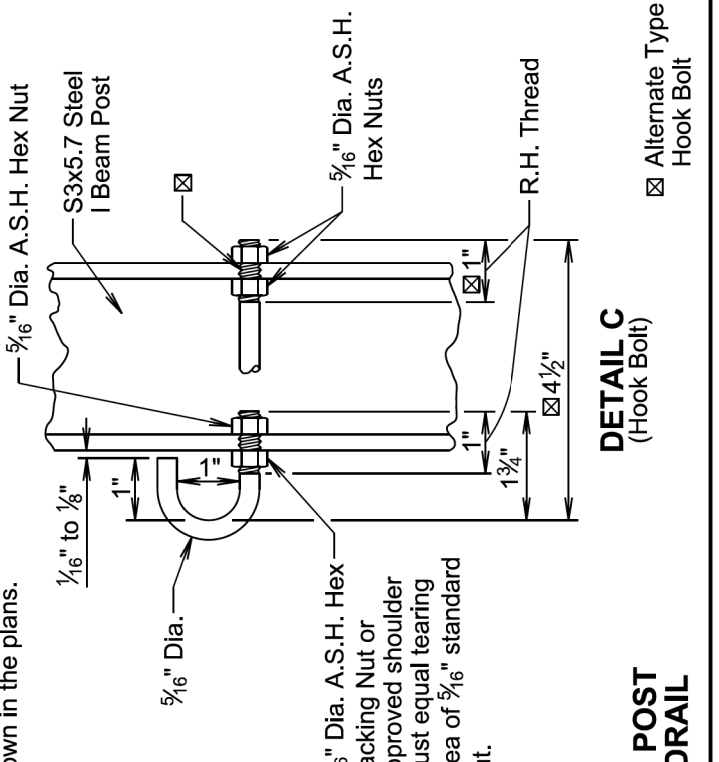
Sheet 5 of 6

September 14, 2018



** See Standard Plate 630.99
*** 2' (Min.) or as shown in the plans.

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.



**S3x5.7 STEEL I BEAM POST
FOR 3 CABLE GUARDRAIL**

☒ Alternate Type
Hook Bolt

Published Date: 1st Qtr. 2023

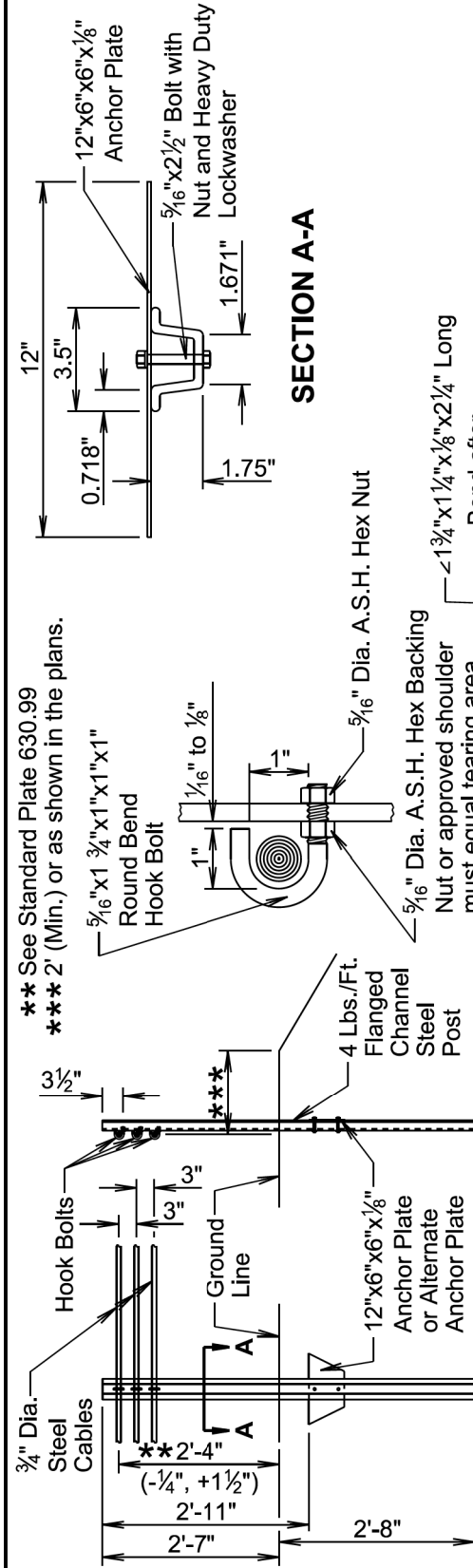
TODDS

**3 CABLE GUARDRAIL
(LOW TENSION)**

PLATE NUMBER
629.01

Sheet 6 of 6

September 14, 2018



** See Standard Plate 630.99
*** 2' (Min.) or as shown in the plans.

1 1/2" x 1 3/4" x 1 1/4" x 1/8" x 2 1/4" Long
Bend after cable is installed

5/16" Dia. A.S.H. Hex Nut or approved shoulder must equal tearing area of 5/16" standard nut.

HOOK BOLT

ANCHOR PLATE

ANCHOR PLATE

ANCHOR PLATE

GENERAL NOTES:

Flanged channel steel posts will be produced from high strength steel in accordance with ASTM A499, Grade 60. Anchor plates will be in conformance with ASTM A709, Grade 36. Bolt will be in conformance with ASTM A307. Nut will be in conformance with ASTM A563, Grade DH. Finish for the post and anchor plate will be a baked on high quality dark green enamel. Alternate anchor plate may be unfinished.

Published Date: 1st Qtr. 2023

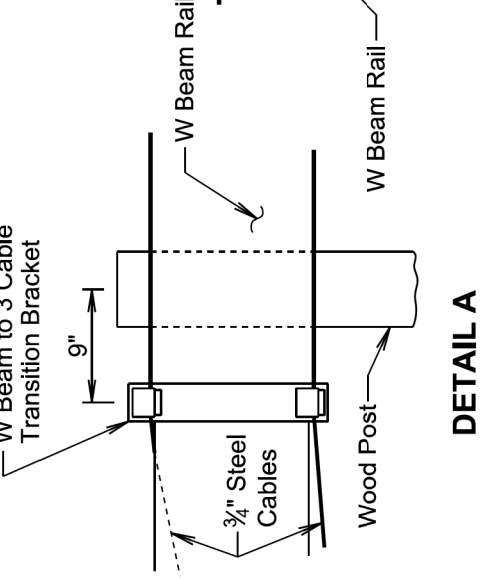
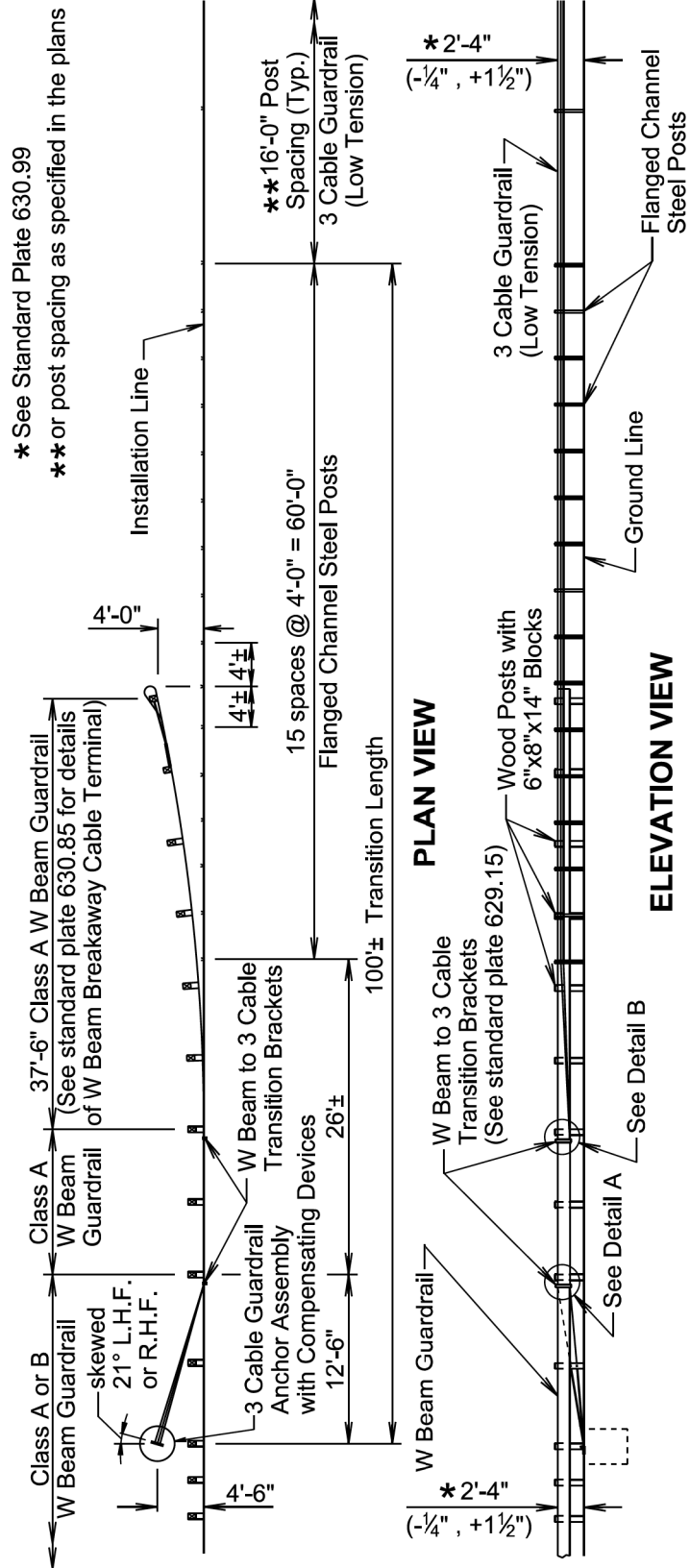
TO DO'S

W BEAM TO 3 CABLE TRANSITION

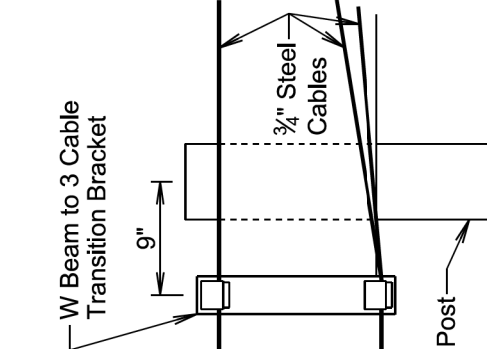
PLATE NUMBER
629.05

Sheet 1 of 1

September 14, 2018



DETAIL A



DETAIL B

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.

Published Date: 1st Qtr. 2023

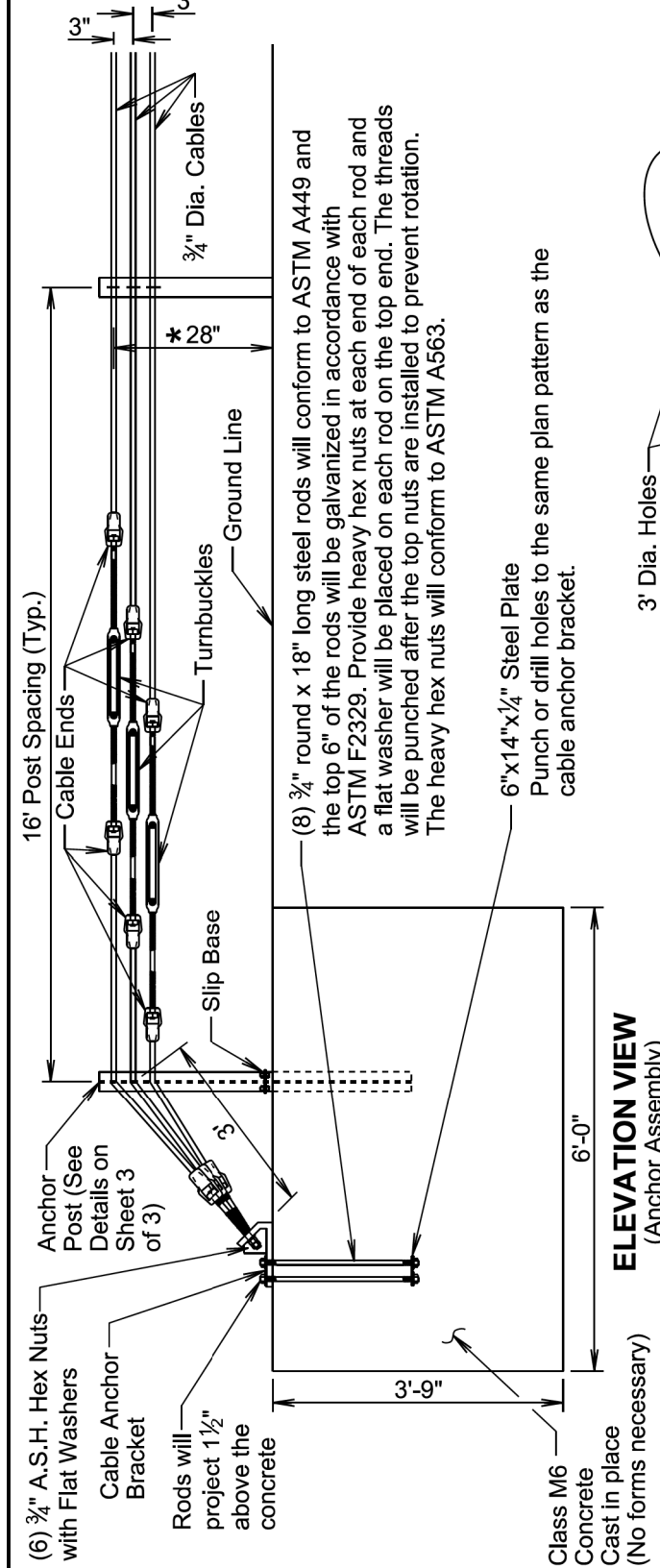
TO DO'S

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

PLATE NUMBER
629.10

Sheet 1 of 3

September 14, 2018



ELEVATION VIEW (Anchor Assembly)

PLAN VIEW (Anchor Assembly)

(6) 3/4" A.S.H. Hex Nuts with Flat Washers

Cable Anchor Bracket

Rods will project 1 1/2" above the concrete

Class M6 Concrete Cast in place (No forms necessary)

6'-0"

3'-0"

3' Dia. Holes

3' Dia. Cables

* 2'-4"

3/4" Dia. Cables

Turnbuckles

Ground Line

Anchor Post (See Details on Sheet 3 of 3)

Slip Base

(8) 3/4" round x 18" long steel rods will conform to ASTM A449 and the top 6" of the rods will be galvanized in accordance with ASTM F2329. Provide heavy hex nuts at each end of each rod and a flat washer will be placed on each rod on the top end. The threads will be punched after the top nuts are installed to prevent rotation. The heavy hex nuts will conform to ASTM A563.

6"x14"x1/4" Steel Plate

Punch or drill holes to the same plan pattern as the cable anchor bracket.

3' Dia. Holes

3'-0"

Remove soil prior to placement of concrete

Remove soil

3' Dia. Holes

Bottom Cable

Top Cable

Face of cables and center of anchor

Center of post is 3" back from face of cables

27"

3'-0"

3'-0"

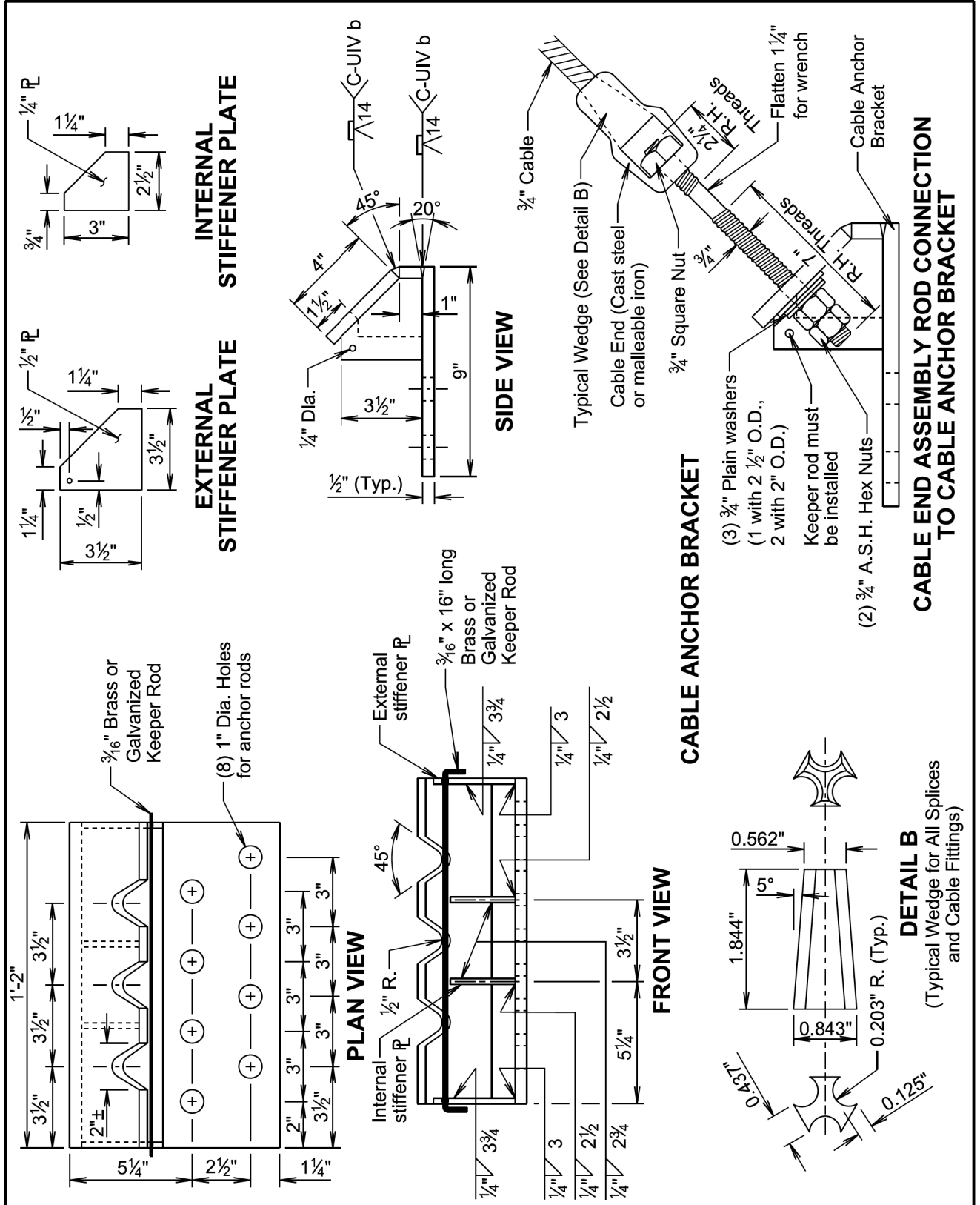
3' Dia. Holes

Remove soil prior to placement of concrete

ANCHOR CONSTRUCTION NOTES:

Auger two 3' diameter by 3'-9" deep holes tangent to each other. Clean out the top 6 inches of soil between the holes. Place concrete in holes with anchor bolts and slip base stub post in place. For informational purposes the neat line concrete volume of the anchor is 1.9 cubic yards.

ISOMETRIC VIEW

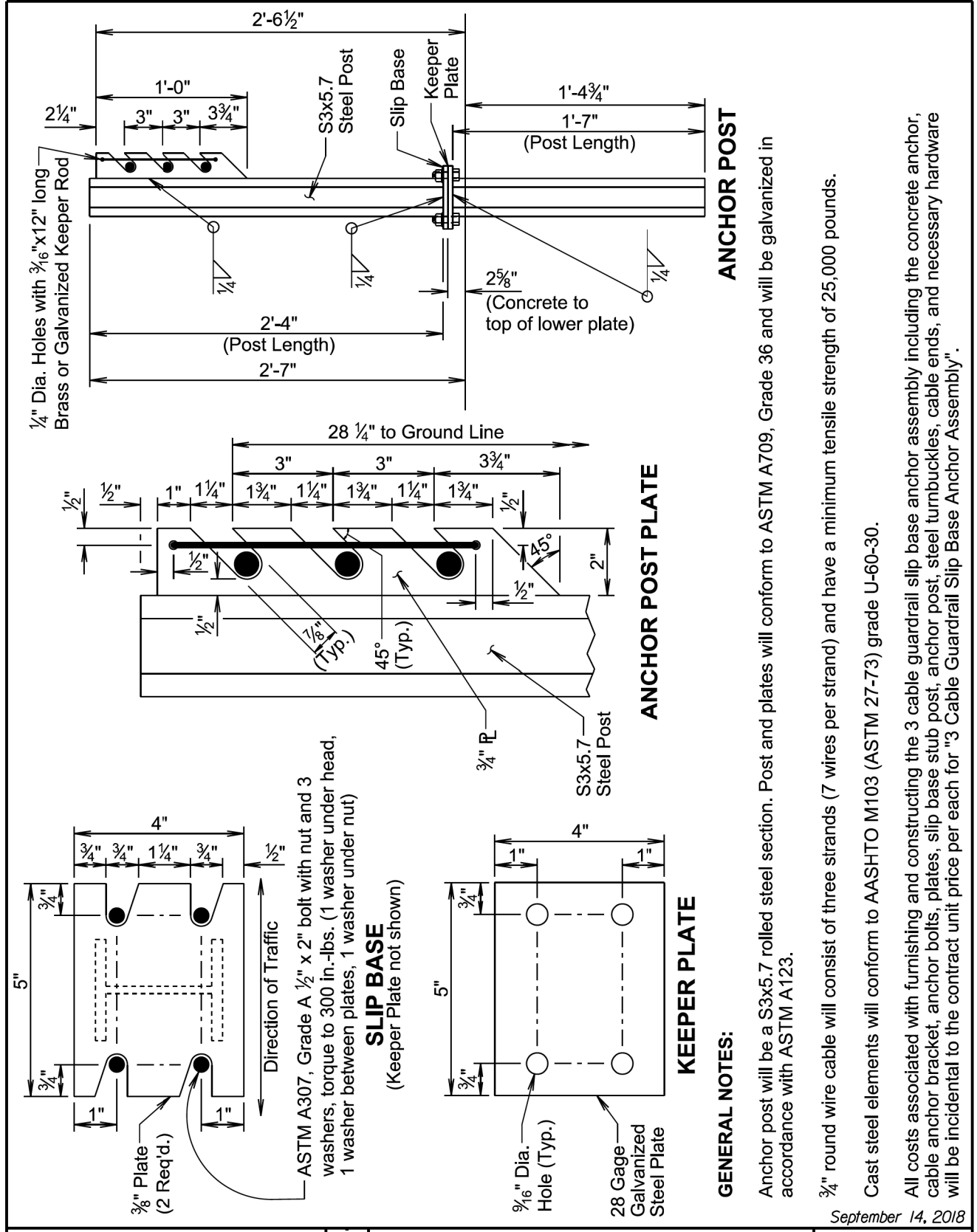


Published Date: 1st Qtr. 2023

TODDS

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

September 14, 2018
PLATE NUMBER 629.10
Sheet 2 of 3



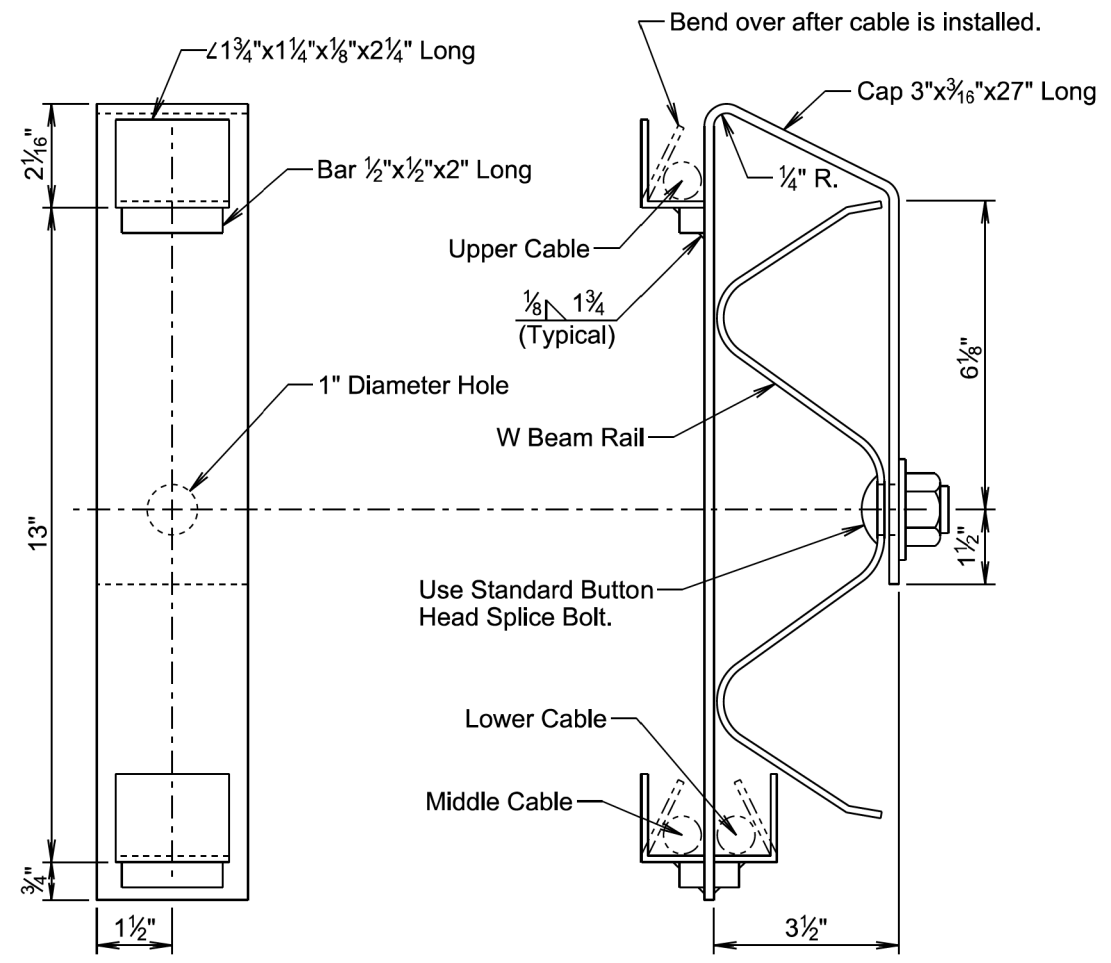
Published Date: 1st Qtr. 2023

TODDS

3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY

September 14, 2018
PLATE NUMBER 629.10
Sheet 3 of 3

Plot Scale - 1:200



ELEVATION VIEW
(Transition Bracket)

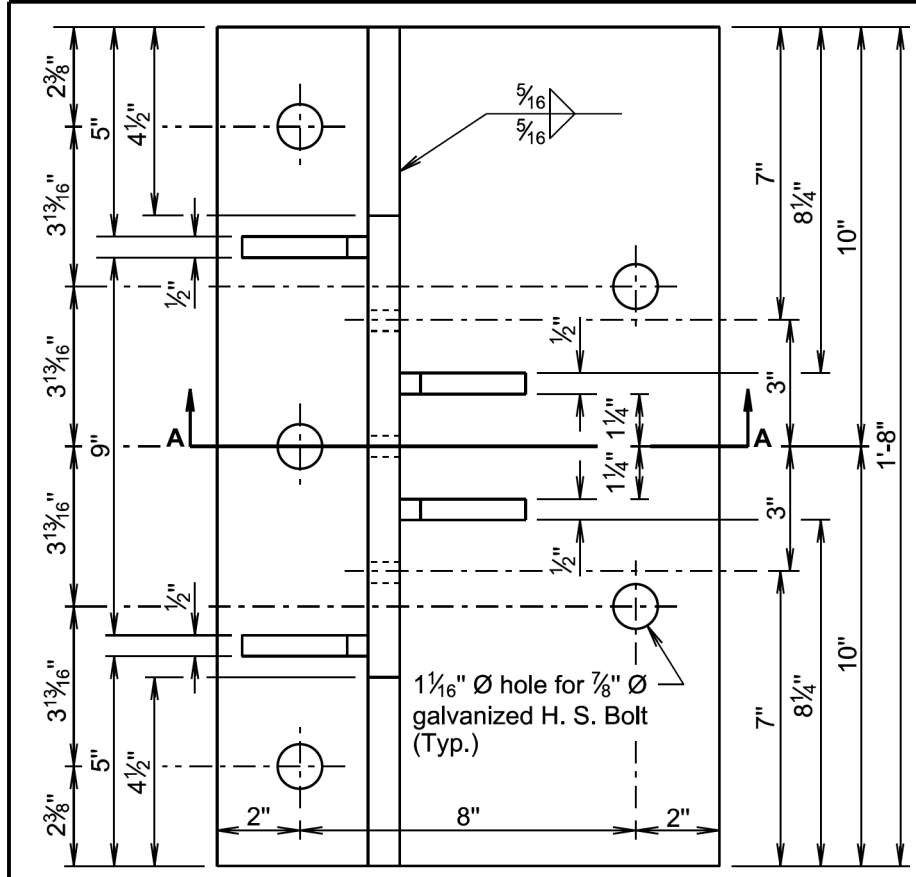
END VIEW
(W Beam Rail and Transition Bracket)

GENERAL NOTES:

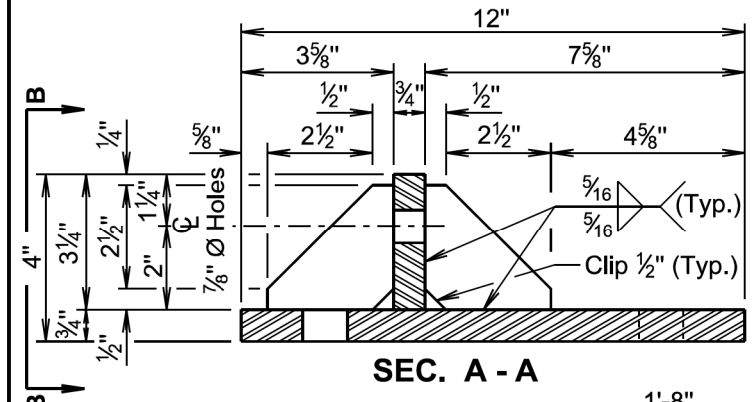
Steel used in the fabrication of the bracket will conform to ASTM A36 and the bracket will be galvanized after fabrication in accordance with ASTM A123.

September 14, 2018

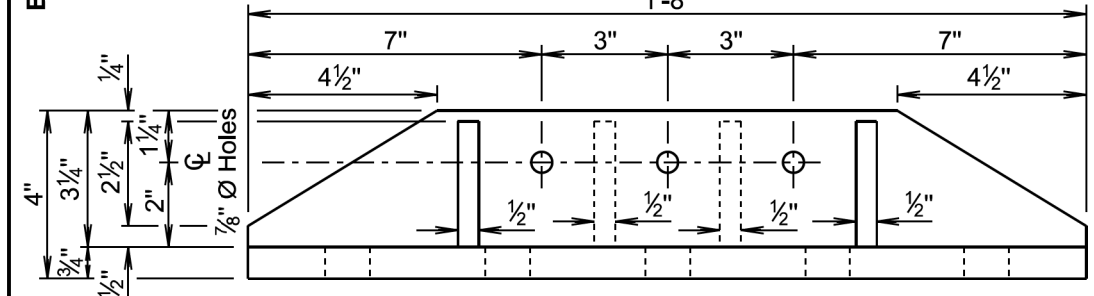
S D D O T	W BEAM TO 3 CABLE TRANSITION BRACKET	PLATE NUMBER 629.15
	Published Date: 1st Qtr. 2023	Sheet 1 of 1



PLAN VIEW



SEC. A - A



VIEW B - B

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.

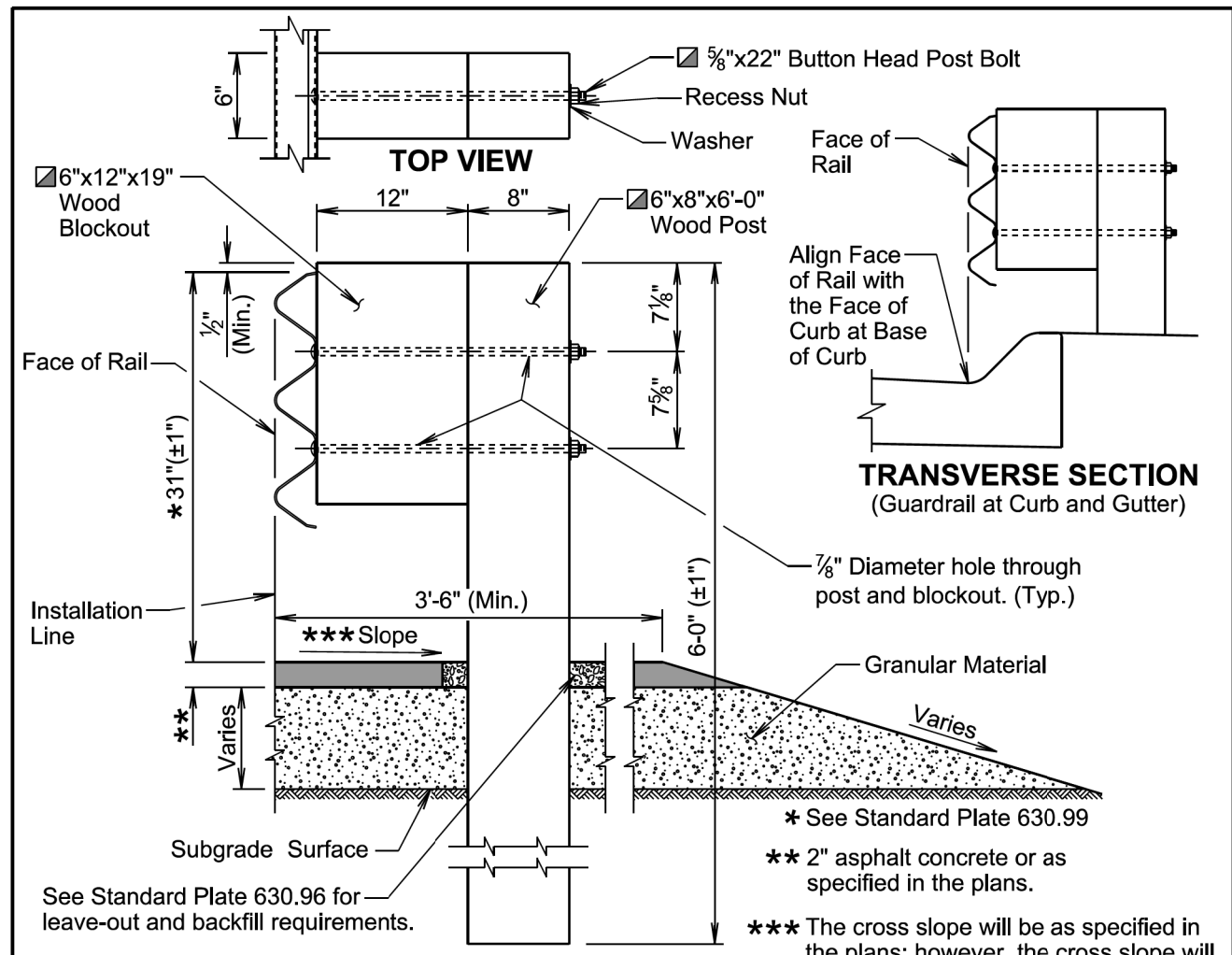
September 14, 2018

S D D O T	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER 629.30
	Published Date: 1st Qtr. 2023	Sheet 1 of 1

- Plotted From - TRW11NT35

File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



GENERAL NOTES: TRANSVERSE SECTION

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

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

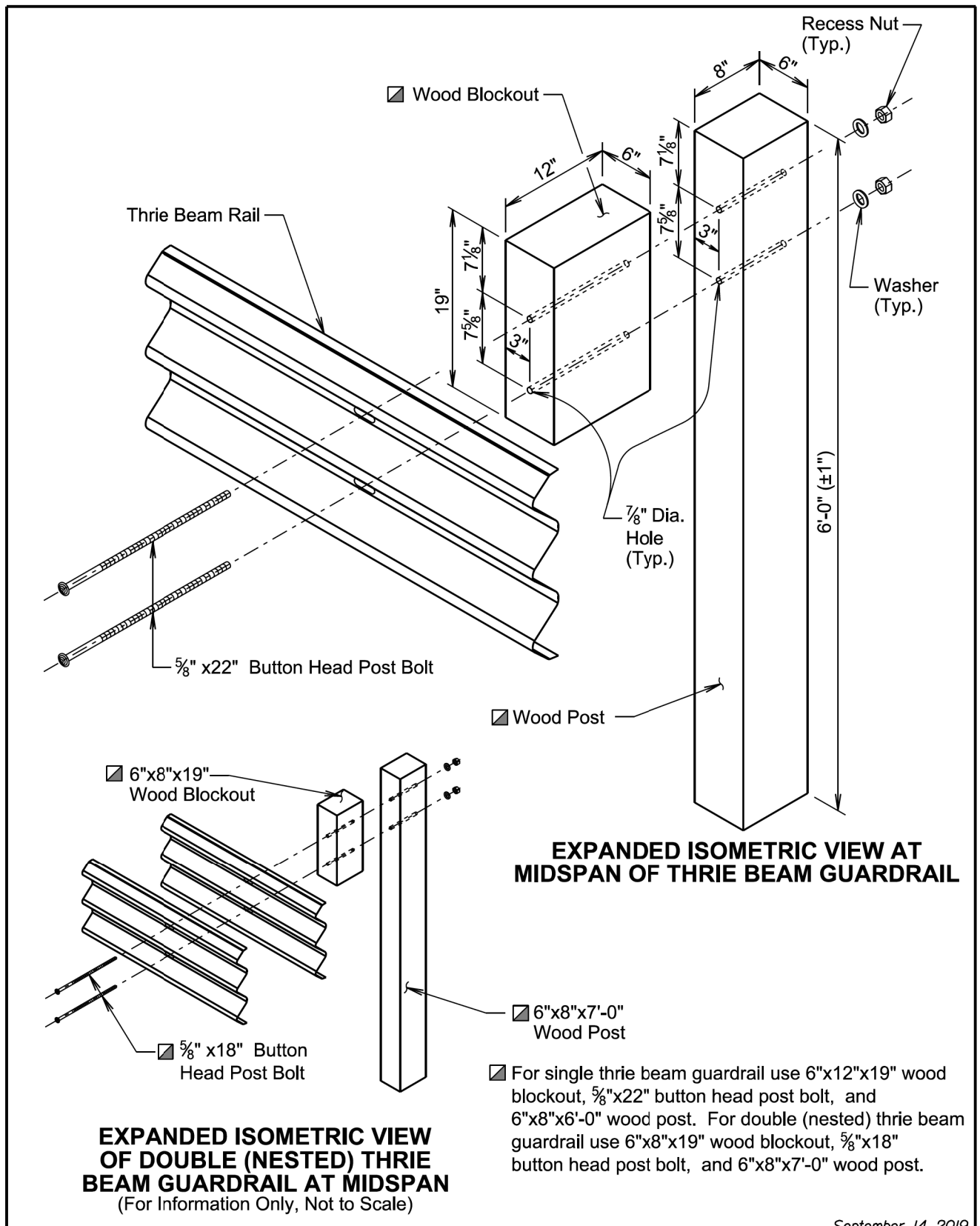
Topsoil is not shown in the transverse section drawing.

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

Slots in the rails will 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 will be smooth and free of burrs or notches.

The top of post and top of block will have a true square cut. The top of block will be a maximum of $\pm\frac{1}{2}$ inch from the top of the post.

September 14, 2019



September 14, 2019

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

☑ For single thrie beam guardrail use 6"x12"x19" wood blockout, 5/8"x22" button head post bolt, and 6"x8"x6'-0" wood post. For double (nested) thrie beam guardrail use 6"x8"x19" wood blockout, 5/8"x18" button head post bolt, and 6"x8"x7'-0" wood post.

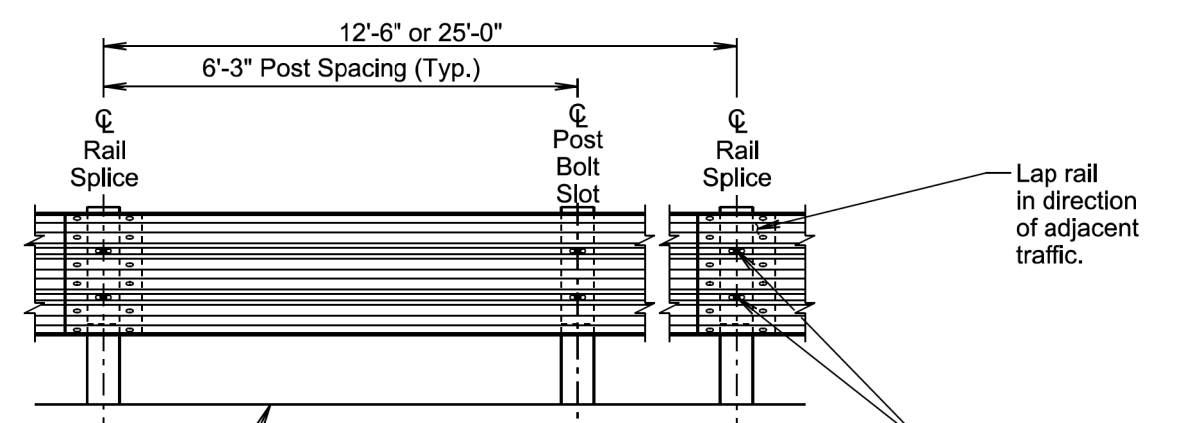
- Plotted From - TRW11NT35

File - ...174E_NonSectionMethod_Revision.dgn

SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
		Sheet 1 of 5
Published Date: 1st Qtr. 2023		

SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
		Sheet 2 of 5
Published Date: 1st Qtr. 2023		

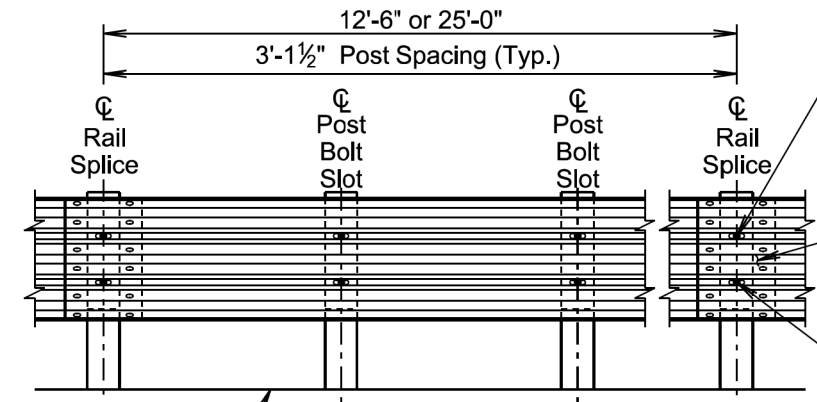
Plot Scale - 1:200



ELEVATION VIEW
(6'-3" Post Spacing)

Lap rail in direction of adjacent traffic.

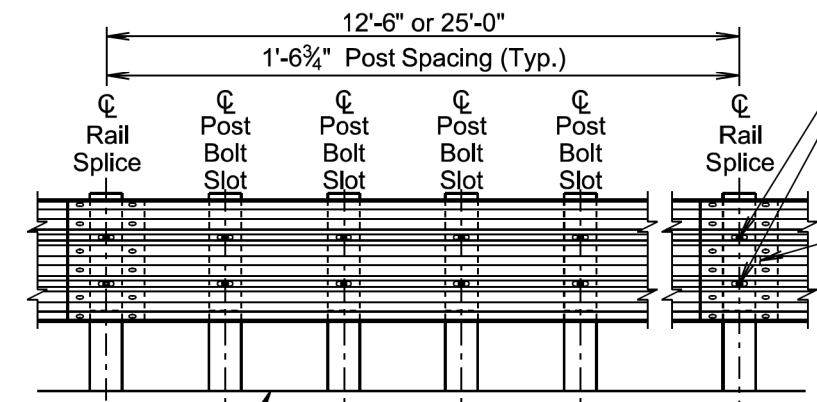
The post bolt should be placed in the center (horizontally and vertically) of the slot. (Typ.)



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

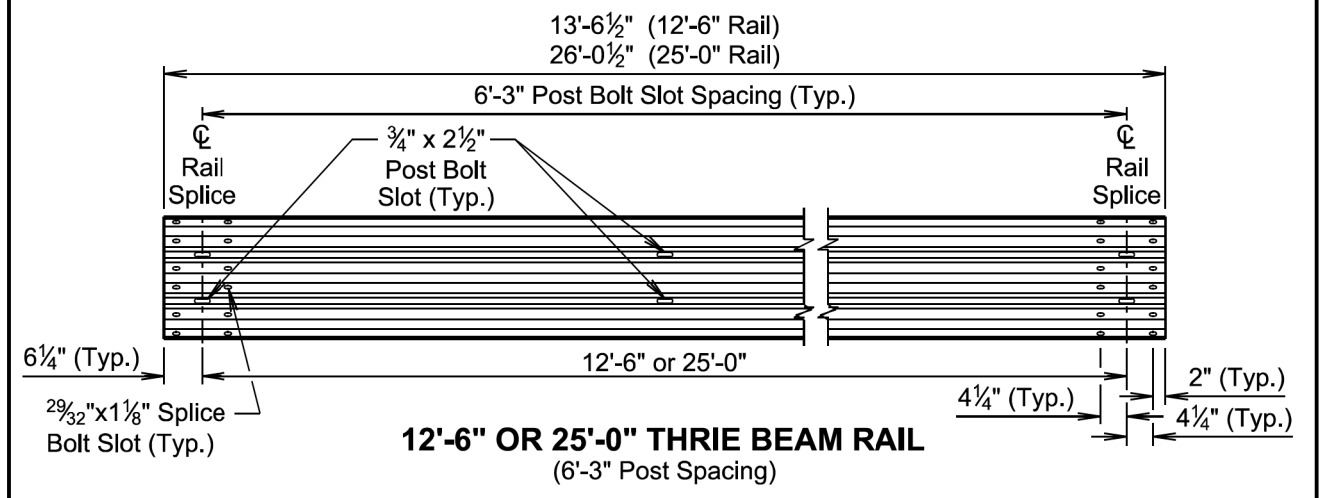
Lap rail in direction of adjacent traffic.

The post bolt should be placed in the center (horizontally and vertically) of the slot. (Typ.)

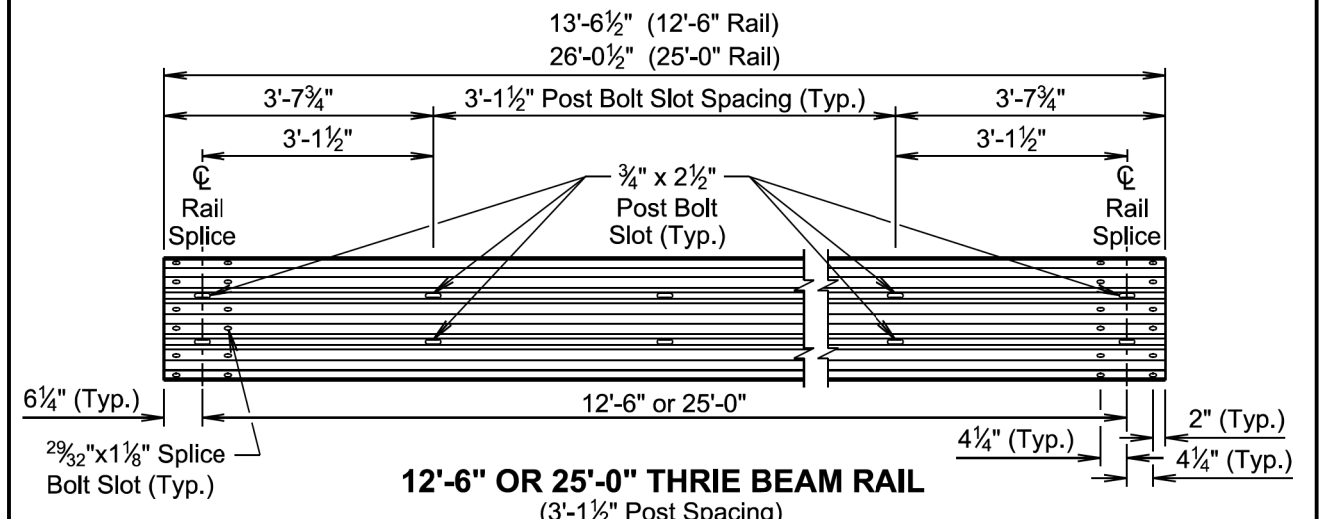


ELEVATION VIEW
(1'-6 3/4" Post Spacing)

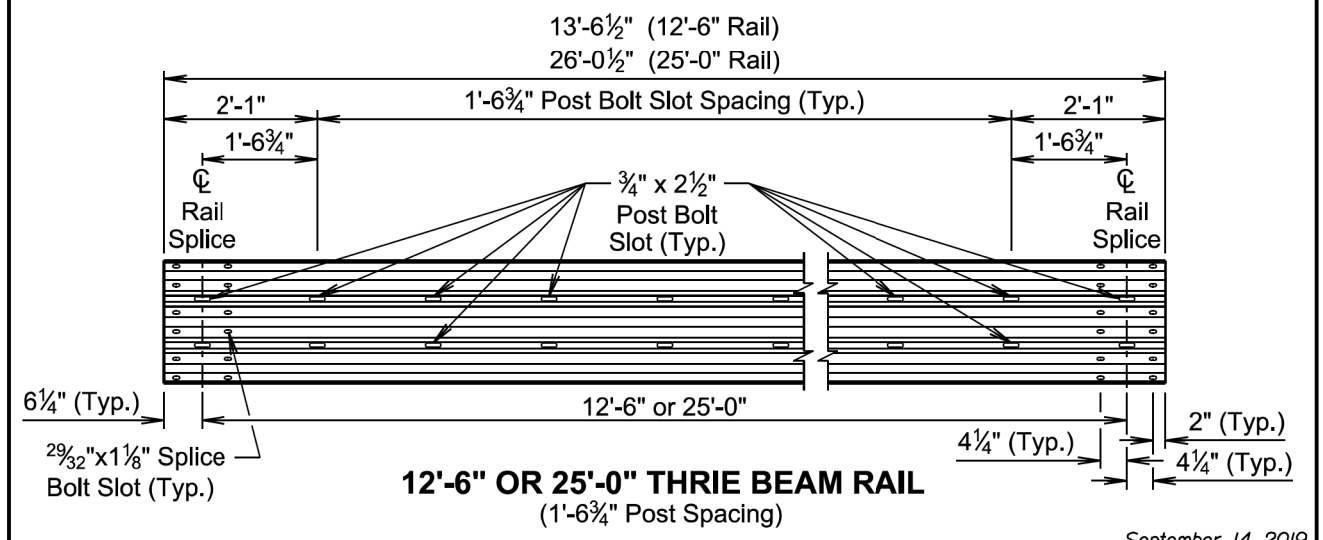
Lap rail in direction of adjacent traffic.



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



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



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

September 14, 2019

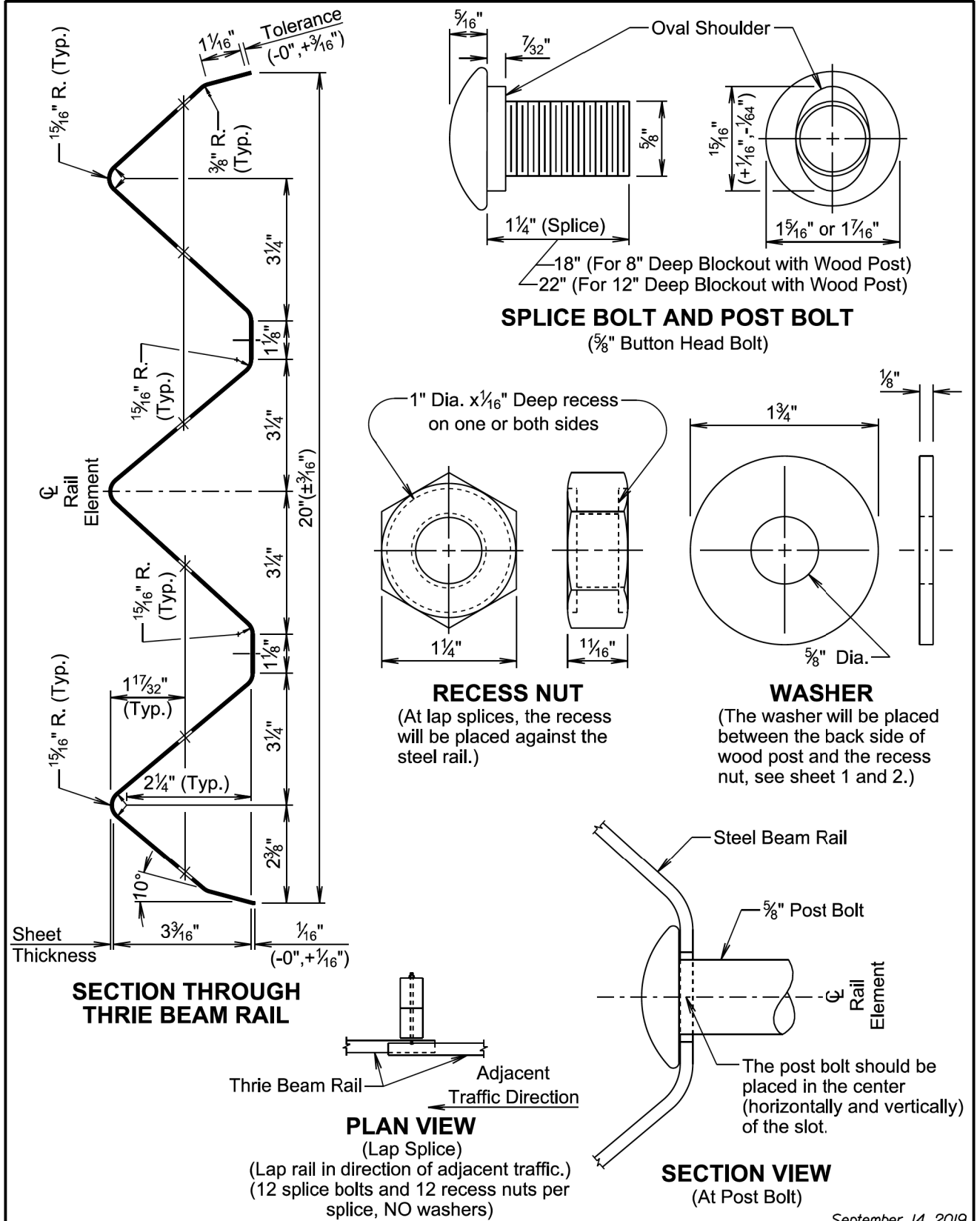
September 14, 2019

SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
	Published Date: 1st Qtr. 2023	Sheet 3 of 5

SDDOT	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
	Published Date: 1st Qtr. 2023	Sheet 4 of 5

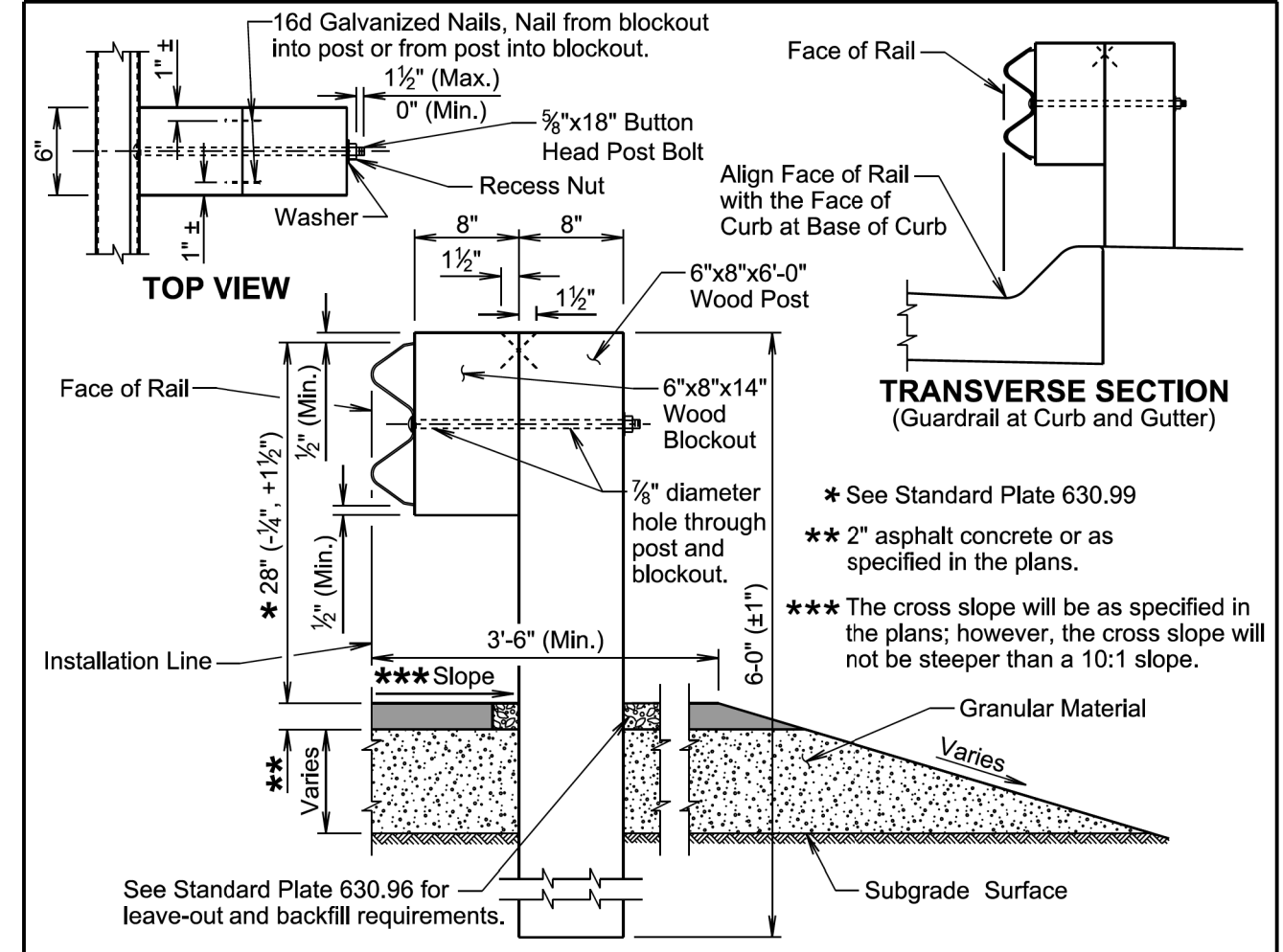
File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



September 14, 2019

Published Date: 1st Qtr. 2023	S D D O T	THRIE BEAM GUARDRAIL	PLATE NUMBER 630.01
			Sheet 5 of 5



TRANSVERSE SECTION

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

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will 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 will 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 will be compatible with the total length of rail per site as shown in the plans.

Slots in the rails will 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 will be smooth and free of burrs or notches.

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

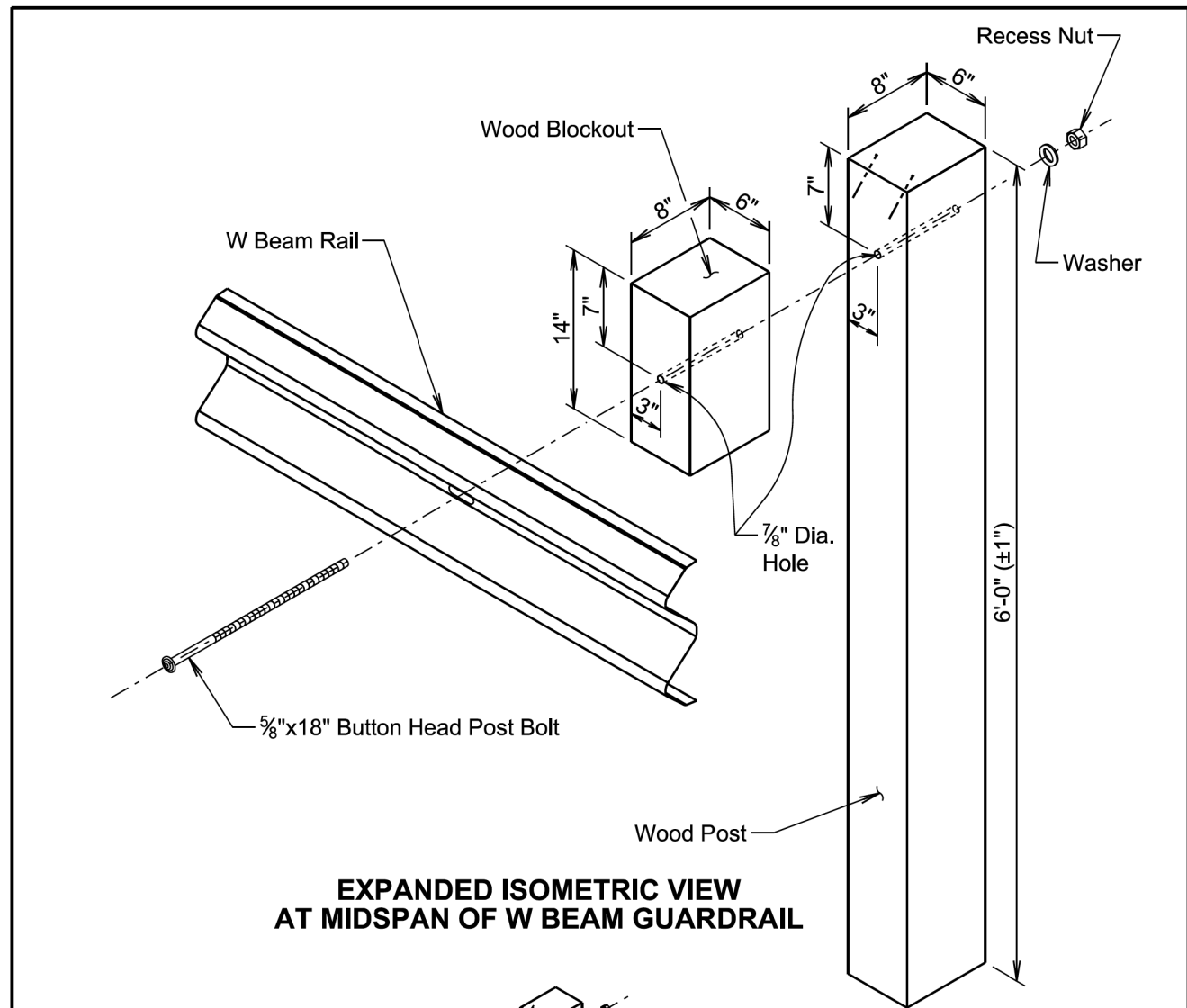
September 14, 2019

Published Date: 1st Qtr. 2023	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 1 of 5

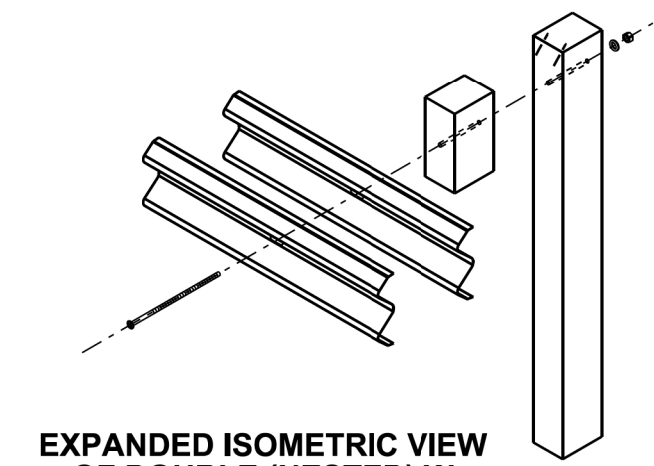
Plotted From - TRW11NT35

File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



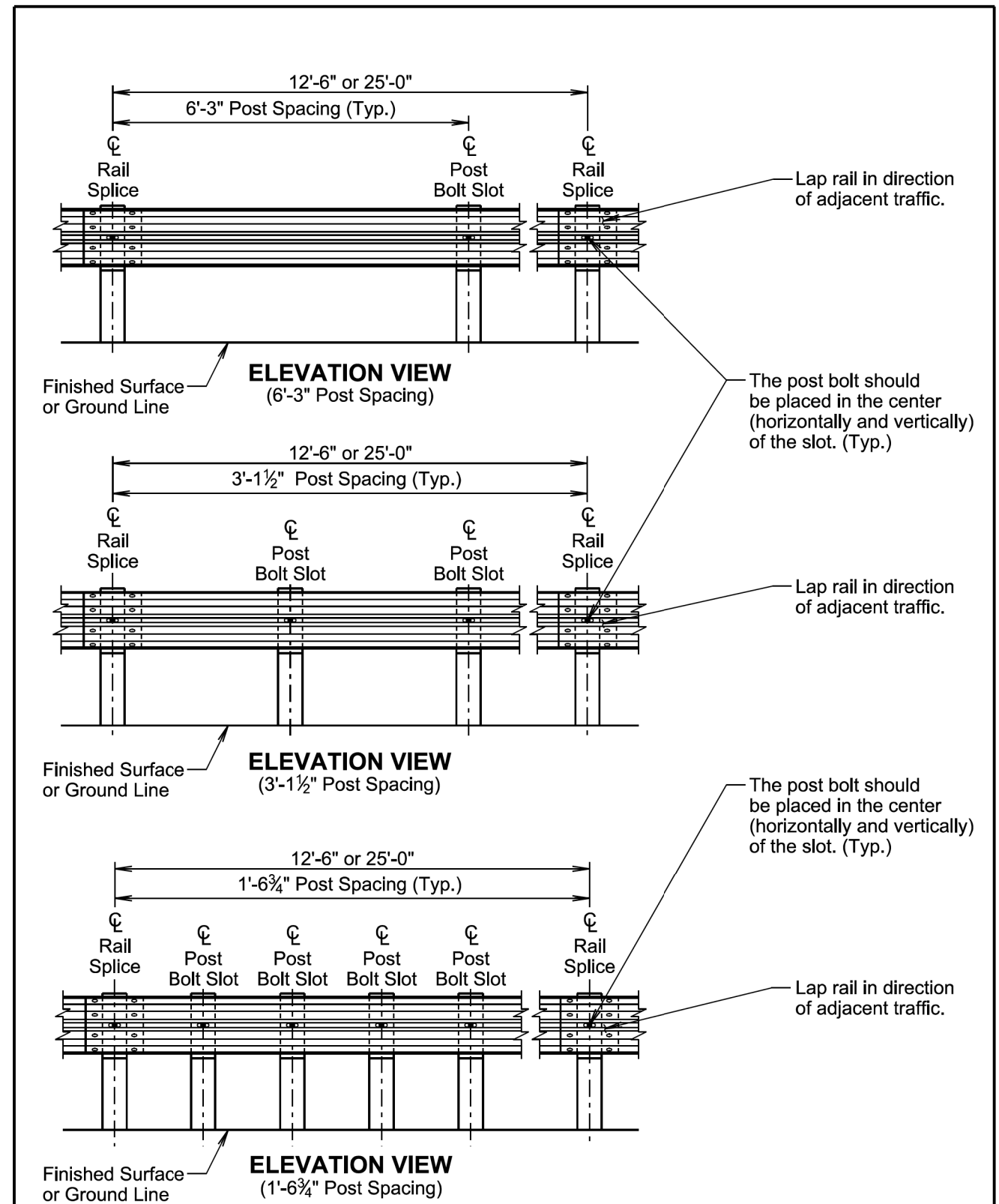
EXPANDED ISOMETRIC VIEW AT MIDSPAN OF W BEAM GUARDRAIL



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

September 14, 2019

<i>Published Date: 1st Qtr. 2023</i>	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 2 of 5



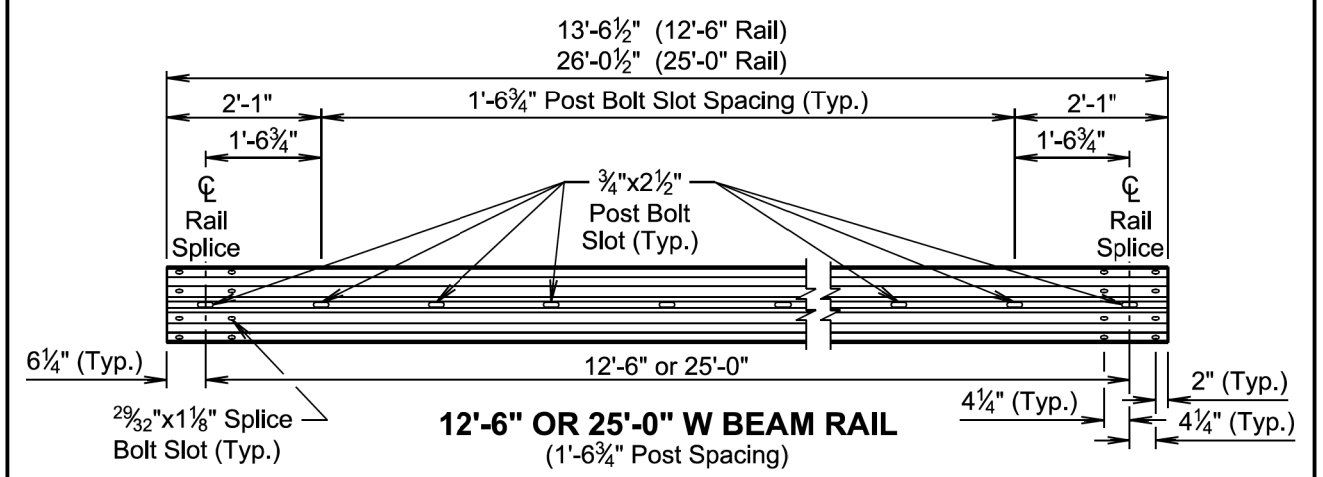
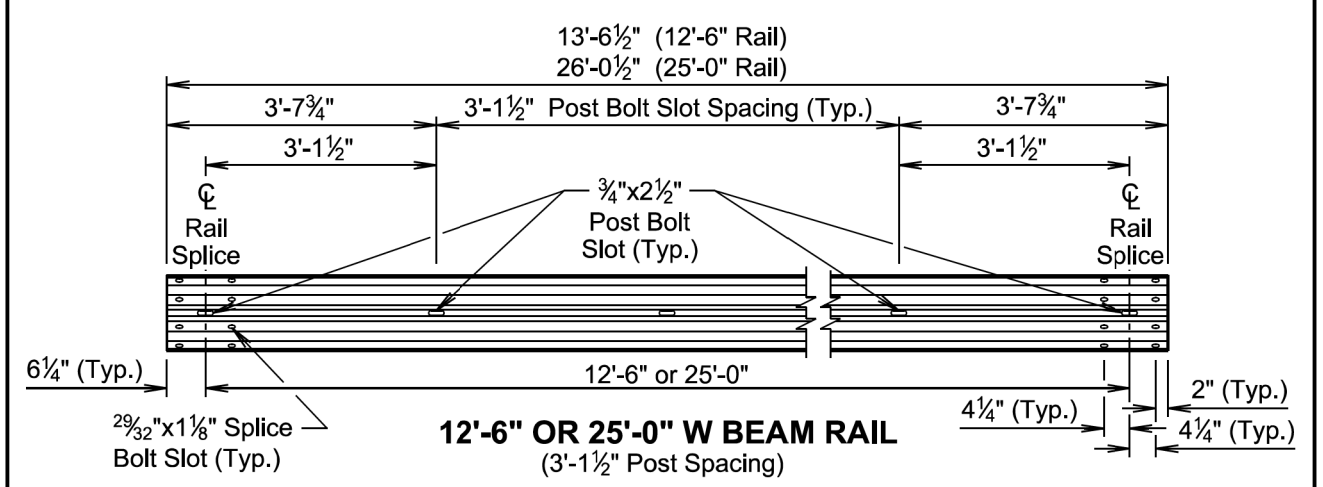
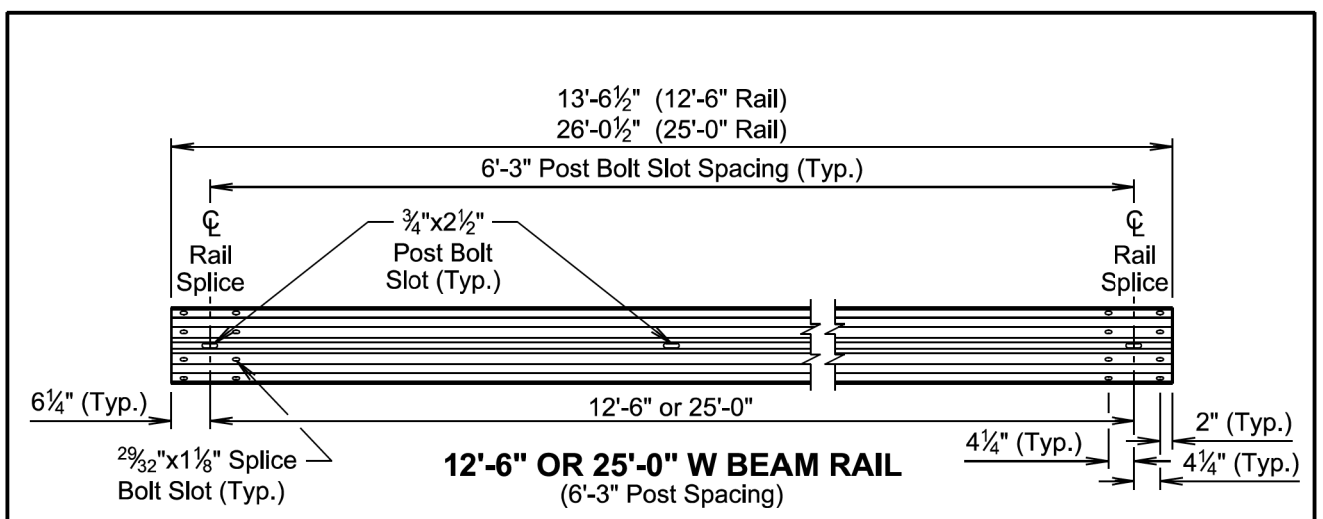
September 14, 2019

<i>Published Date: 1st Qtr. 2023</i>	S D D O T	W BEAM GUARDRAIL	PLATE NUMBER 630.10
			Sheet 3 of 5

- Plotted From - TRW11NT35

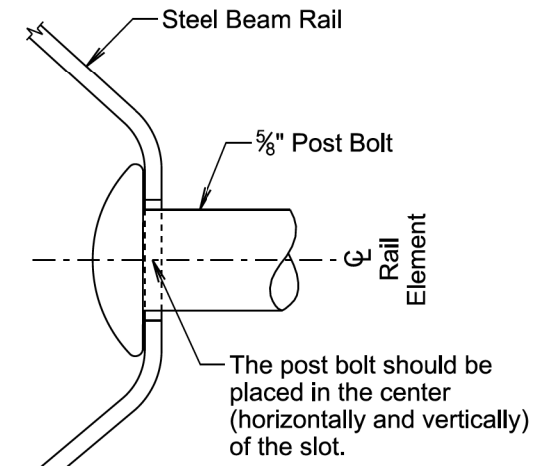
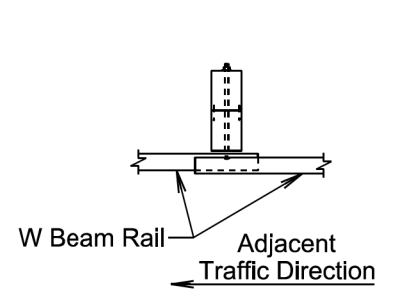
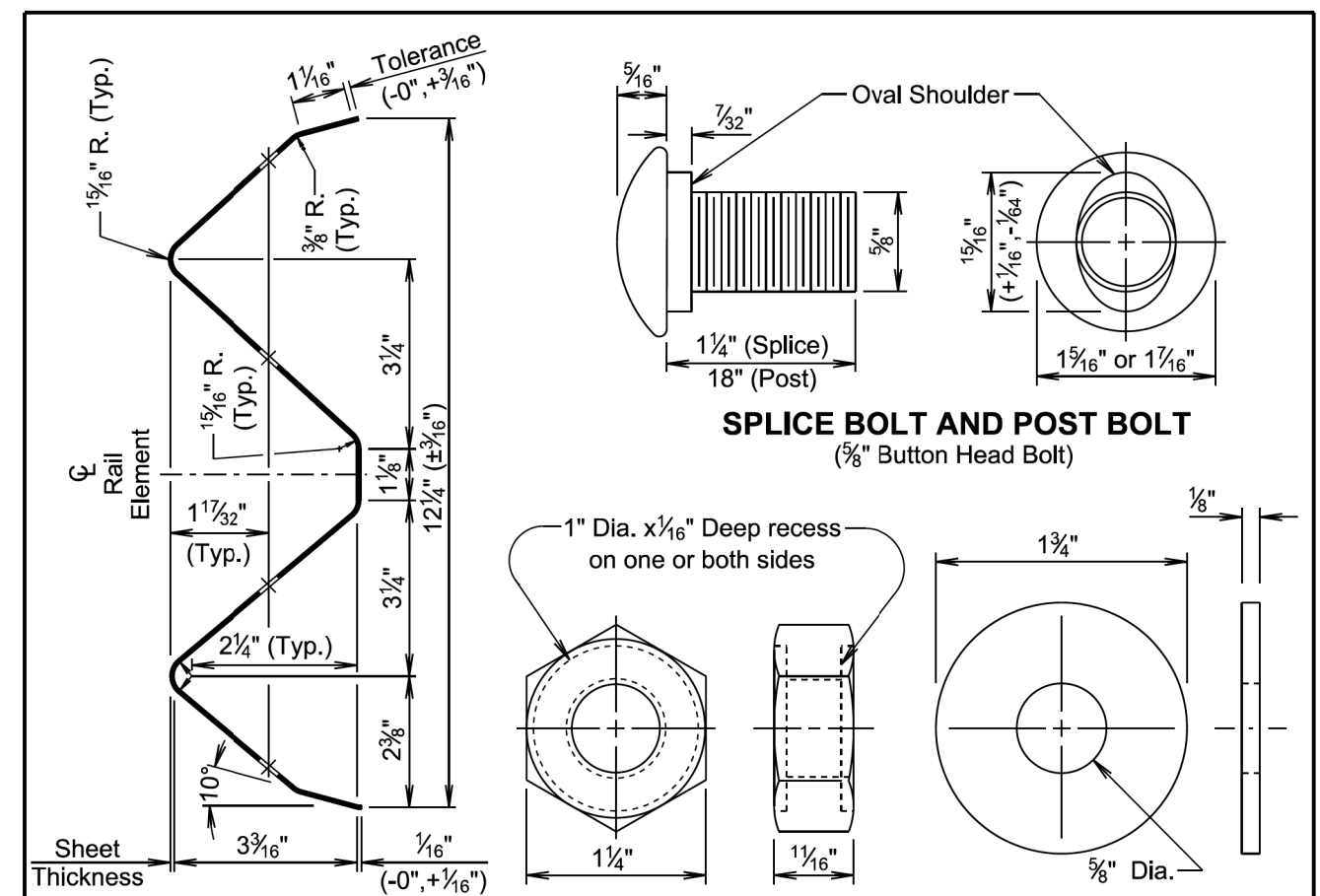
File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



September 14, 2019

SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
		Sheet 4 of 5
		Published Date: 1st Qtr. 2023



September 14, 2019

SDDOT	W BEAM GUARDRAIL	PLATE NUMBER 630.10
		Sheet 5 of 5
		Published Date: 1st Qtr. 2023

File - ...174E_NonSectionMethod_Revision.dgn

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'-1½"
3	Single	6"x12"x14"	Wood	6"x8"x6'-0"	Wood	1'-6¾"
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 will be the same type used elsewhere on the project or will be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete will conform to the Specifications for "Asphalt Concrete Composite".

Granular material will be the same type used elsewhere on the project or will be as specified in the plans. If granular material type is not specified in the plans, the material will conform to the Specifications for "Base Course". The granular material will 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 will be Type 1 and Class A (12 Ga.) unless specified otherwise in the plans.

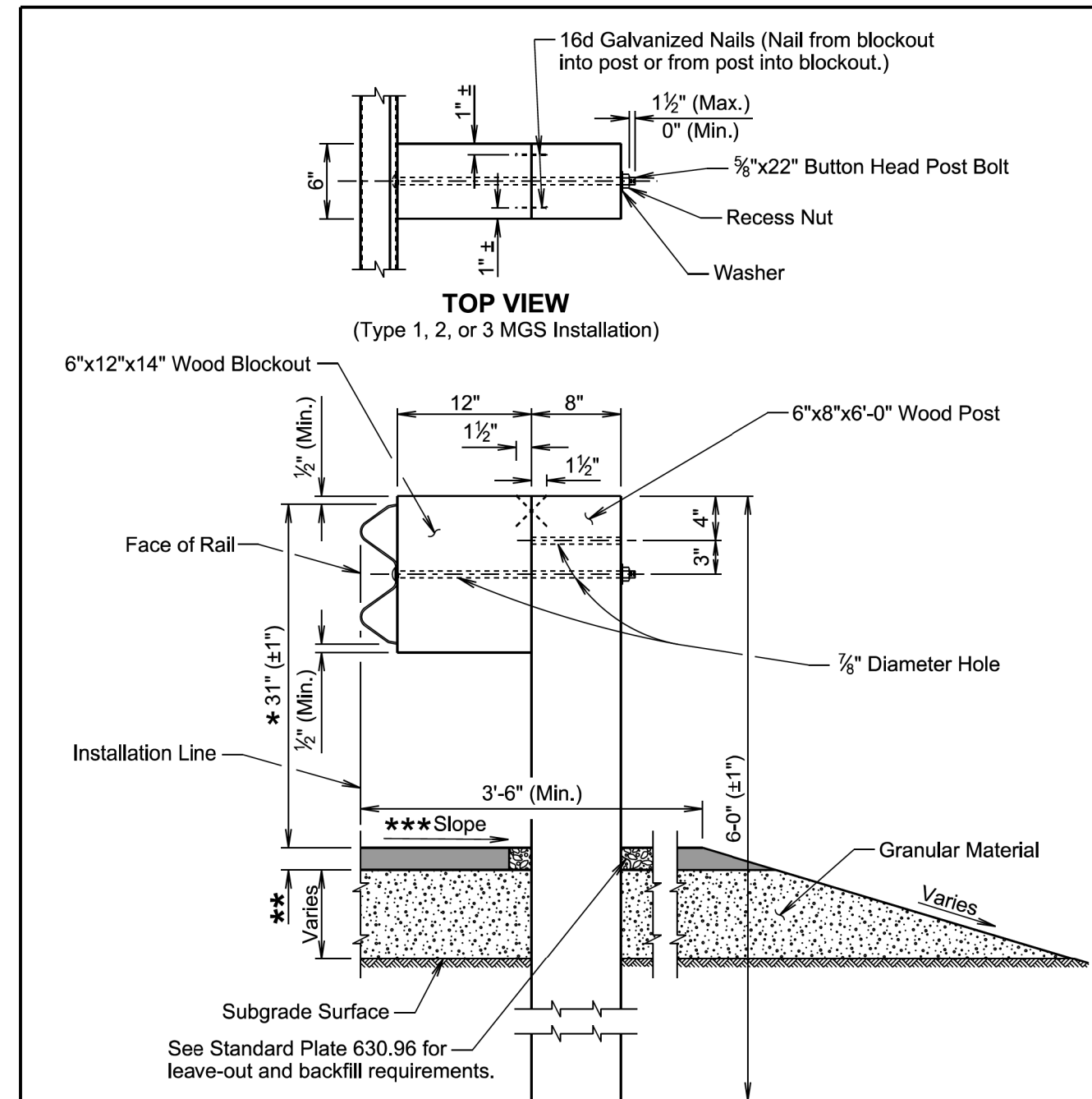
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used will be compatible with the total length of rail per site as shown in the plans.

Slots in the rails will 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 will 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 will be incidental to the contract unit price per foot for the respective MGS contract item.

September 14, 2019

Published Date: 1st Qtr. 2023	S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 1 of 6


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

* See Standard Plate 630.99

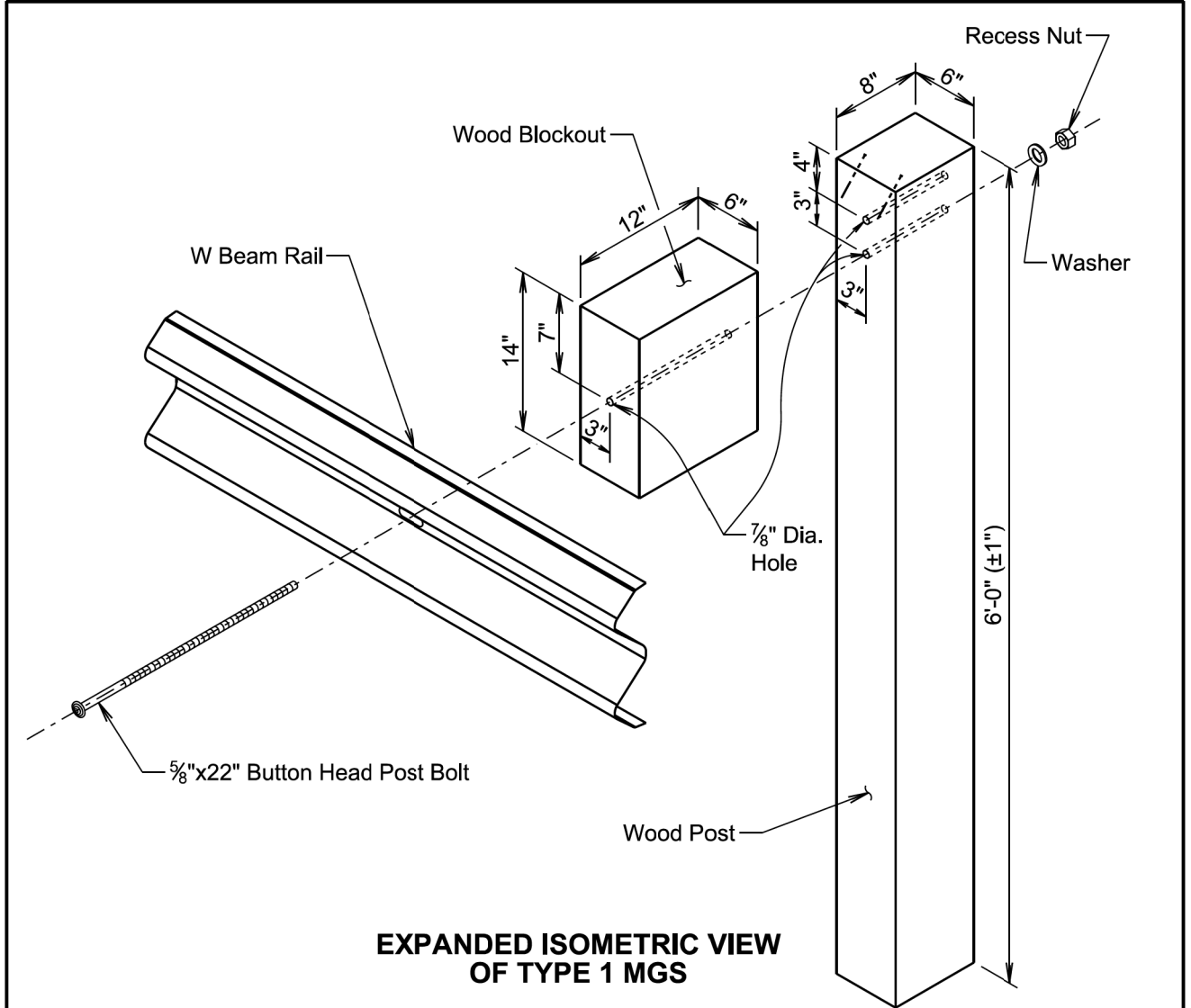
** 2" asphalt concrete or as specified in the plans.

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

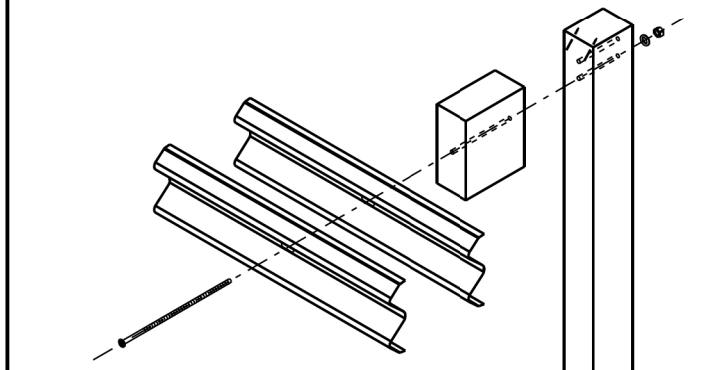
September 14, 2019

Published Date: 1st Qtr. 2023	S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
			Sheet 2 of 6

Plot Scale - 1:200



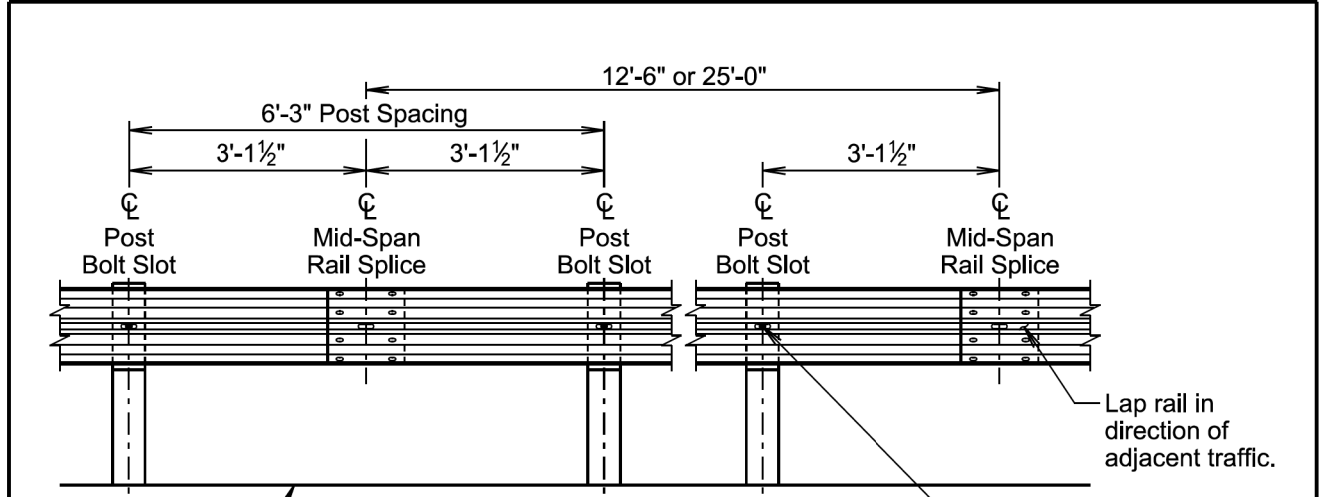
EXPANDED ISOMETRIC VIEW OF TYPE 1 MGS



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

September 14, 2019

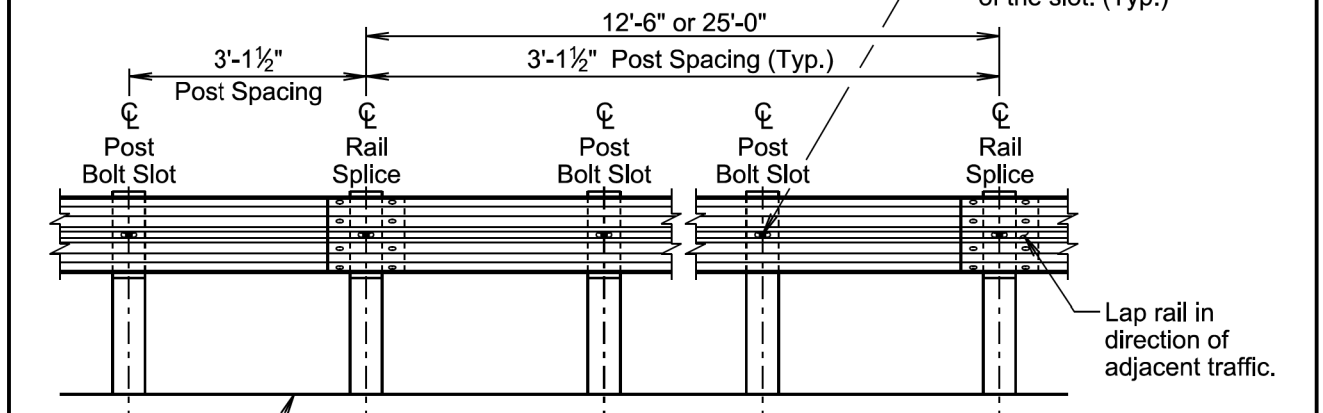
S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 3 of 6
		Published Date: 1st Qtr. 2023



ELEVATION VIEW
(6'-3" Post Spacing)

Finished Surface or Ground Line

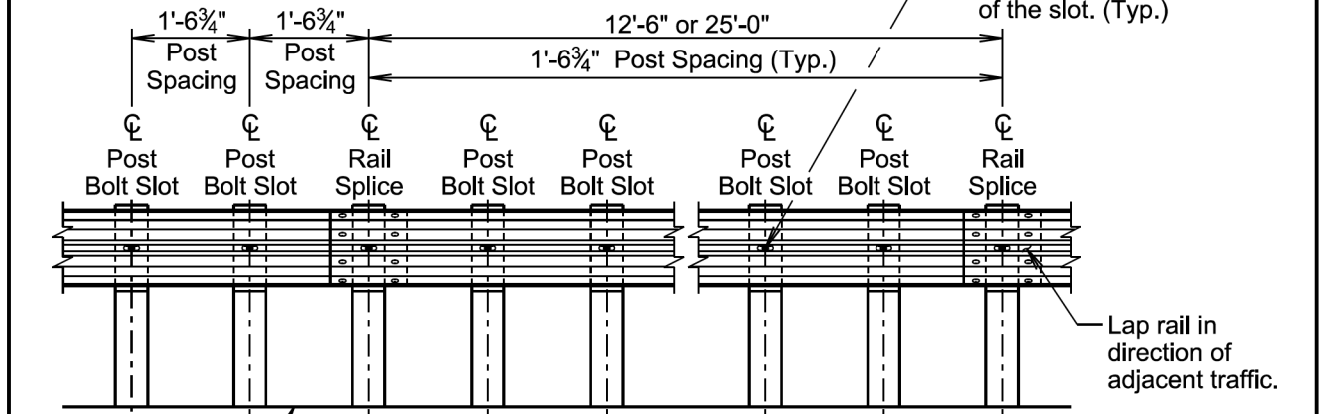
The post bolt should be placed in the center (horizontally and vertically) of the slot. (Typ.)



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

Finished Surface or Ground Line

The post bolt should be placed in the center (horizontally and vertically) of the slot. (Typ.)



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

Finished Surface or Ground Line

Lap rail in direction of adjacent traffic.

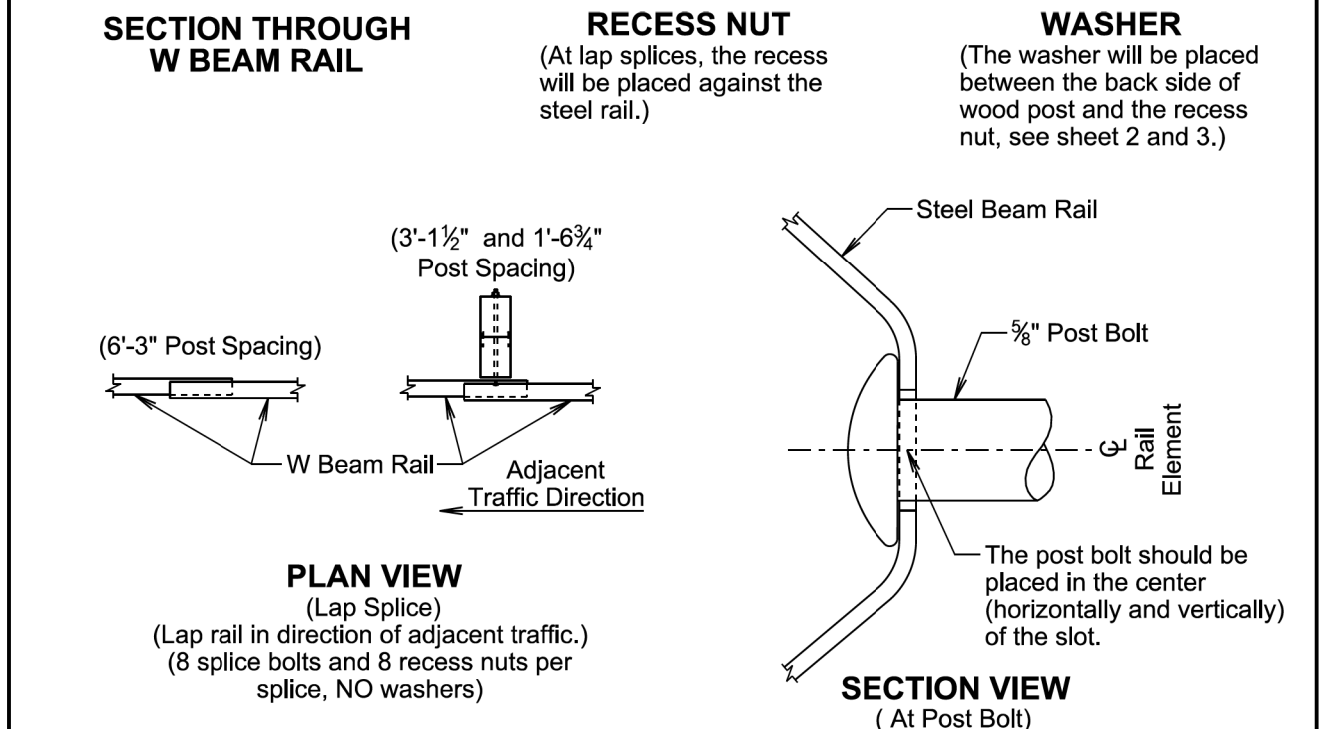
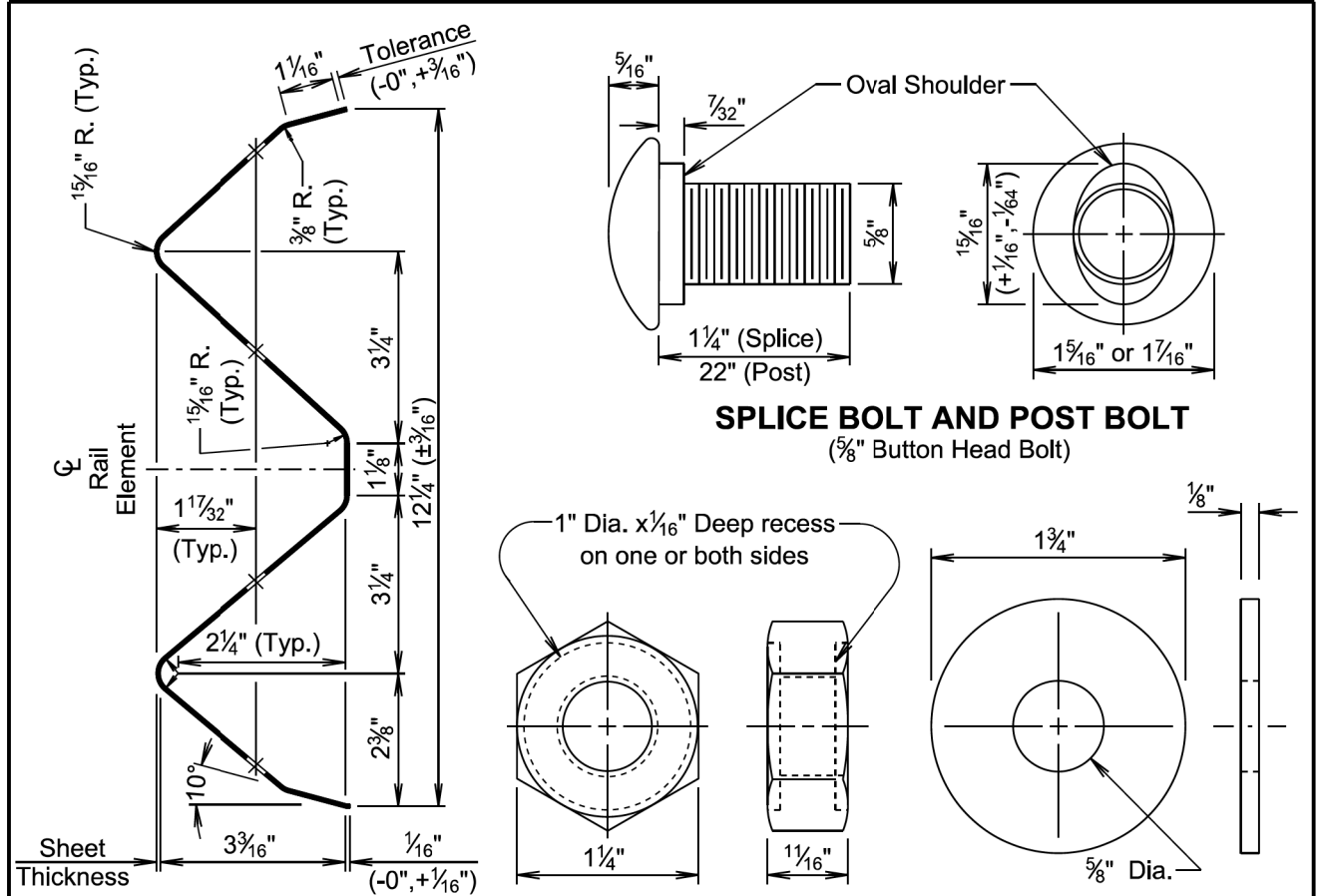
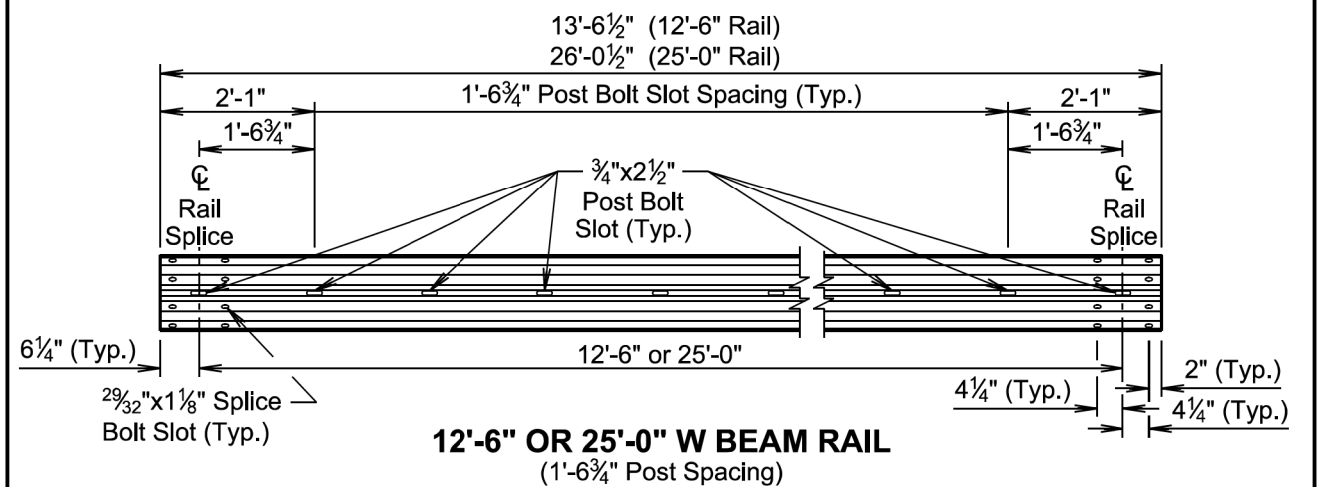
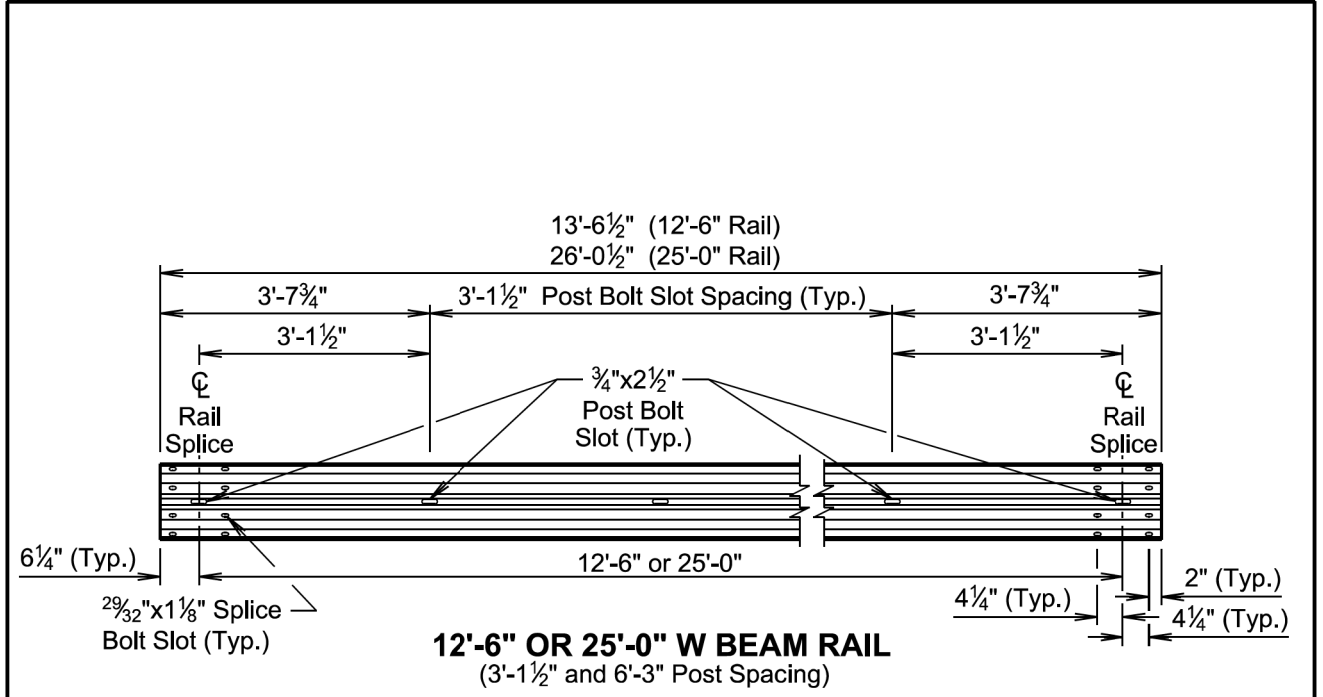
September 14, 2019

S D D O T	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 4 of 6
		Published Date: 1st Qtr. 2023

- Plotted From - TRW11NT35

File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



September 14, 2019

SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 5 of 6
		Published Date: 1st Qtr. 2023

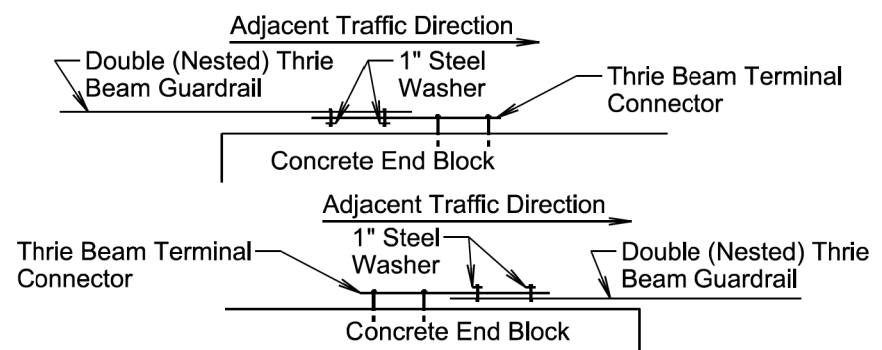
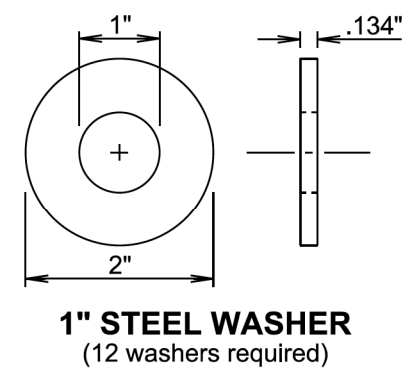
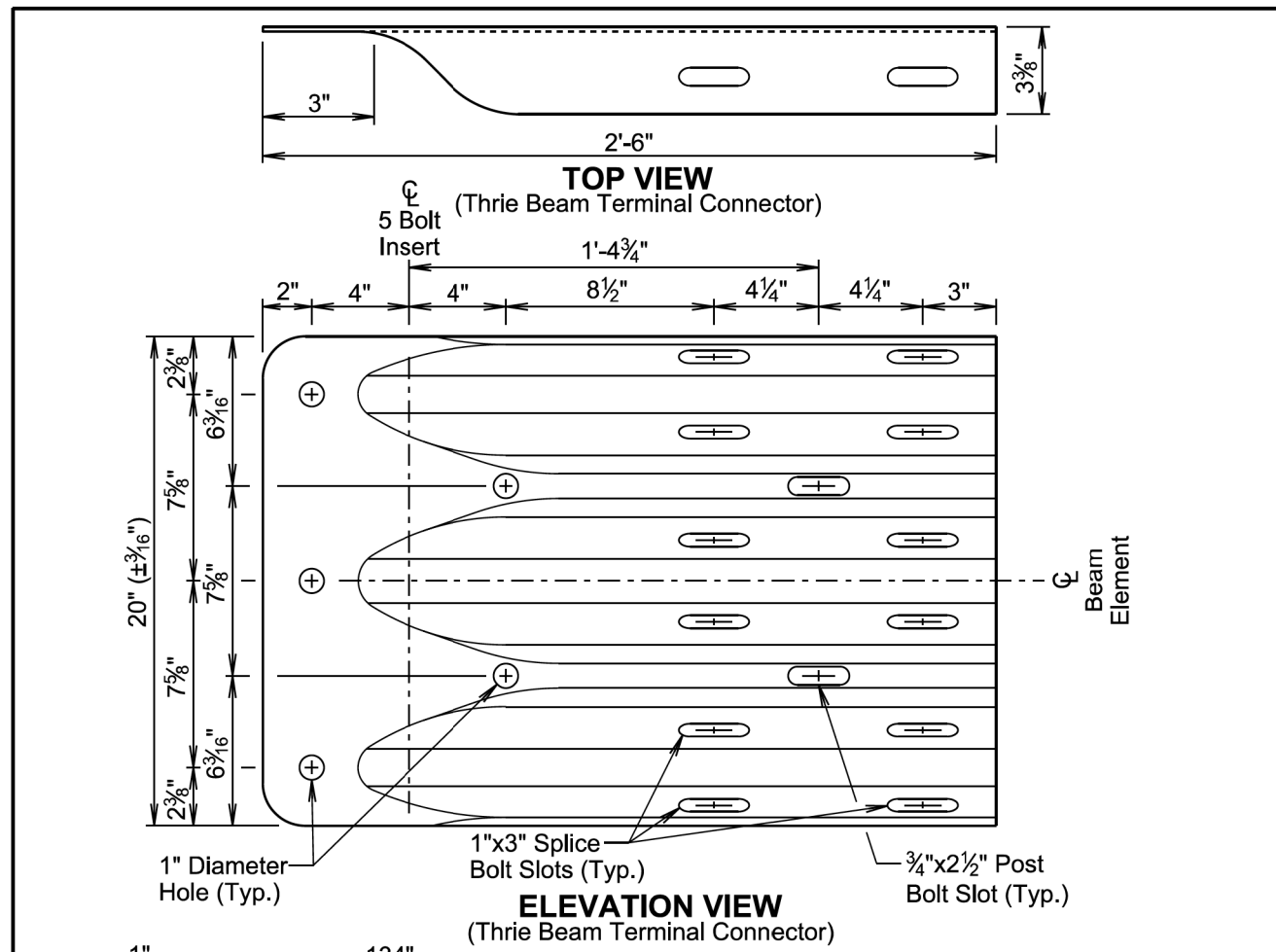
September 14, 2019

SDDOT	MIDWEST GUARDRAIL SYSTEM (MGS)	PLATE NUMBER 630.20
		Sheet 6 of 6
		Published Date: 1st Qtr. 2023

- Plotted From - TRW11NT35

File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



GENERAL NOTES:

Thrie Beam Terminal Connectors will be 10 gauge.

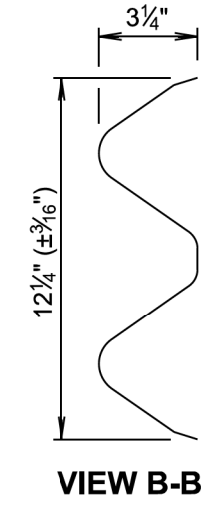
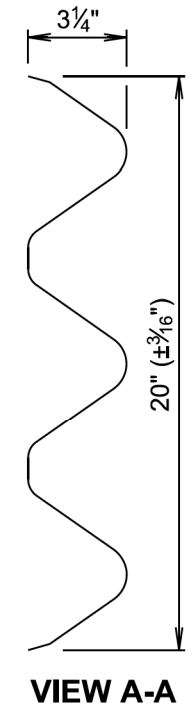
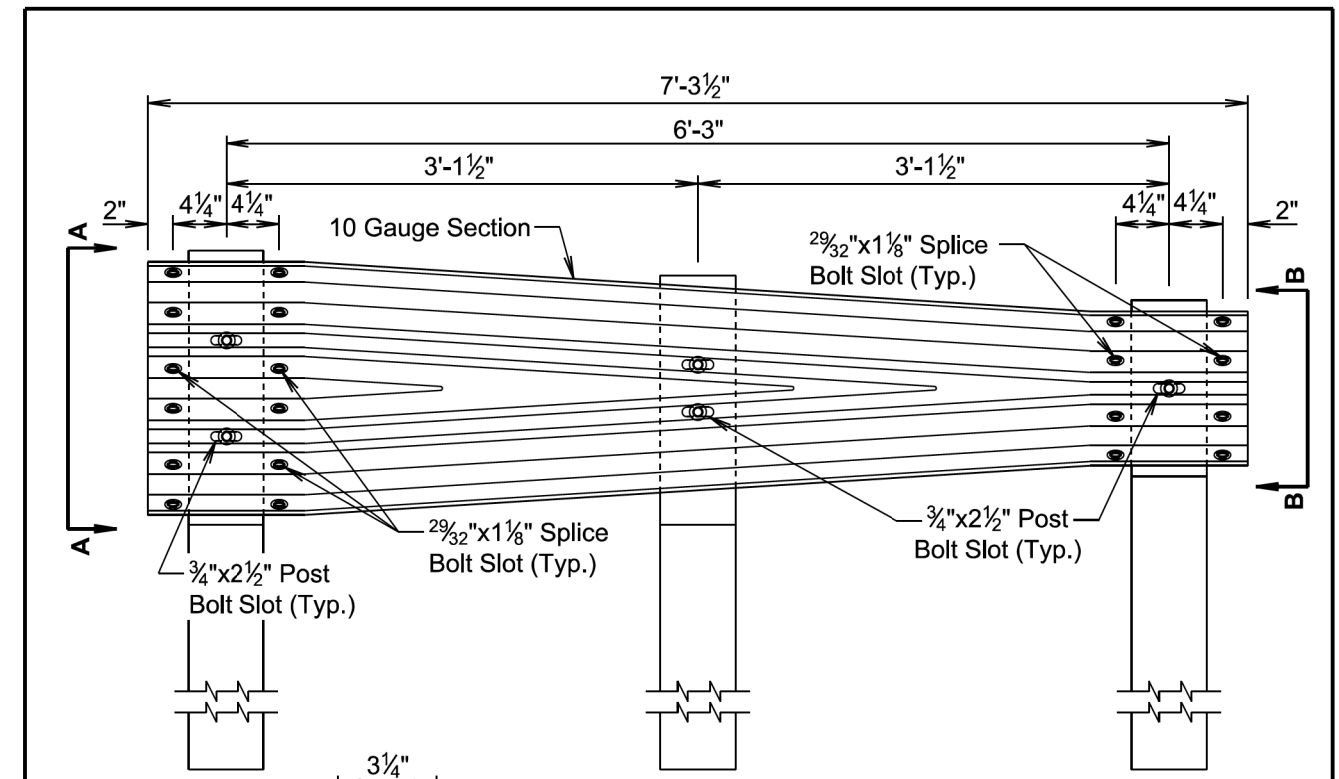
When the thrie beam terminal connector is used to connect the rail to the bridge or concrete end block, 1" steel washers will be used at the lap splice and the washers will be in direct contact with the 3" slots of the thrie beam terminal connector. See the drawings above for the typical locations of 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 will be incidental to the contract unit price of the respective guardrail item it is attached to.

September 14, 2019

S D D O T	THRIE BEAM TERMINAL CONNECTOR	PLATE NUMBER 630.47
		Sheet 1 of 1

Published Date: 1st Qtr. 2023



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 will be incidental to the contract unit price per each for "W Beam to Thrie Beam Guardrail Transition".

September 14, 2019

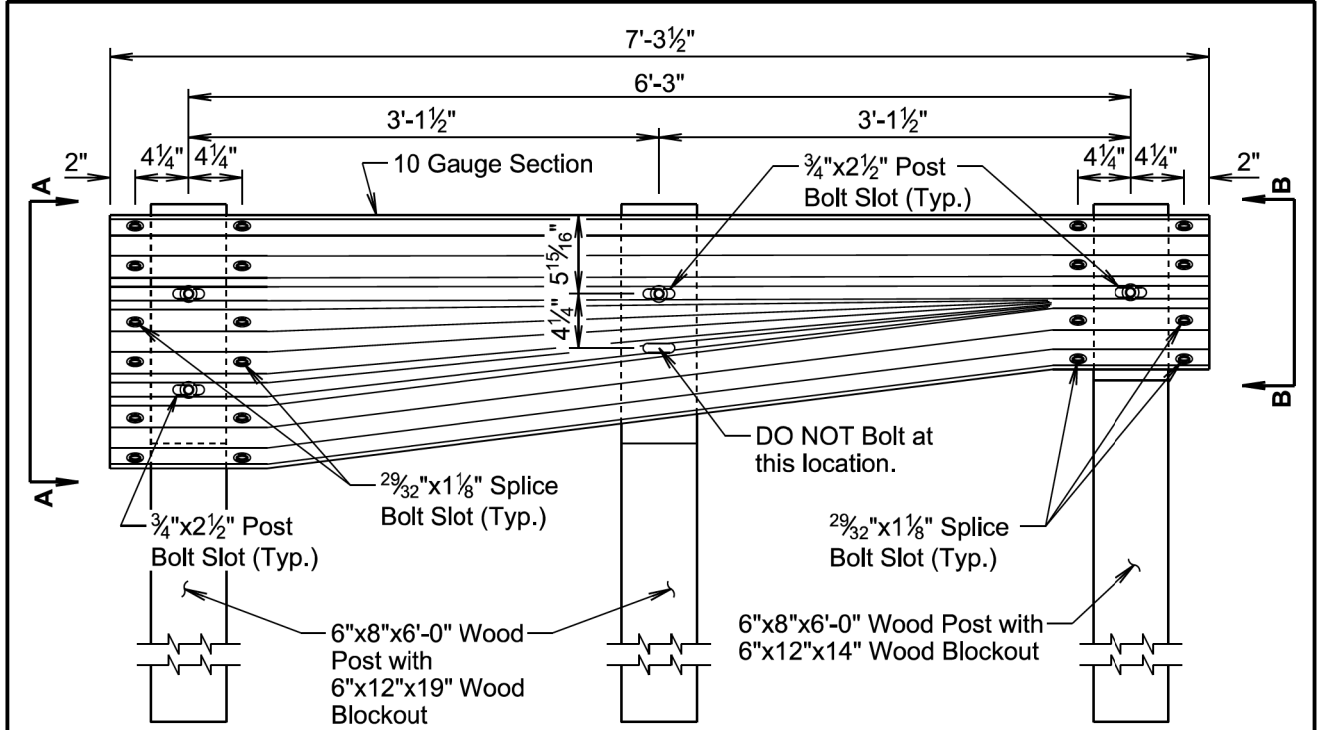
S D D O T	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.48
		Sheet 1 of 1

Published Date: 1st Qtr. 2023

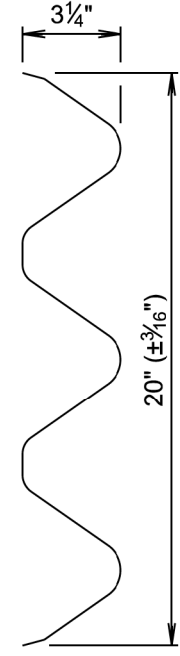
File - ...174E_NonSectionMethod_Revision.dgn

- Plotted From - TRWIN135

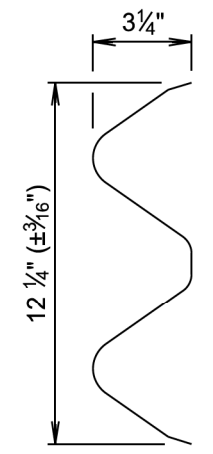
Plot Scale - 1:200



ELEVATION VIEW



VIEW A-A



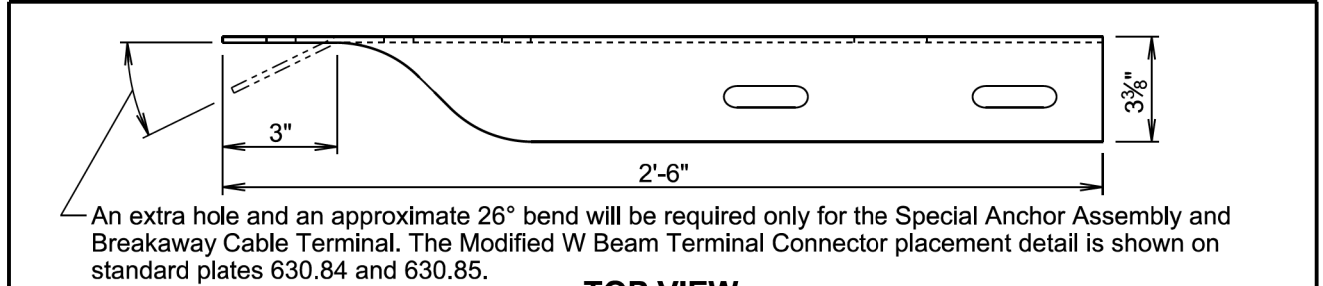
VIEW B-B

GENERAL NOTES:

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

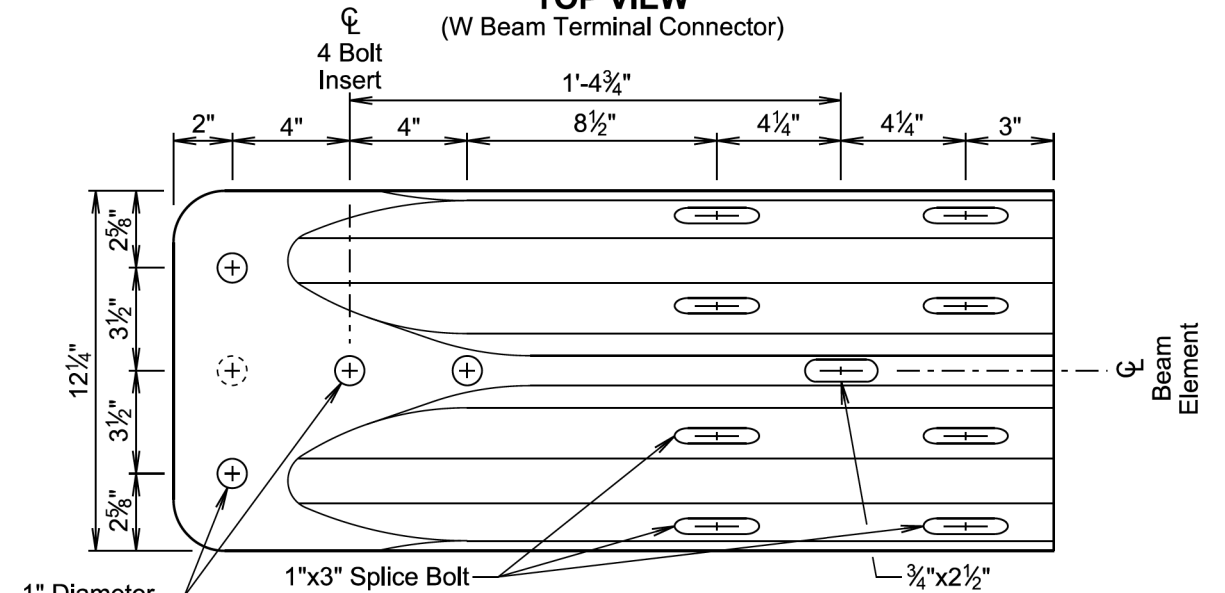
September 14, 2019

<i>Published Date: 1st Qtr. 2023</i>	S D D O T	ASYMMETRICAL W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.49
			Sheet 1 of 1

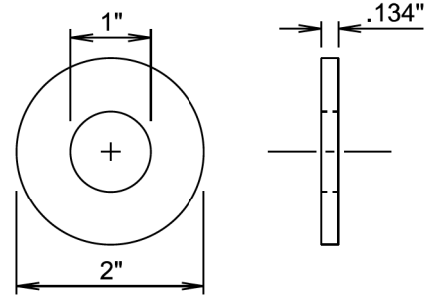


An extra hole and an approximate 26° bend will be required only for the Special Anchor Assembly and Breakaway Cable Terminal. The Modified W Beam Terminal Connector placement detail is shown on standard plates 630.84 and 630.85.

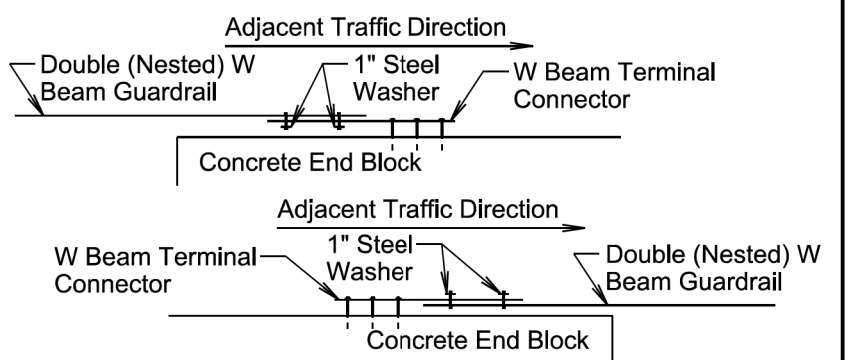
TOP VIEW
(W Beam Terminal Connector)



ELEVATION VIEW
(W Beam Terminal Connector)



1\"/>



PLAN VIEWS

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

GENERAL NOTES:

W Beam Terminal Connectors will be 10 gauge.

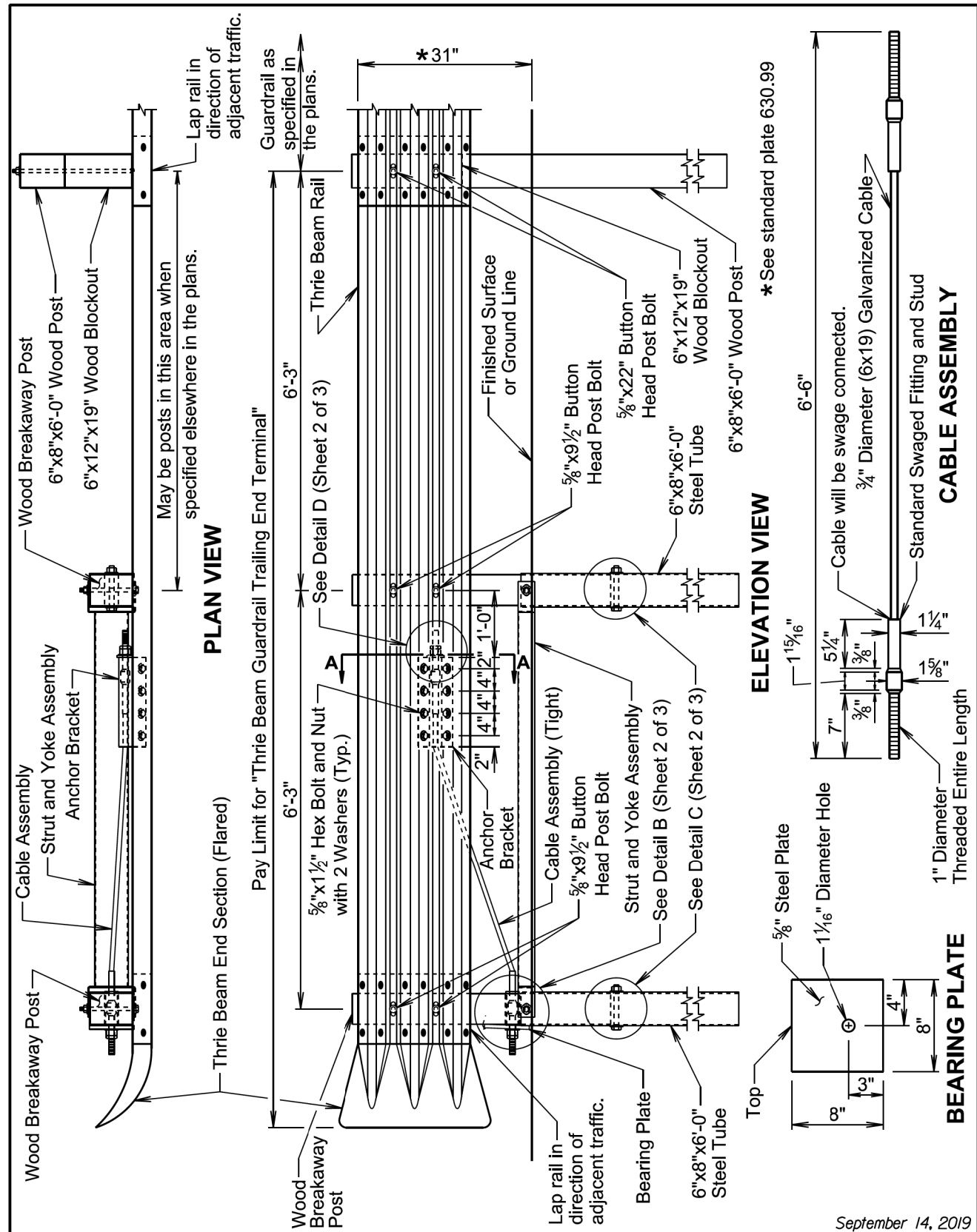
When the W beam terminal connector is used to connect the rail to the bridge or concrete end block, 1" steel washers will be used at the lap splice and the washers will be in direct contact with the 3" slots of the W beam terminal connector. See the drawings above for the typical locations of the 1" 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 will be incidental to the contract unit price of the respective guardrail item it is attached to.

September 14, 2019

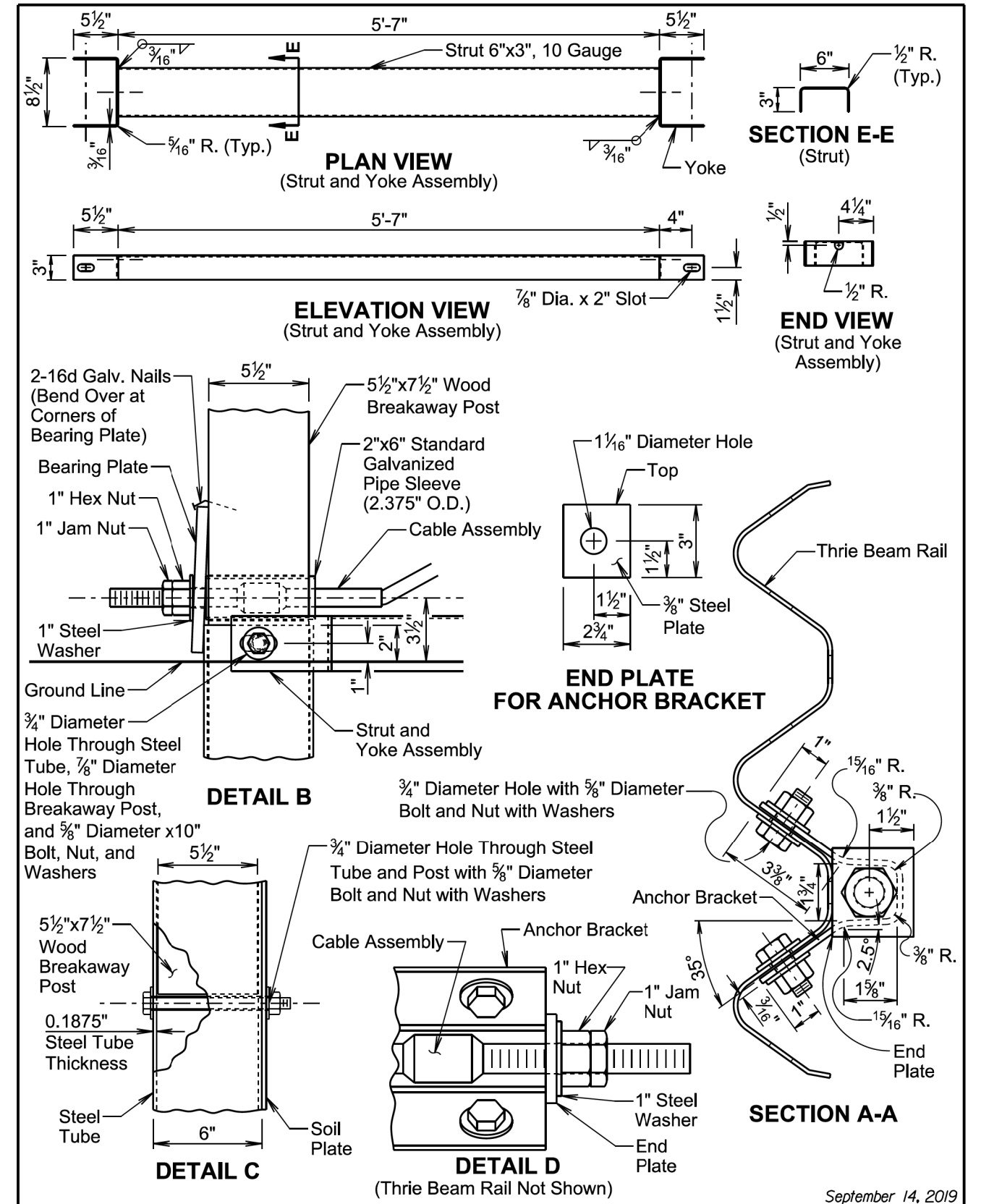
<i>Published Date: 1st Qtr. 2023</i>	S D D O T	W BEAM TERMINAL CONNECTOR	PLATE NUMBER 630.59
			Sheet 1 of 1

File - ...174E_NonSectionMethod_Revision.dgn



September 14, 2019

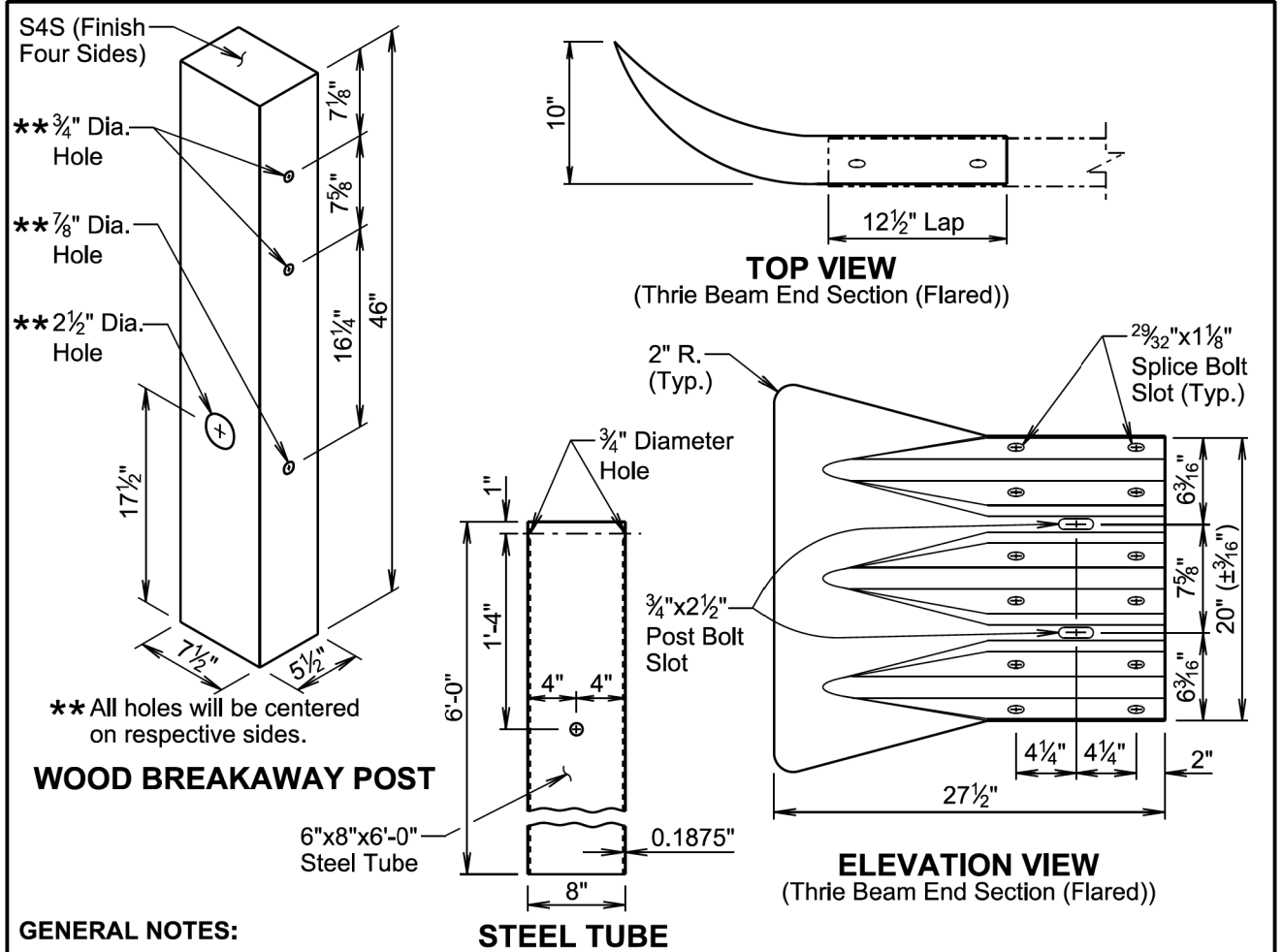
Published Date: 1st Qtr. 2023	SDDOT	THRIE BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 1 of 3



September 14, 2019

Published Date: 1st Qtr. 2023	SDDOT	THRIE BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 2 of 3

Plot Scale - 1:200



WOOD BREAKAWAY POST

STEEL TUBE

GENERAL NOTES:

The thrie beam guardrail trailing end terminal will only be used in a one-way traffic situation on the downstream traffic flow end.

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

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

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

All hardware will be galvanized in accordance with ASTM A153.

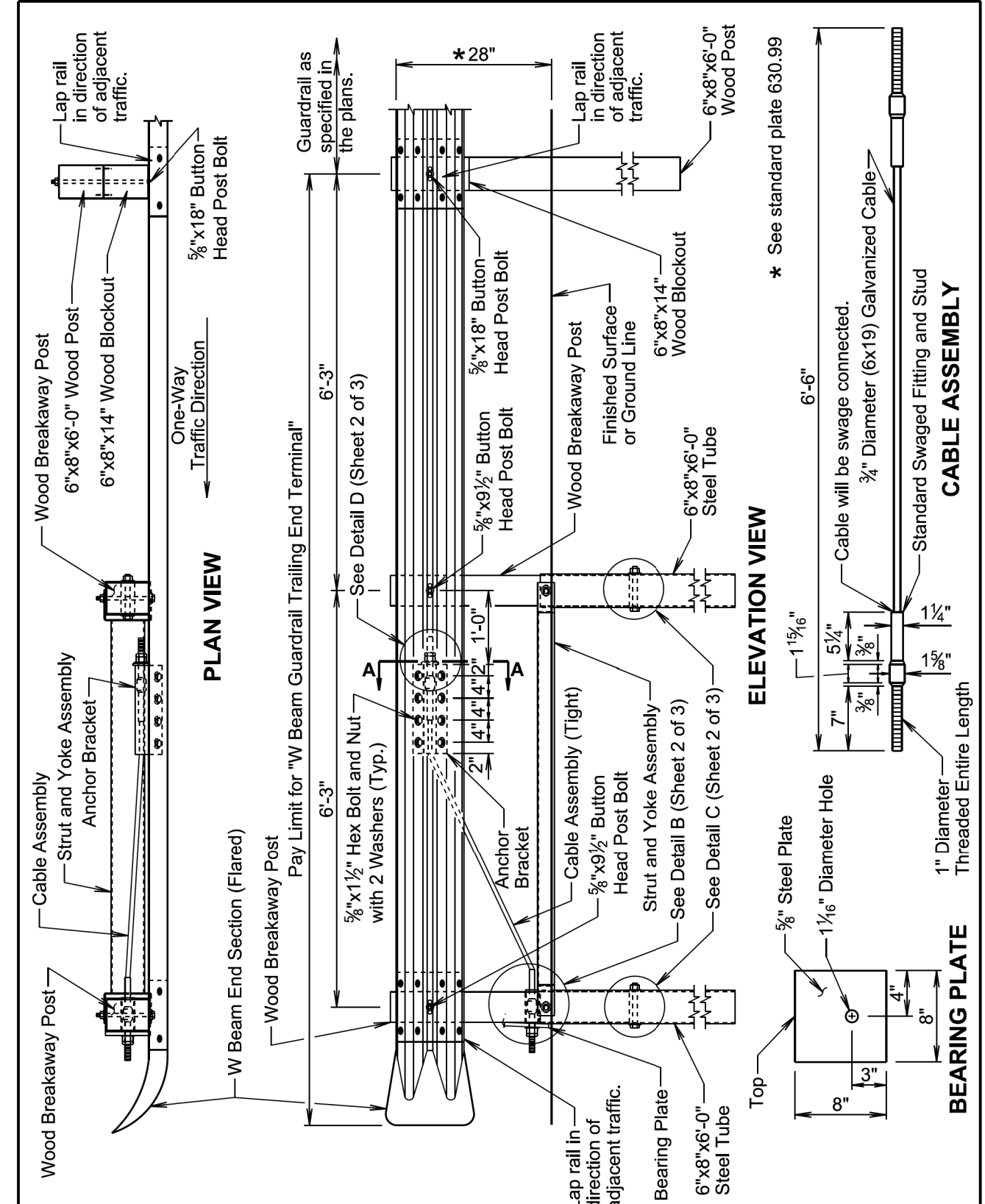
The anchor bracket, soil plate, and bearing plate will be fabricated from steel that meets ASTM A36 Specifications. They will be galvanized after fabrication in accordance with ASTM A123.

Slots in the rails will 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 will 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 will be included in the contract unit price per each for "Thrie Beam Guardrail Trailing End Terminal".

September 14, 2019

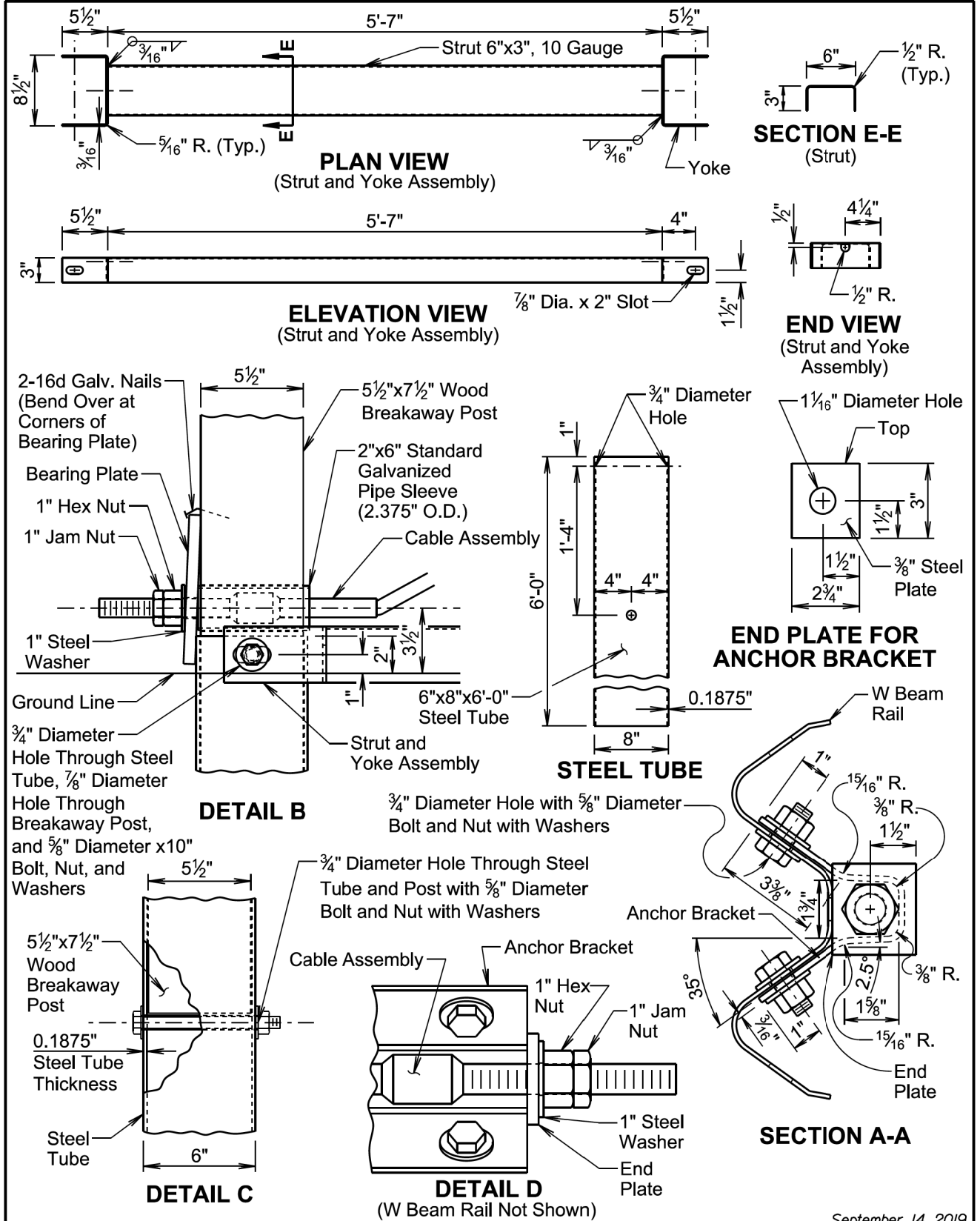
S D D O T	THRIE BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
	Published Date: 1st Qtr. 2023	Sheet 3 of 3



S D D O T	W BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.81
	Published Date: 1st Qtr. 2023	Sheet 1 of 3

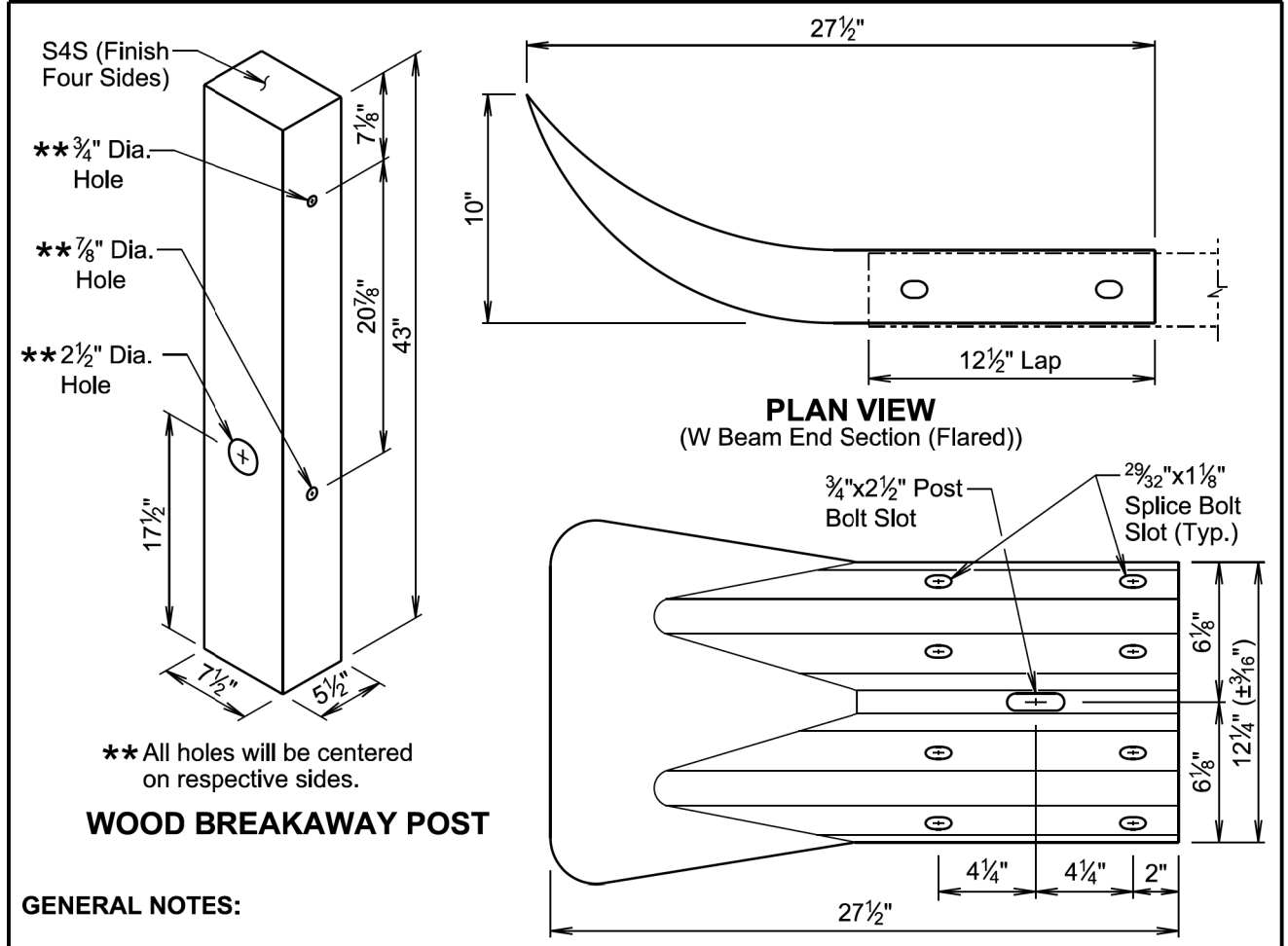
File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



September 14, 2019

S D D O T	W BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.81
		Sheet 2 of 3
	<i>Published Date: 1st Qtr. 2023</i>	



GENERAL NOTES:

The W beam guardrail trailing end terminal will only be used in a one-way traffic situation on the downstream traffic flow end.

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

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

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

All hardware will be galvanized in accordance with ASTM A153.

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

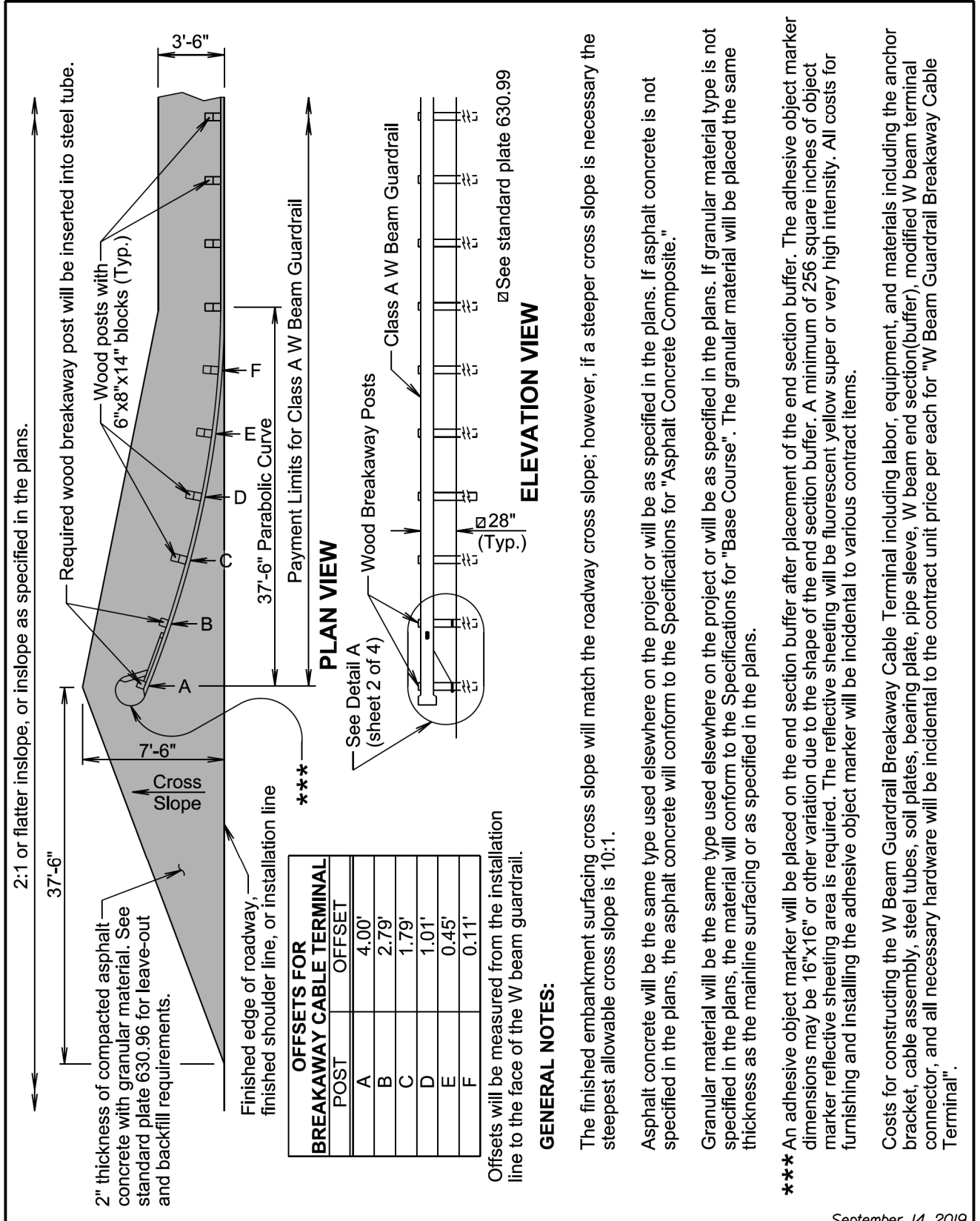
Slots in the rails will be provided as specified in the plans and by the manufacturer. A drilled hole through the rail is not allowed as a replacement for a slot. If the Contractor must create a slot, a cutting torch or plasma cutter is not allowed. The slot edges will be smooth and free of burrs or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

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

September 14, 2019

S D D O T	W BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.81
		Sheet 3 of 3
	<i>Published Date: 1st Qtr. 2023</i>	

File - ...174E_NonSectionMethod_Revision.dgn



Published Date: 1st Qtr. 2023

SDOT

W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL

September 14, 2019

PLATE NUMBER
630.85

Sheet 1 of 4

GENERAL NOTES:

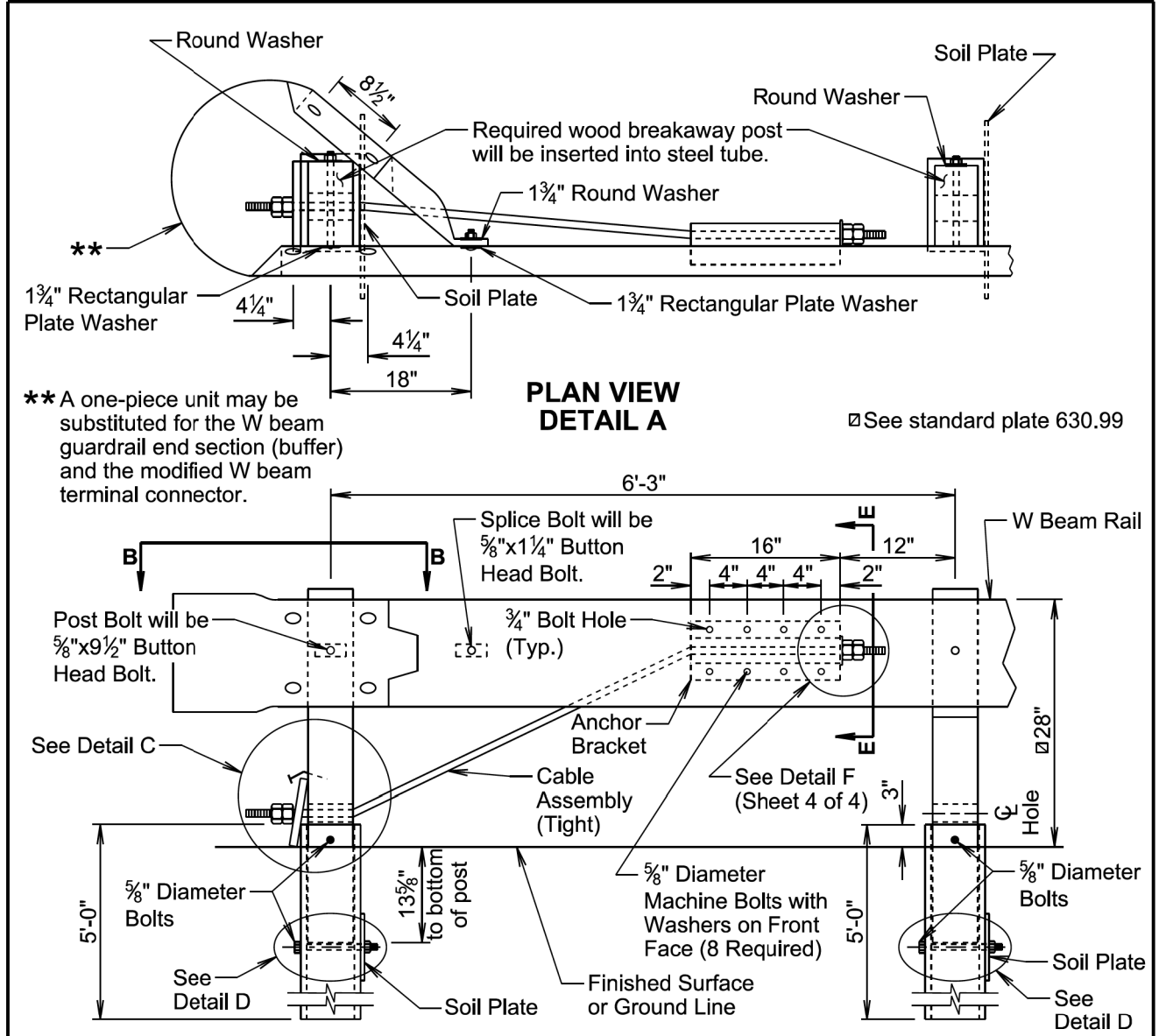
The finished embankment surfacing cross slope will match the roadway cross slope; however, if a steeper cross slope is necessary the steepest allowable cross slope is 10:1.

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

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

*** An adhesive object marker will be placed on the end section buffer after placement of the end section buffer. The adhesive object marker dimensions may be 16"x16" 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 will be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker will 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 will be incidental to the contract unit price per each for "W Beam Guardrail Breakaway Cable Terminal".



GENERAL NOTES:

All hardware will be galvanized in accordance with ASTM A153.

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

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

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

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

Published Date: 1st Qtr. 2023

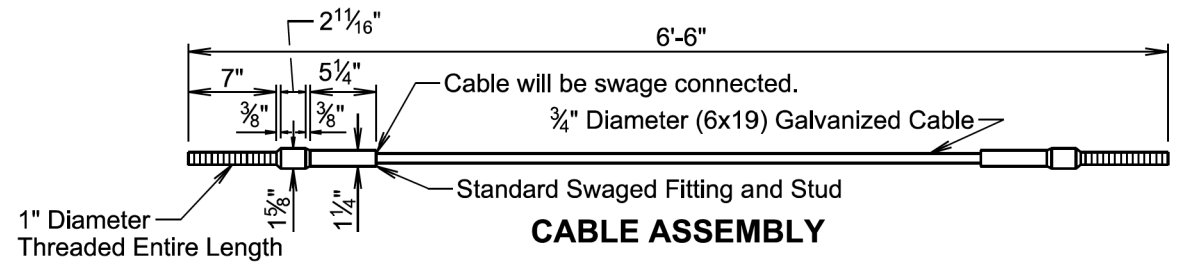
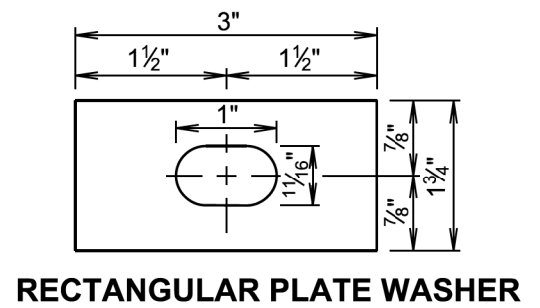
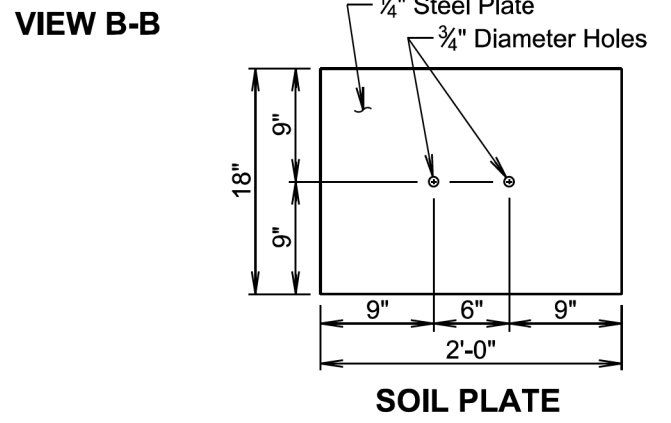
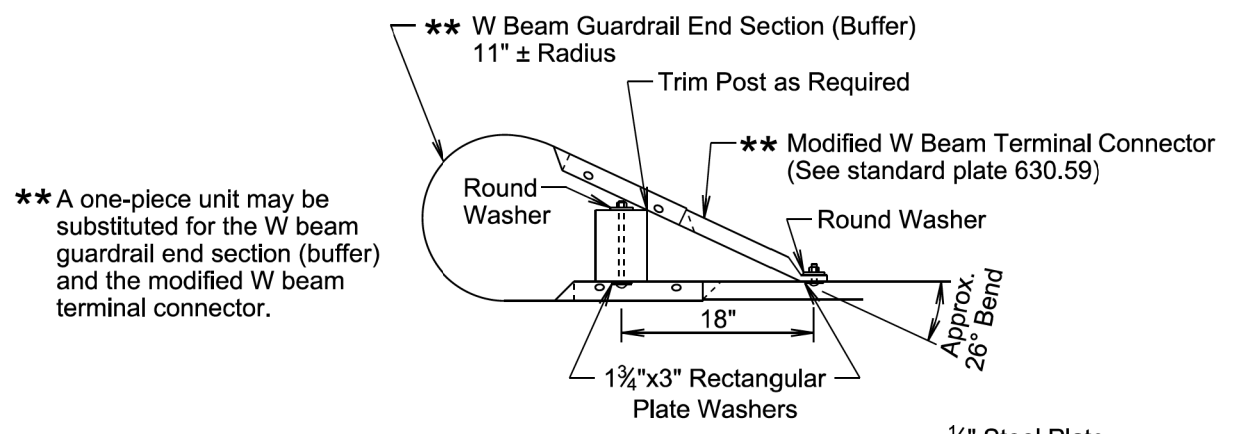
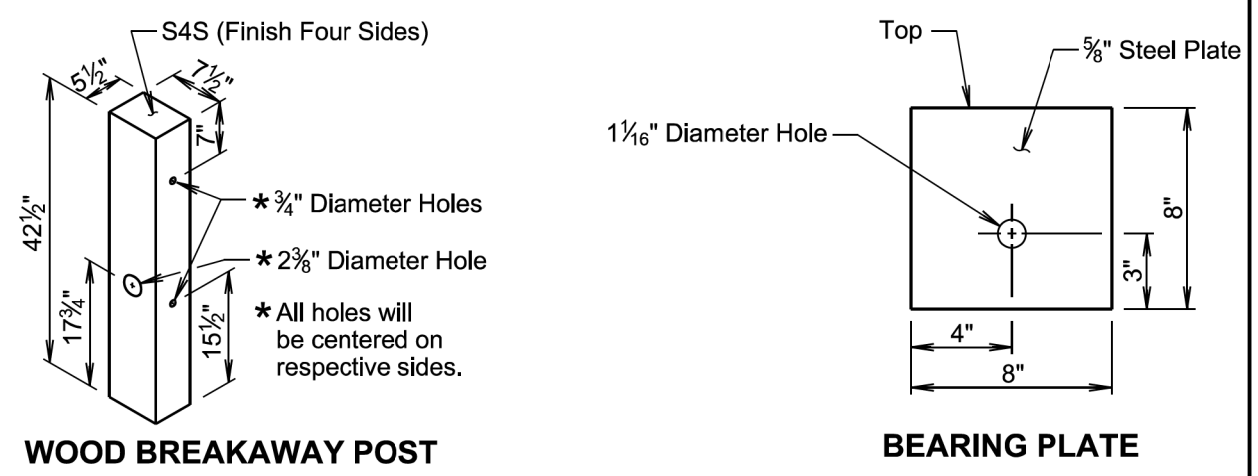
SDOT

W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL

September 14, 2019

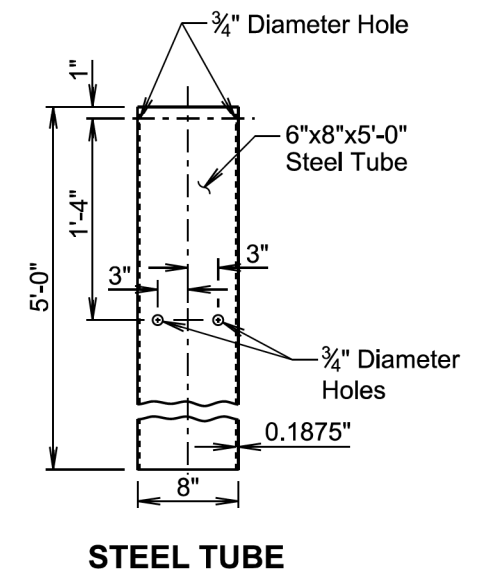
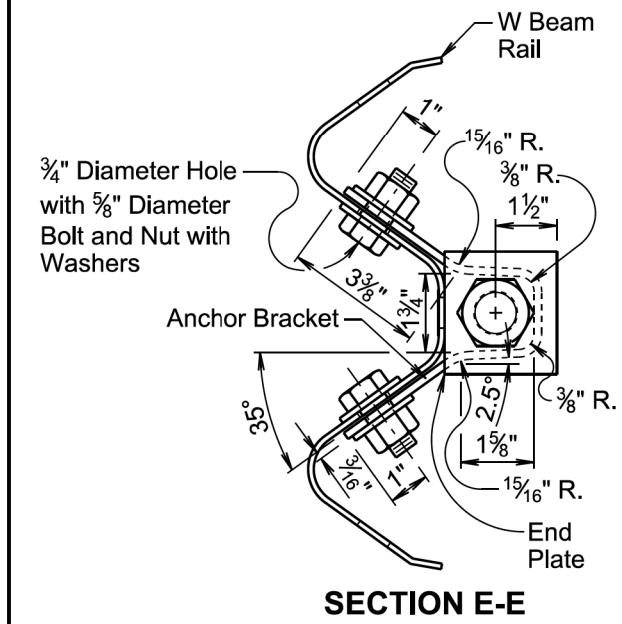
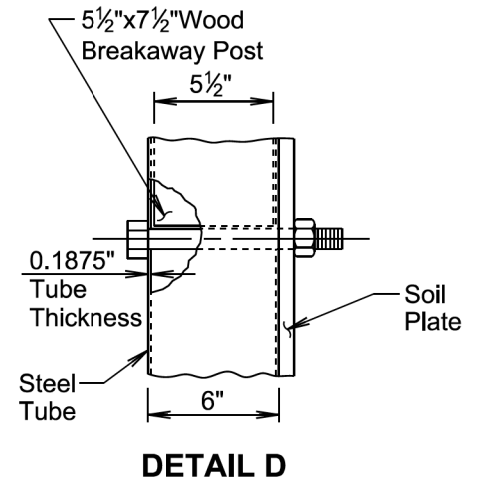
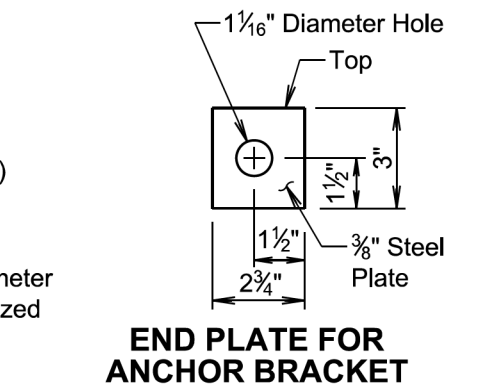
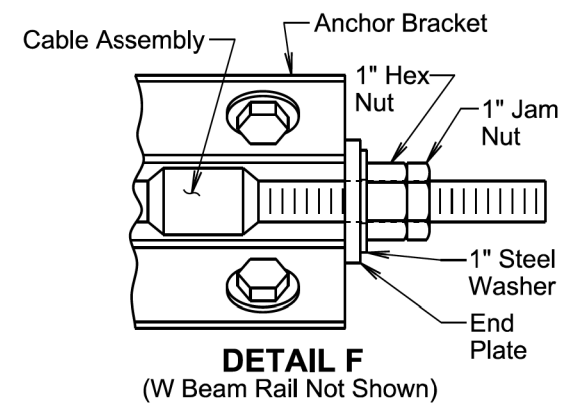
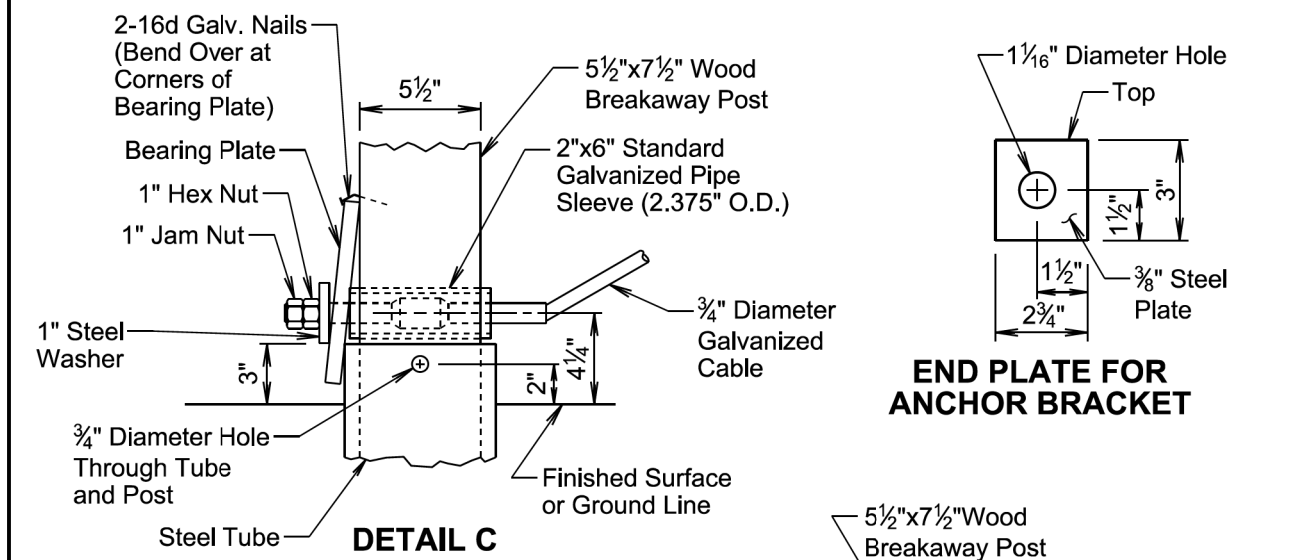
PLATE NUMBER
630.85

Sheet 2 of 4



September 14, 2019

Published Date: 1st Qtr. 2023	S D D O T	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.85
			Sheet 3 of 4



September 14, 2019

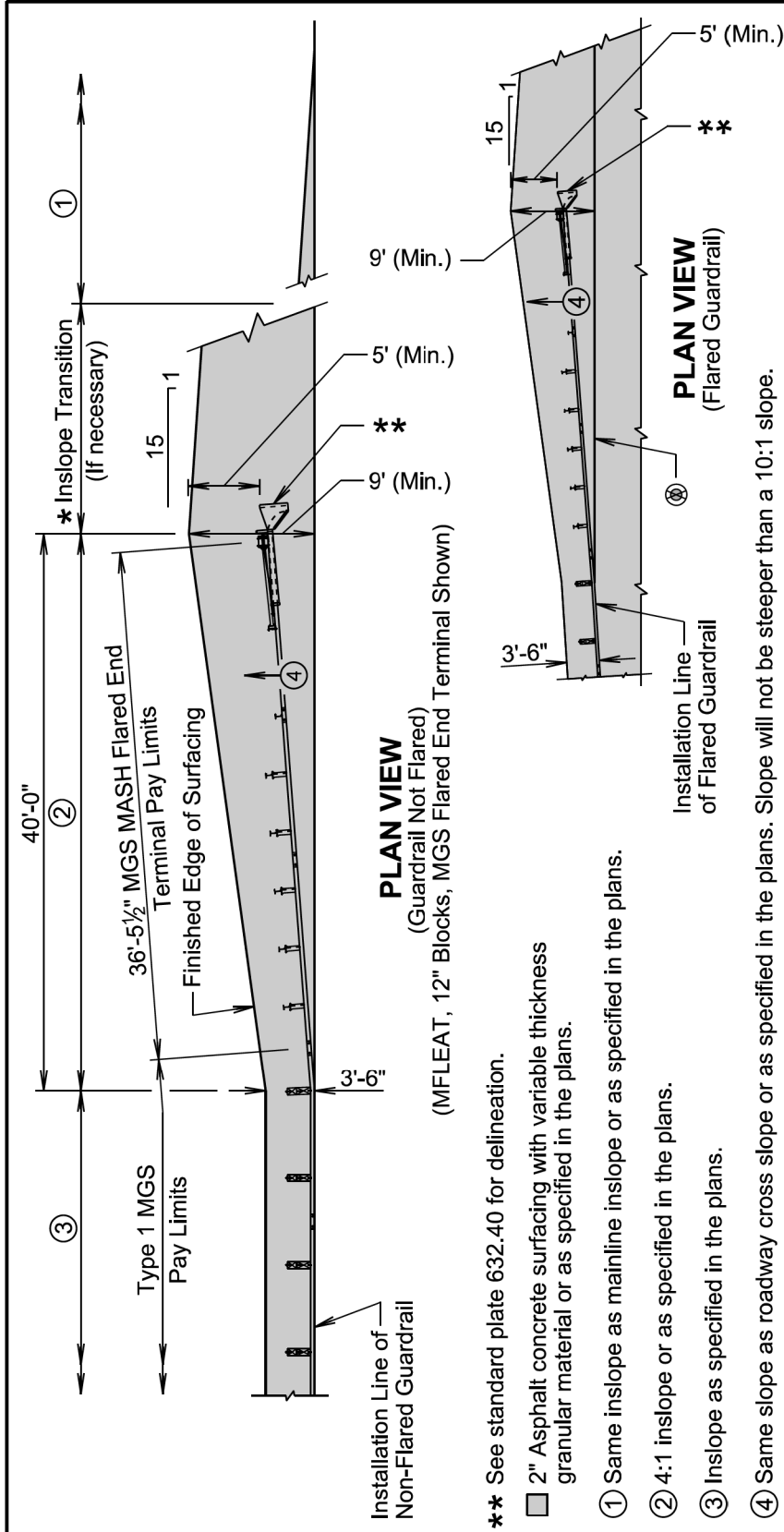
Published Date: 1st Qtr. 2023	S D D O T	W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL	PLATE NUMBER 630.85
			Sheet 4 of 4

Plot Scale - 1:200

TRW11NT35

Plotted From -

File - ...174E_NonSectionMethod_Revision.dgn



PLAN VIEW
(Guardrail Not Flared)
(MFLEAT, 12" Blocks, MGS Flared End Terminal Shown)

- ** See standard plate 632.40 for delineation.
- 2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.
- ① Same inslope as mainline inslope or as specified in the plans.
- ② 4:1 inslope or as specified in the plans.
- ③ Inslope as specified in the plans.
- ④ Same slope as roadway cross slope or as specified in the plans. Slope will not be steeper than a 10:1 slope.

GENERAL NOTES:

The flared guardrail end terminals above are for illustrative purpose only.

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

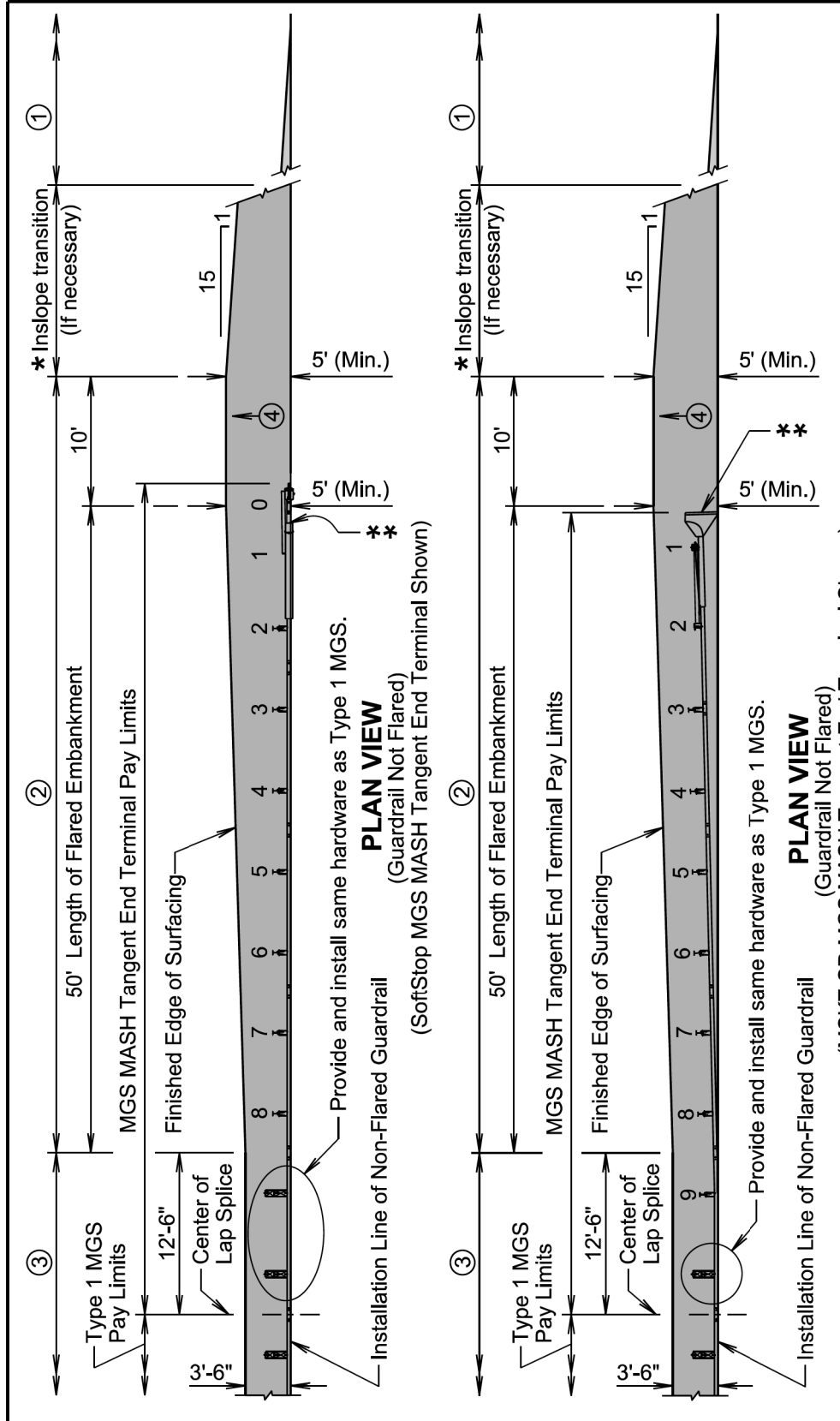
④ The installation reference line for flared guardrail end terminals will always be parallel to the roadway.

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

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

June 26, 2019

SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH FLARED END TERMINAL	PLATE NUMBER 630.87
	Published Date: 1st Qtr. 2023	Sheet 1 of 1



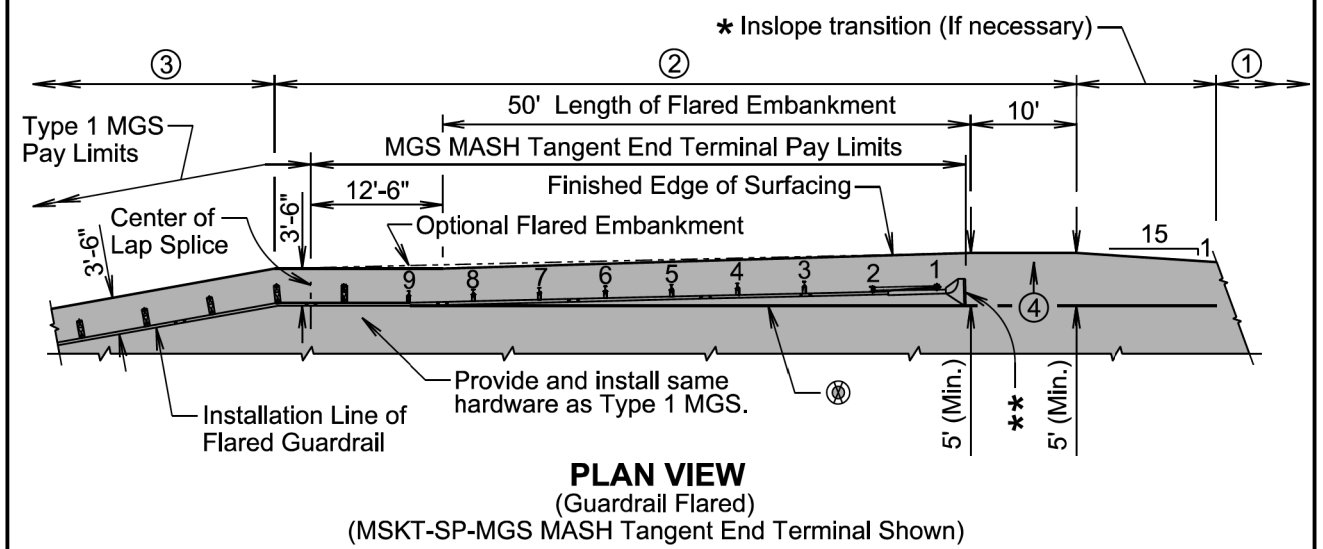
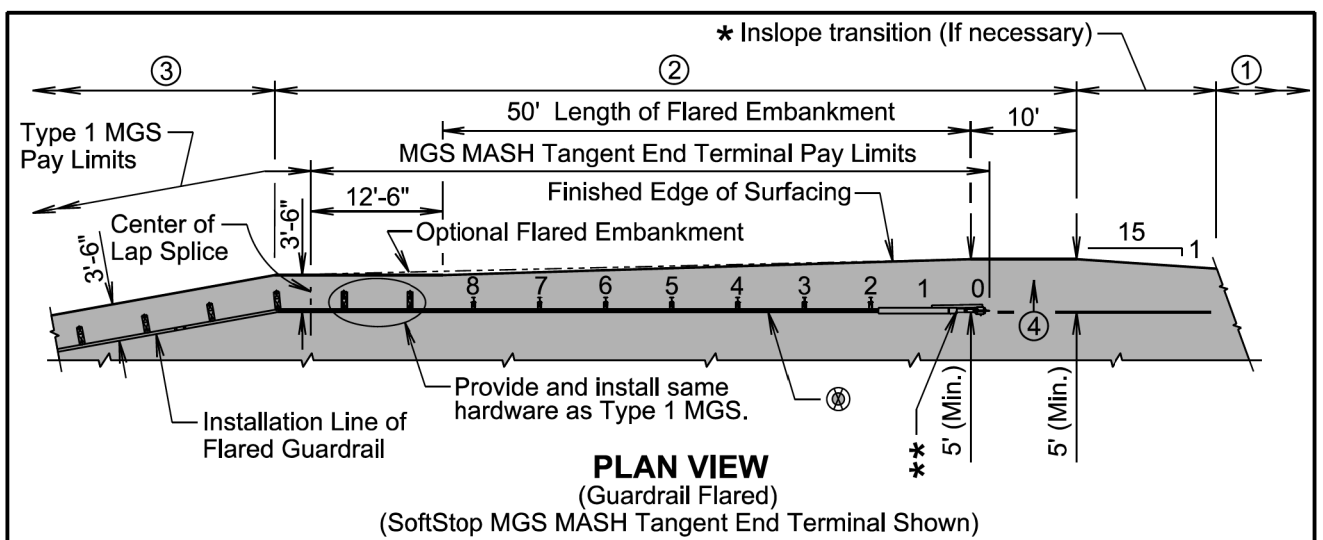
PLAN VIEW
(Guardrail Not Flared)
(SoftStop MGS MASH Tangent End Terminal Shown)

- ** See standard plate 632.40 for delineation.
- 2" Asphalt concrete surfacing with variable thickness granular material or as specified in the plans.
- ① Same inslope as mainline inslope or as specified in the plans.
- ② 4:1 inslope or as specified in the plans.
- ③ Inslope as specified in the plans.
- ④ Same slope as roadway cross slope or as specified in the plans. Slope will not be steeper than a 10:1 slope.

November 19, 2021

SDDOT	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89
	Published Date: 1st Qtr. 2023	Sheet 1 of 2

Plot Scale - 1:200



GENERAL NOTES:

The MGS MASH tangent end terminals above are for illustrative purpose only. Pay limit length of the MGS MASH tangent end terminal is 62'-6".

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

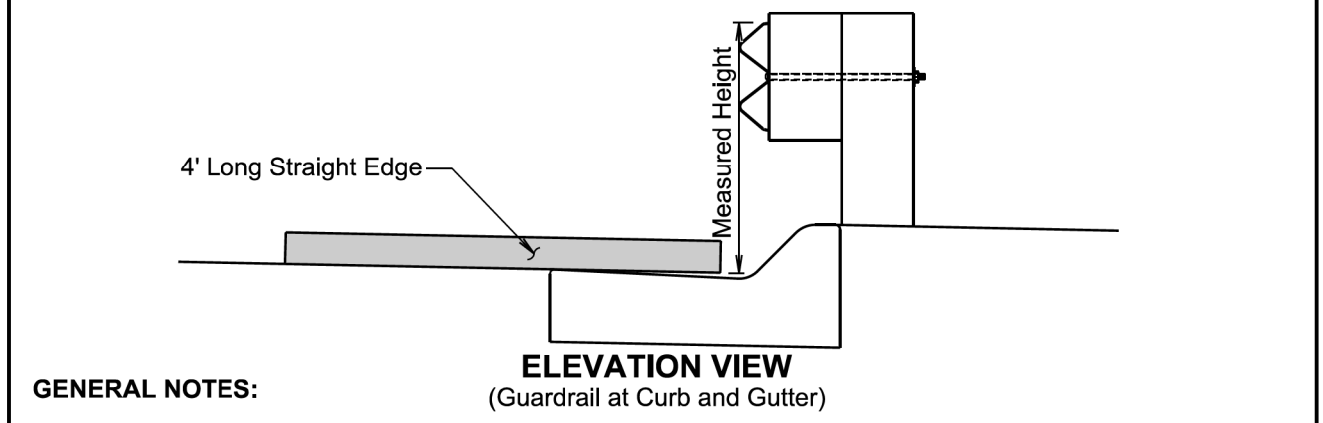
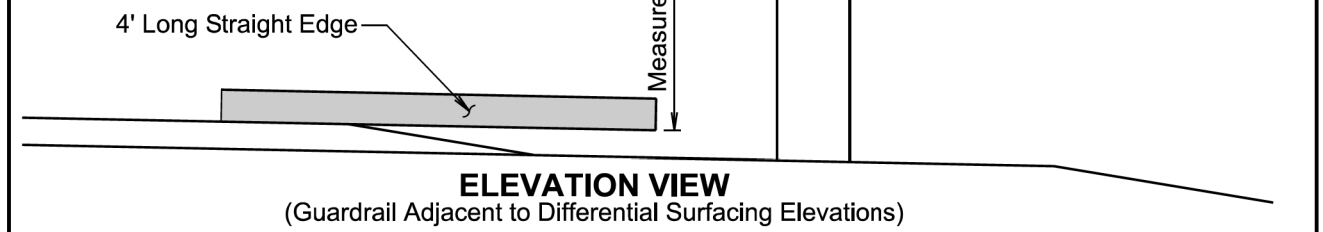
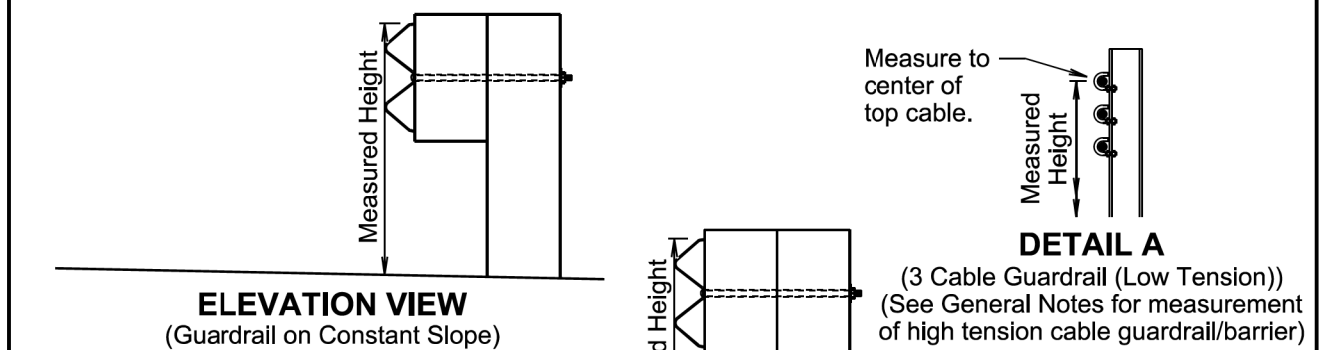
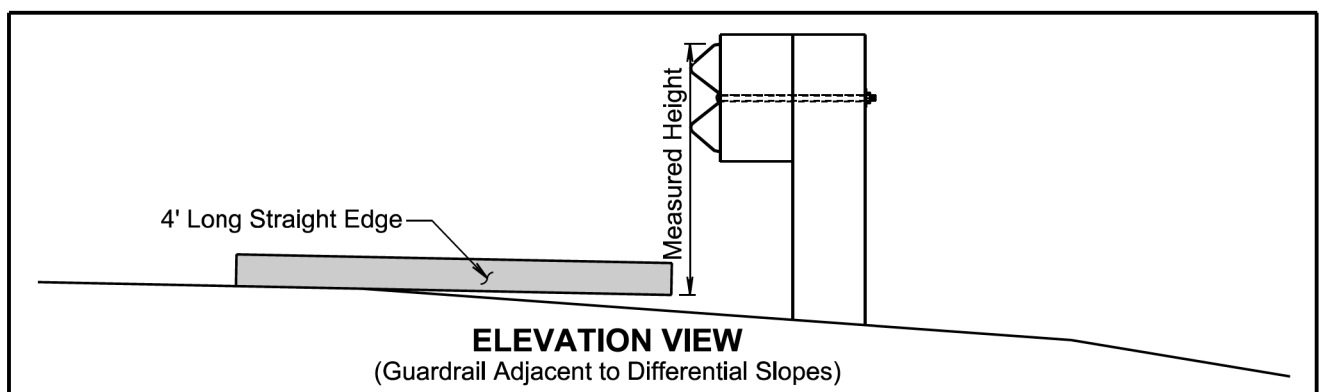
⊗ The installation reference line for MGS MASH tangent end terminals will always be parallel to the roadway.

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

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

November 19, 2021

S D D O T	EMBANKMENT, SURFACING, AND PAYMENT LIMITS FOR MGS MASH TANGENT END TERMINAL	PLATE NUMBER 630.89
	Published Date: 1st Qtr. 2023	Sheet 2 of 2



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 will be measured in accordance with this standard plate.

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

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

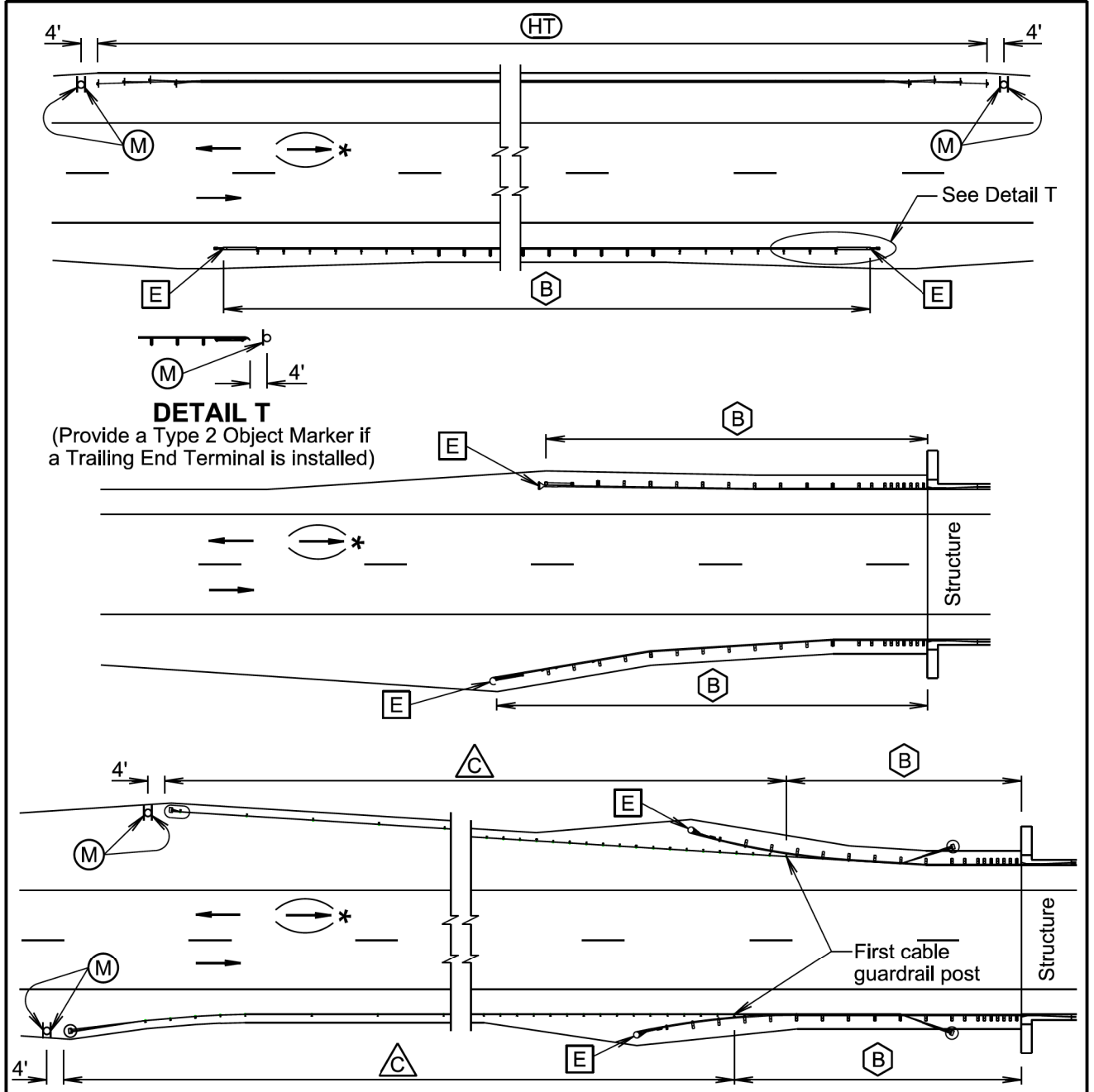
September 14, 2019

S D D O T	MEASURING GUARDRAIL HEIGHT	PLATE NUMBER 630.99
	Published Date: 1st Qtr. 2023	Sheet 1 of 1

- Plotted From - TRW11N135

File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



DETAIL T
(Provide a Type 2 Object Marker if a Trailing End Terminal is installed)

PLAN VIEW
(Typical Guardrail Layouts)

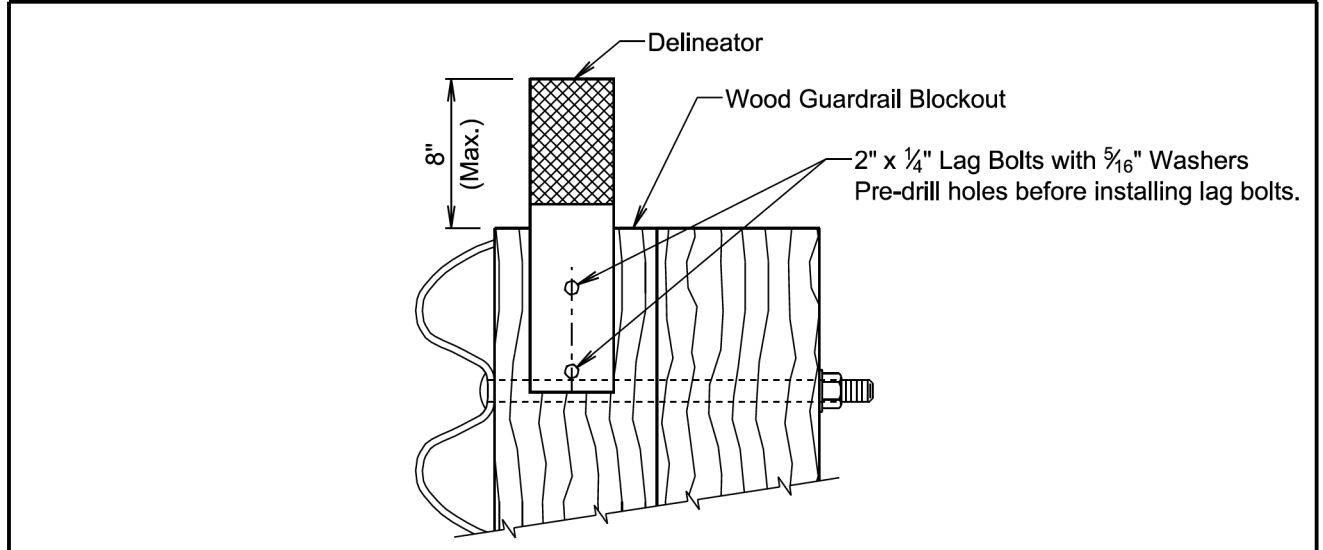
- B Steel Beam Guardrail Delineation
- E Guardrail End Terminal Object Marker
- C 3 Cable Guardrail (Low Tension) Delineation
- HT High Tension Cable Guardrail Delineation
- M Type 2 Object Marker

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

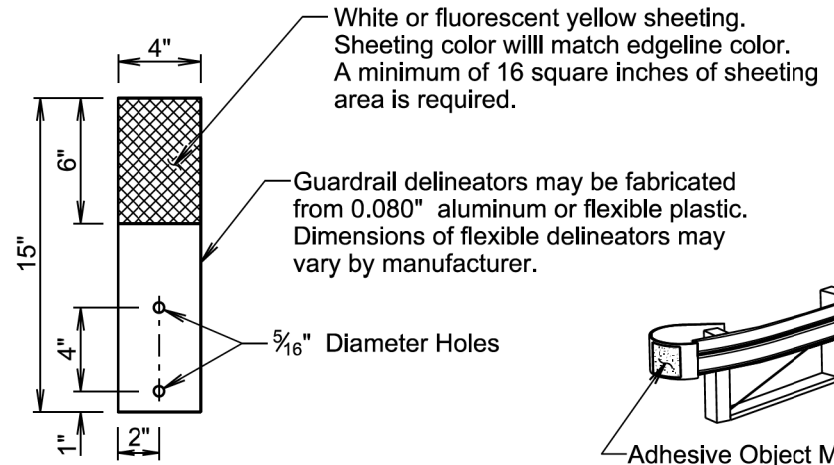
December 23, 2019

SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
		Sheet 1 of 4
Published Date: 1st Qtr. 2023		

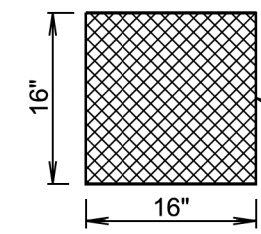
- Plotted From - TRW11NT35



B **STEEL BEAM GUARDRAIL DELINEATION**



DELINEATOR
(For Steel Beam Guardrail)

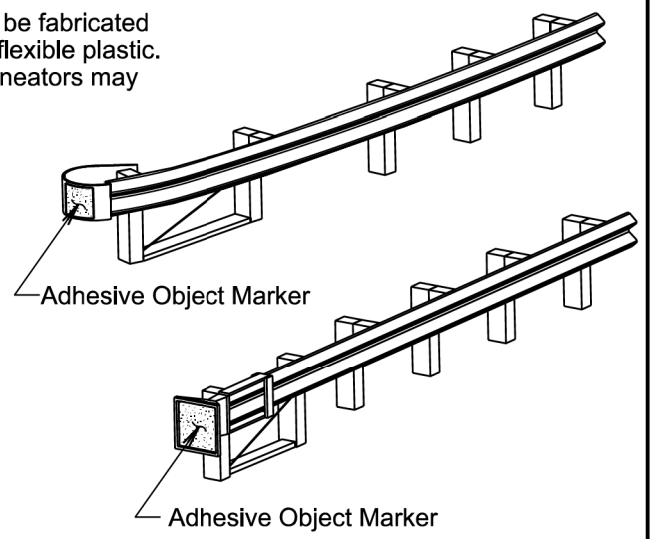


ADHESIVE OBJECT MARKER

White or fluorescent yellow sheeting. Sheeting color will match edgeline color. A minimum of 16 square inches of sheeting area is required.

Guardrail delineators may be fabricated from 0.080" aluminum or flexible plastic. Dimensions of flexible delineators may vary by manufacturer.

Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting will be fluorescent yellow.



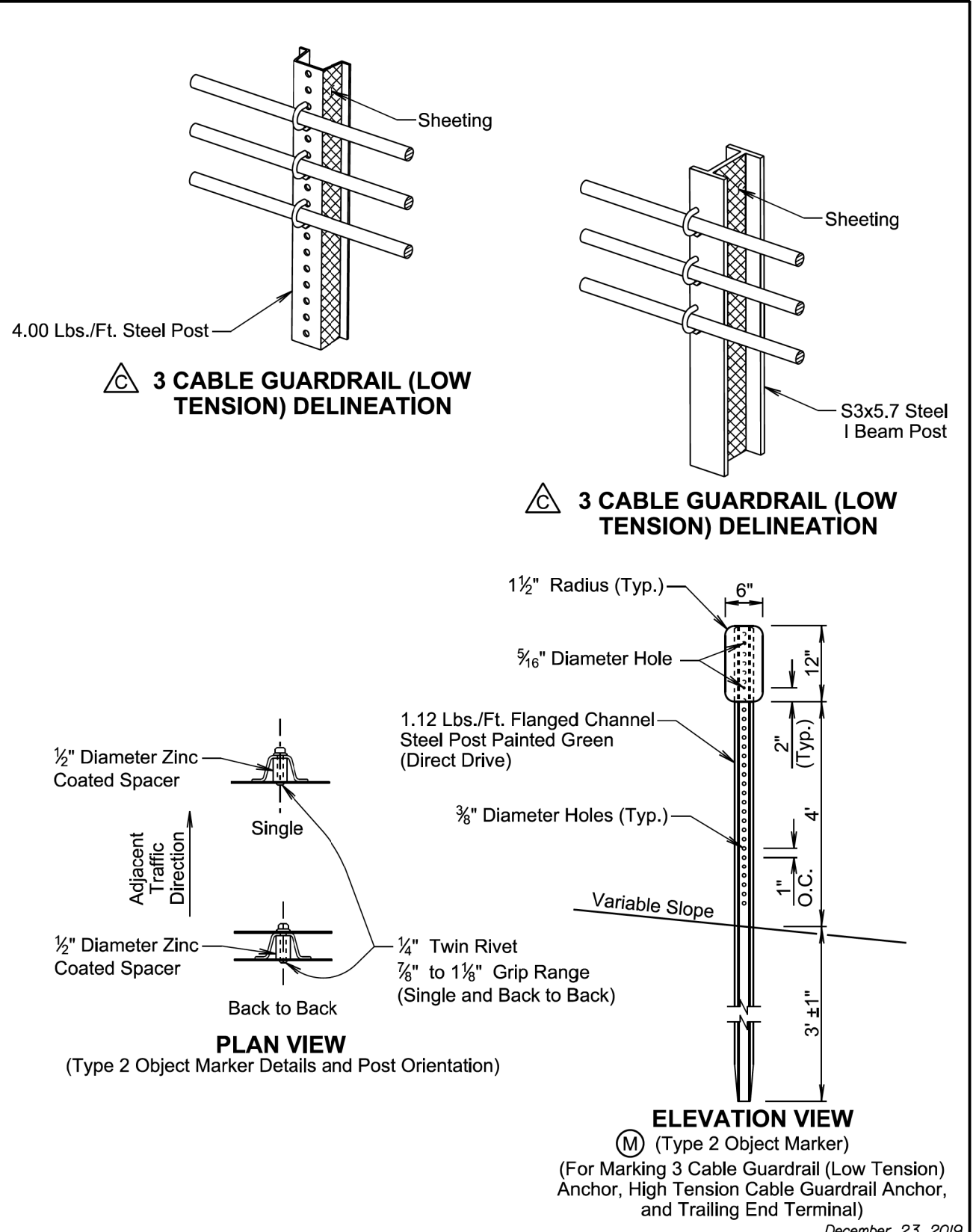
E **GUARDRAIL END TERMINAL OBJECT MARKER**

December 23, 2019

SDDOT	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
		Sheet 2 of 4
Published Date: 1st Qtr. 2023		

File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



December 23, 2019

Published Date: 1st Qtr. 2023	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 will be reflective sheeting placed back to back on every other post cap or cable spacer. The sheeting will 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 (low tension) posts will be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting will be type XI in conformance with ASTM D4956. Along two-way roadways the sheeting will be on both sides of the delineators and guardrail posts and will 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 will be attached to the post nearest the bridge.

At bridges with guardrail less than 200 feet in length, a minimum of 4 delineators will be placed in addition to the end terminal yellow object marker. The spacing between the delineators will 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 (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will 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 will be placed in addition to the end terminal yellow object markers. The spacing between the delineators will 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 (low tension), the delineators will be placed at a spacing of approximately 50 feet. Delineation will 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 will 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 will be incidental to the respective high tension cable guardrail contract item.

An adhesive object marker will 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 will be fluorescent yellow type XI sheeting in conformance with ASTM D4956. All costs for furnishing and installing the adhesive object marker will be incidental to various contract items.

A type 2 object marker will be placed adjacent to the 3 cable guardrail (low tension) 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") will 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 will 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.

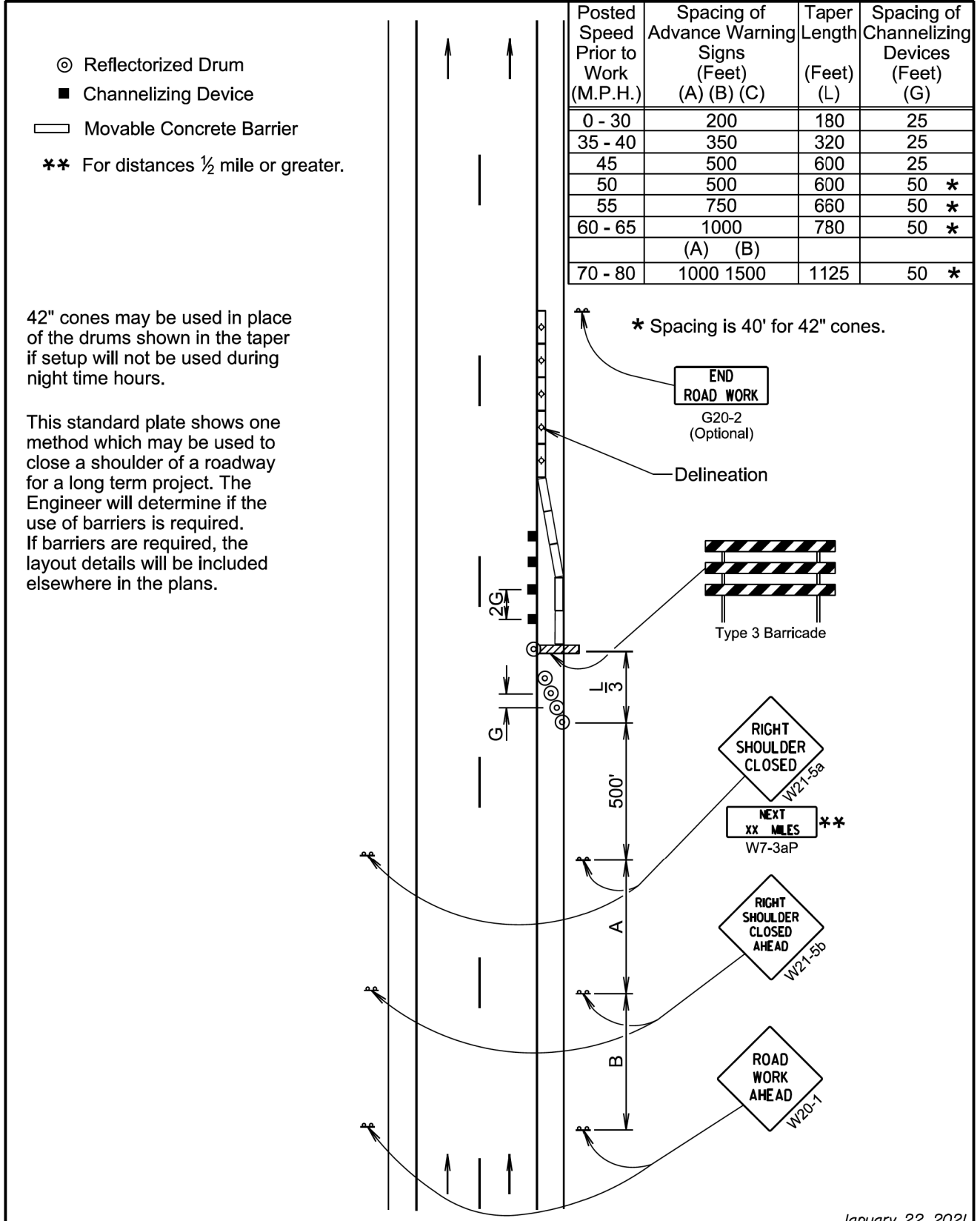
December 23, 2019

Published Date: 1st Qtr. 2023	S D D O T	DELINEATION OF GUARDRAIL	PLATE NUMBER 632.40
			Sheet 4 of 4

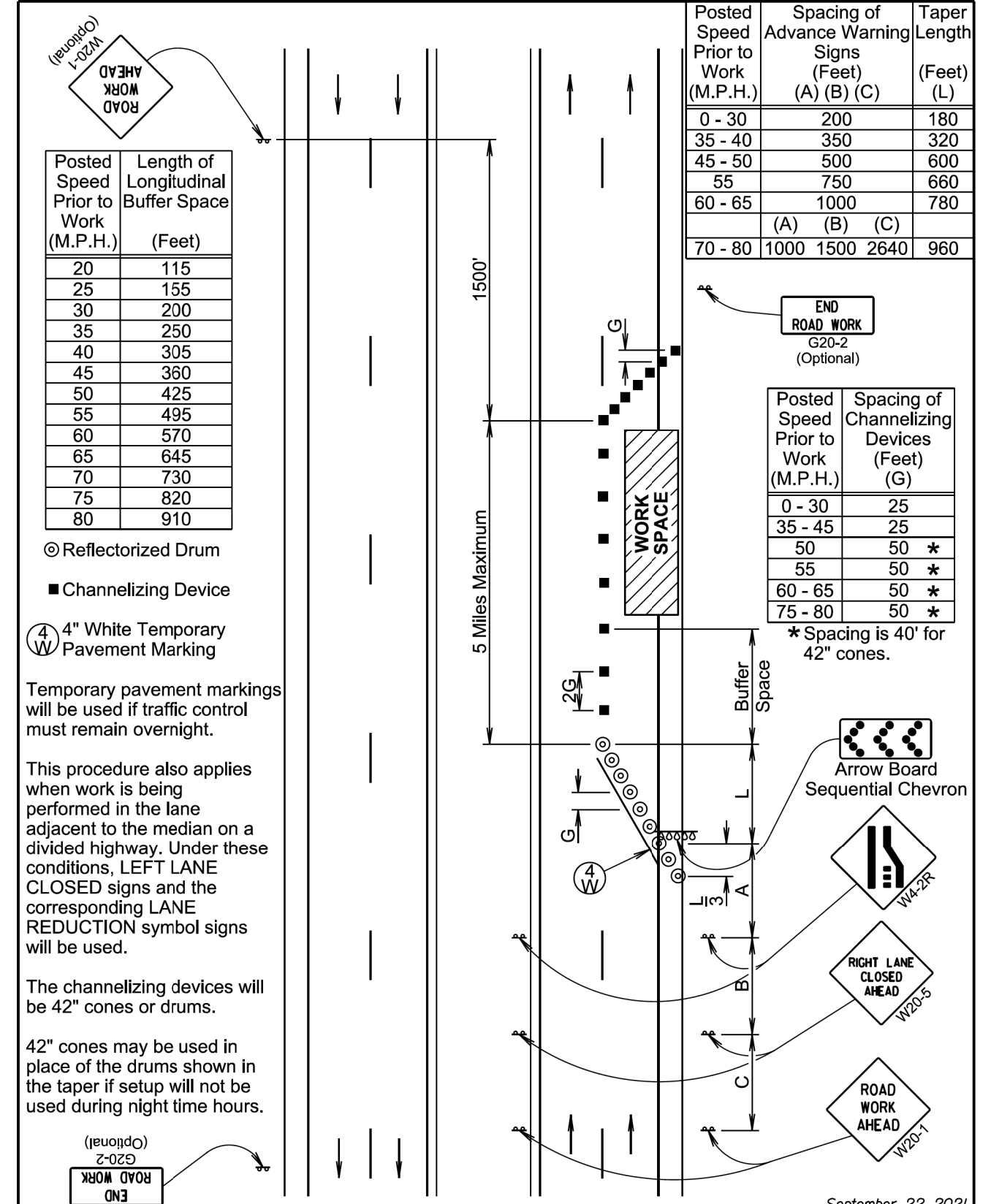
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File - ...174E_NonSectionMethod_Revision.dgn

Plot Scale - 1:200



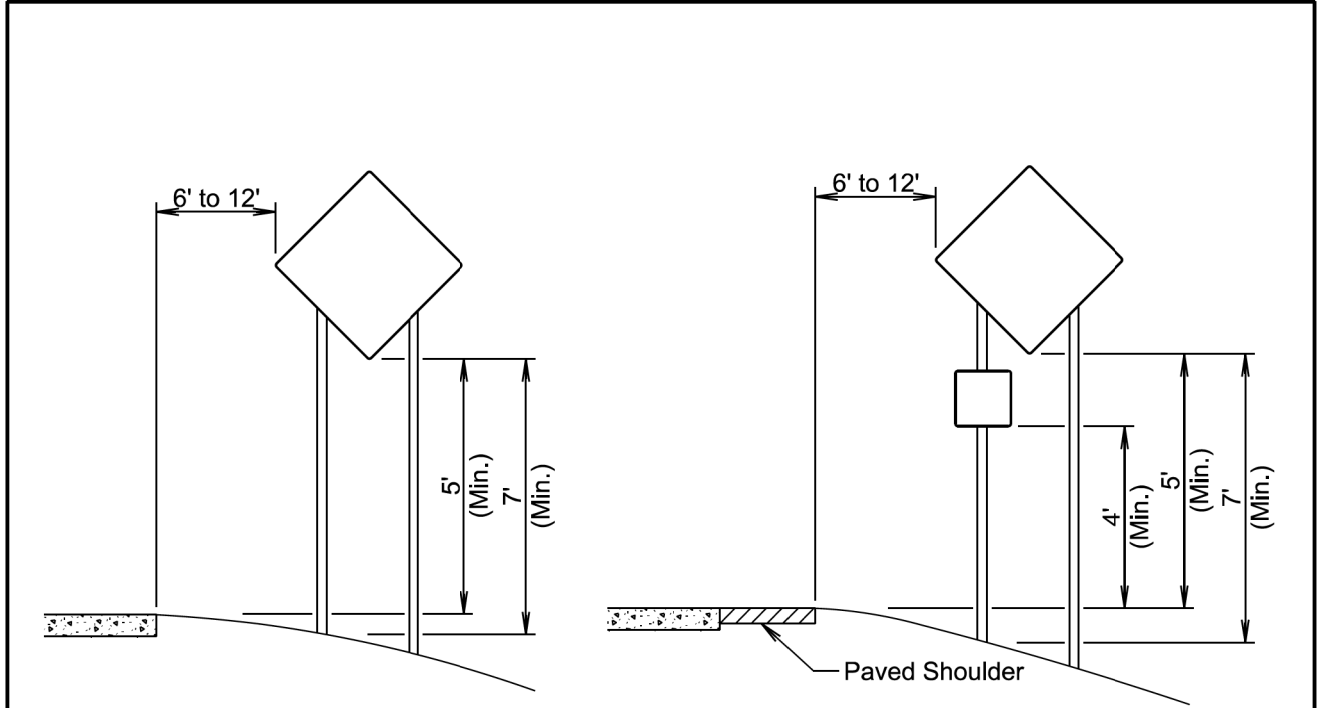
SDDOT	SHOULDER CLOSED	PLATE NUMBER 634.61
	Published Date: 1st Qtr. 2023	Sheet 1 of 1



SDDOT	LANE CLOSURE WITHOUT BARRIER	PLATE NUMBER 634.64
	Published Date: 1st Qtr. 2023	Sheet 1 of 1

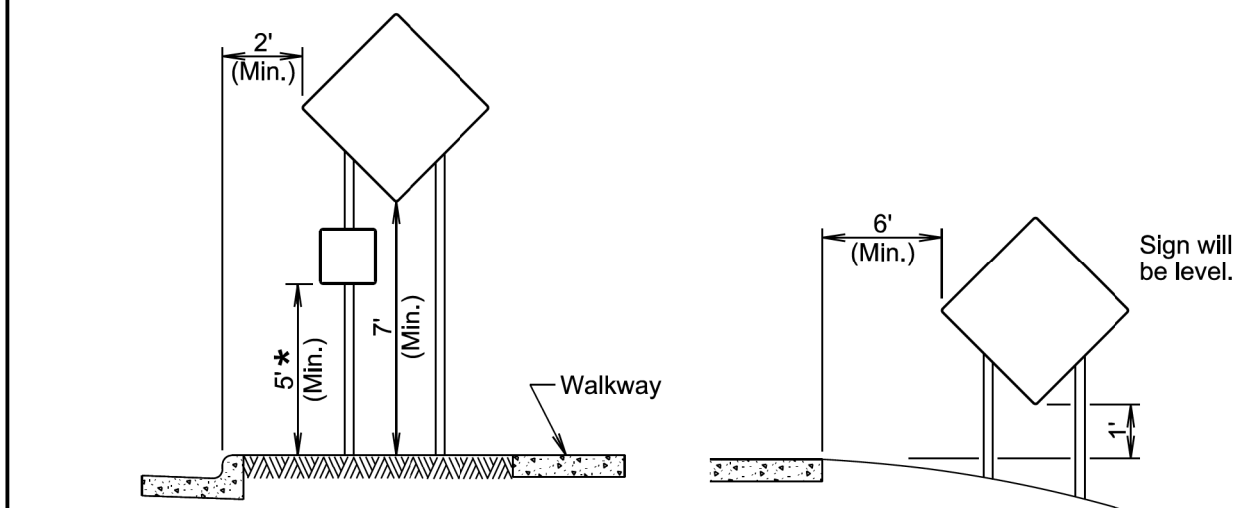
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Plot Scale - 1:200



RURAL DISTRICT

RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

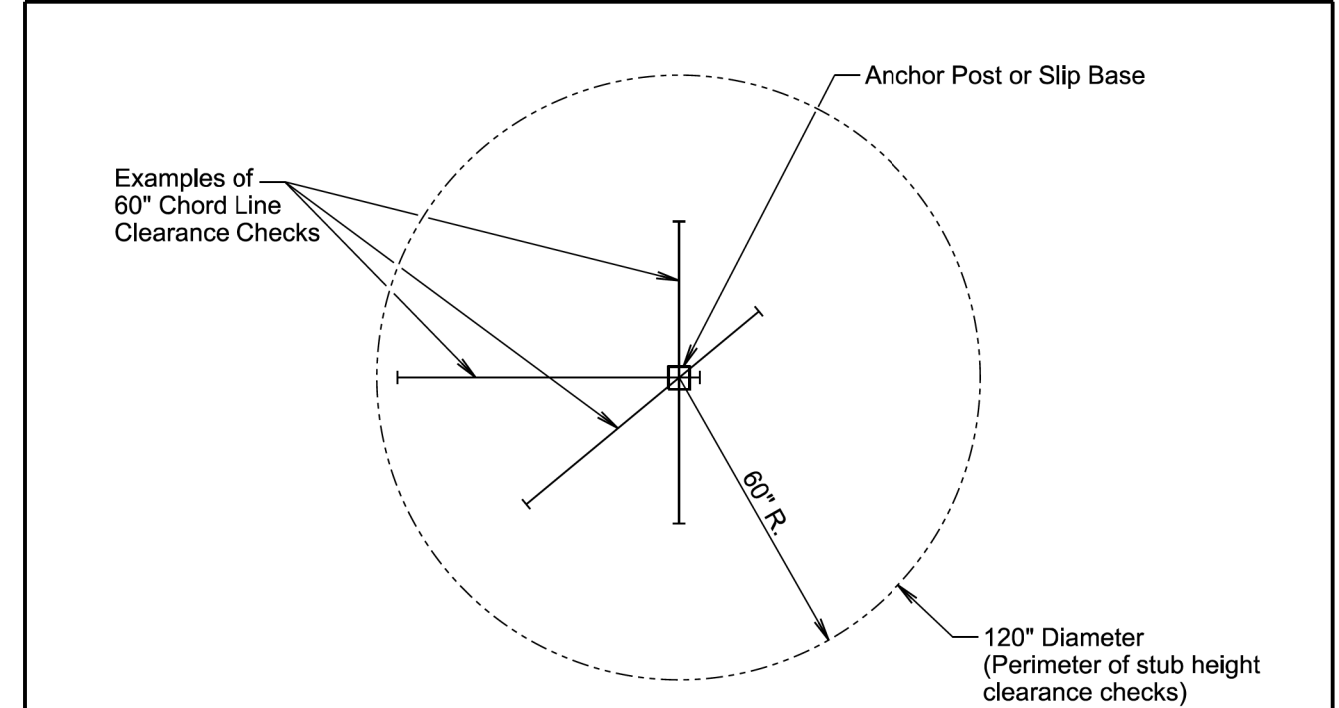
RURAL DISTRICT 3 DAY MAXIMUM

(Not applicable to regulatory signs)

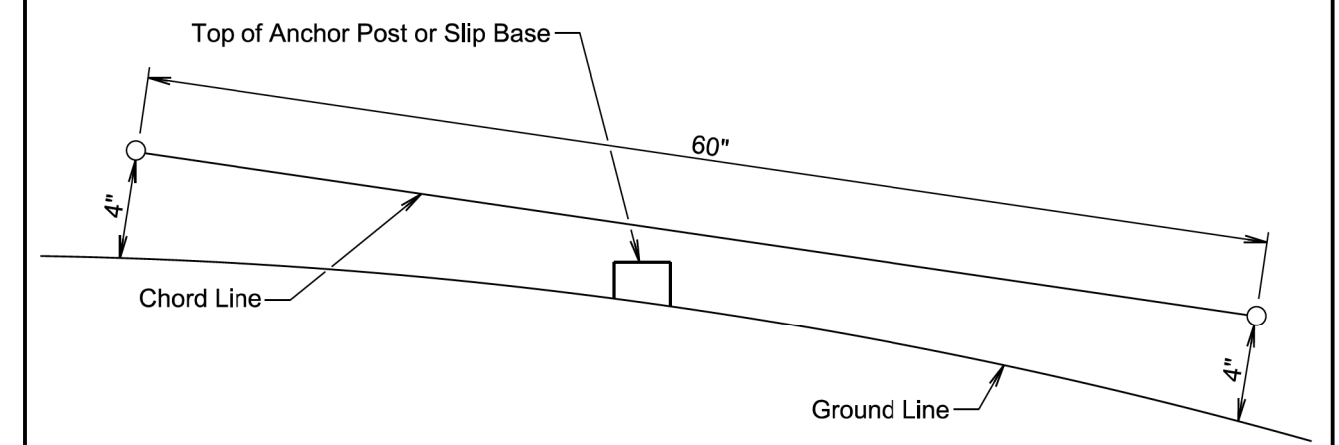
* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.

January 22, 2021

Published Date: 1st Qtr. 2023	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 WILL 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 will 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.

January 22, 2021

Published Date: 1st Qtr. 2023	S D D O T	BREAKAWAY SUPPORT STUB CLEARANCE	PLATE NUMBER 634.99
			Sheet 1 of 1

- Plotted From - TRW11NT35

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