

**STORM WATER PERMIT**  
(None Required)

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru

**ESTIMATE OF QUANTITIES**

<b>Bid Item Number</b>	<b>Item</b>	<b>Quantity</b>	<b>Unit</b>
009E0197	Mobilization 1- East of Murdo	5	EACH
009E0198	Mobilization 2 - West of Murdo	4	EACH
110E0700	Remove 3 Cable Guardrail	200	FT
110E0730	Remove Beam Guardrail	300	FT
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	1	EACH
110E0790	Remove W Beam Guardrail Deformed End	1	EACH
110E0800	Remove W Beam Guardrail End Terminal	1	EACH
110E6230	Remove W Beam Guardrail For Reset	25	FT
120E0600	Contractor Furnished Borrow	25	CUYD
260E1100	Base Course, State Furnished	25	CUYD
320E1902	State Furnished Asphalt Concrete Cold Mix	25	CUYD
629E0100	3 Cable Guardrail	150	FT
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	1	EACH
629E0400	3 Cable Guardrail Anchor Assembly	1	EACH
629E1000	Repair 3 Cable Guardrail	3750	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
629E1116	Steel Turn Buckle Cable End Assembly	3	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
630E0200	Straight Class A Thrie Beam Rail	100	FT
630E0210	Straight Class B Thrie Beam Rail	50	FT
630E1200	Straight Class A W Beam Rail	175	FT
630E1210	Straight Class B W Beam Rail	100	FT
630E2000	W Beam to Thrie Beam Guardrail Transition	2	EACH
630E2010	W Beam Guardrail End Terminal	1	EACH
630E2030	W Beam Guardrail Breakaway Cable Terminal	1	EACH
630E2110	Beam Guardrail Post & Block	60	EACH
630E2120	Beam Guardrail Post & Block, Winter	15	EACH
630E2205	Breakaway Cable Terminal End Post	5	EACH
630E2210	Breakaway Cable Terminal End Rail	3	EACH
630E2215	W Beam Guardrail End Section Buffer	2	EACH
630E5160	Reset W Beam Rail	12.5	FT
630E5220	Reset Rubrail	12.5	FT
630E5520	Drive Down Beam Guardrail Post	10	EACH
630E5530	Remove & Reset Beam Guardrail Post & Block	10	EACH
630E5550	Reset Beam Guardrail Post & Block	15	EACH
634E0010	Flagging	5	Hour
634E0100	Traffic Control	1888	Unit
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Panel	1	EACH

## **SPECIFICATIONS**

Standard Specifications for Roads and Bridges, 2004 Edition and Required Provisions, Supplemental Specifications and or Special Provisions as included in the Proposal.

## **LOCATION**

Guardrail repair will be limited to the section of Interstate 90 located in the South Dakota Department of Transportation Winner Area. 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 successful bidder of any areas that are to be exempted from guardrail repair due to active construction projects. This information will detail the exemption limits from Mile Reference Marker to Mile Reference Marker and date to date that guardrail repair will not be conducted.

## **ESTIMATED QUANTITIES**

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

## **MOBILIZATION**

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

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

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

## **PROGRESS PAYMENTS**

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

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

## **UTILITIES**

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

### **GENERAL MAINTENANCE OF TRAFFIC**

The Contractor will maintain traffic in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), Section 4.4 and Section 634 of the Standard Specifications, and the details in these plans.

The Contractor shall designate an employee whose responsibility is the maintenance of traffic, 24 hours a day, 7 days a week. The name and phone number of person(s) shall be provided to the SD Department of Transportation (842-0810), SD Highway Patrol (Pierre State Radio 773-3536), Jackson County Sheriff Department (837-2285), Jones County Sheriff Department (669-7111) and Lyman County Sheriff Department (869-2267).

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

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

Work activities shall be conducted during daylight hours only. Traffic shall be returned to the normal driving lanes during non-working hours. Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line.

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

### **BASE COURSE, STATE FURNISHED**

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

Base Course, State Furnished will be available from the SDDOT maintenance unit sites located at Kadoka (Exit 150) and Reliance (Exit 250). This material can be used without testing.

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

All other requirements of the Standard Specifications for Base Course shall apply.

Furnish cost to the State for the Base Course, State Furnished is \$10.00 per ton. This project will use a conversion factor of 1.5 ton per cubic yard for this material.

### **STATE FURNISHED ASPHALT CONCRETE COLD MIX**

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

State Furnished Asphalt Concrete Cold Mix type material will be supplied by the SDDOT and will be available from the SDDOT maintenance unit site located at Murdo (Exit 192).

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

This material is royalty free to the Contractor.

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

### **RESTORATION OF DISTURBED AREAS**

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

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

### **CONTRACTOR FURNISHED BORROW**

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

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

## **WASTE DISPOSAL SITE**

The Contractor will be required to furnish a site(s) for the disposal of construction/demolition debris generated by this project.

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

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

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

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

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

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

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

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

## **HISTORICAL PRESERVATION OFFICE CLEARANCES**

To obtain State Historical Preservation Office (SHPO) clearance, a cultural resources survey may need to be conducted by a qualified archaeologist. In lieu of a cultural resources survey, the Contractor could request a records search from Jim Donohue, State Archaeological Research Center (SARC). Provide SARC 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 no artifacts have been found on the site. The Contractor shall arrange and pay for the cultural resource survey and/or records search.

### **HISTORICAL PRESERVATION OFFICE CLEARANCES (CONTINUED)**

If any earth disturbing activities occur within the current geographical or historic boundaries of any South Dakota reservation, the Contractor shall obtain Tribal Historical Preservation Office (THPO) clearance. If no THPO exists, the required SHPO clearance shall suffice, with documentation of Tribal contact efforts provided to SHPO.

To facilitate SHPO or THPO responses, the Contractor should submit a records search or cultural resources survey report to the DOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3268). Allow 30 days from the date this information is submitted to the Environmental Engineer for SHPO/THPO approval. The Contractor is responsible for obtaining all required permits and clearances for staging areas, borrow sites, waste disposal sites, and all material processing sites. The Contractor shall provide the required permits and clearances to the Engineer at the preconstruction meeting.

### **GUARDRAIL COMPLETION REQUIREMENTS**

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

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

If the Contractor fails to complete the required work within the time allowed, the Contractor will install an approved safety treatment that complies with NCHRP 350 level 3 to protect the site. Failure to comply with this requirement will necessitate liquidated damages being assessed at a rate of \$500 for each calendar day that the guardrail work remains incomplete for the item of concern. This provision applies up to the contract completion date. After the contract completion date, liquidated damages will be assessed in accordance with Section 8.7 or \$500, whichever is greater.

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

### **GUARDRAIL**

1. When guardrail adjoining bridge ends is ordered to be repaired, the contractor will replace with the same size and type as existing type of guardrail. Post spacing will be in accordance with current specifications. See Standard Plates 630.15, 630.20, 630.21, and 630.50 for post spacing requirements.
2. When the SDDOT instructs the Contractor to replace a W Beam guardrail end terminal, the new W Beam guardrail end terminal shall be of the same type (flared or tangent) that was originally installed. The costs for furnishing and installing the tangent and flared W Beam guardrail end terminals shall be incidental to the contract unit price per each for "W Beam Guardrail End Terminal". All W Beam guardrail end terminals that are replaced shall meet the requirements of NCHRP Report Number 350 Test Level 3 and shall be listed on the South Dakota Department of Transportation Approved Product List.

**GUARDRAIL (CONTINUED)**

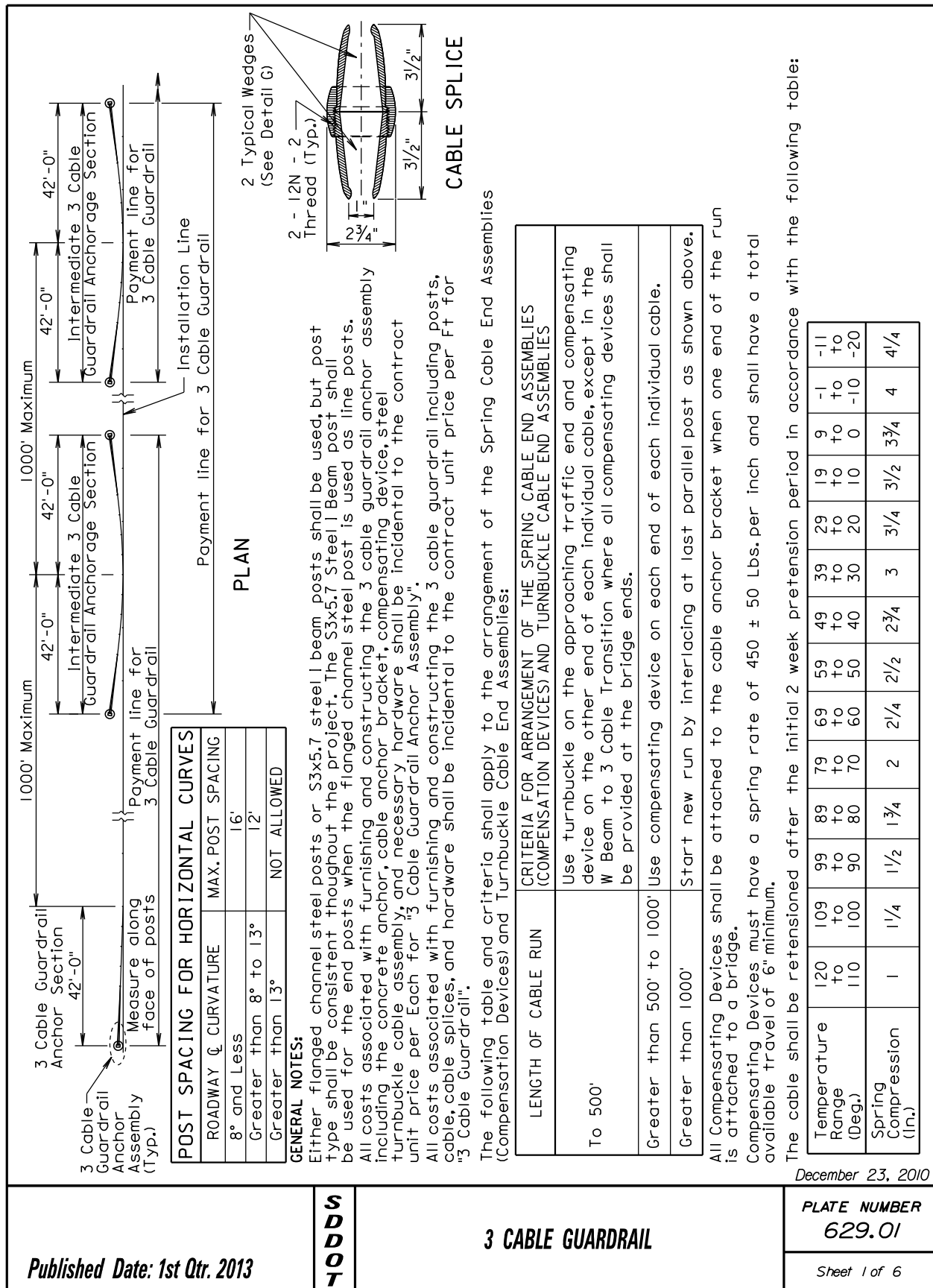
3. If the ground condition at the site is frozen or has large snow amounts, the portion of embankment and surfacing modification that does not affect guardrail installation or performance will be completed as soon as conditions permit, prior to contract completion date.
4. "Beam Guardrail Post and Block, Winter" is the additional cost for removal and installation of guardrail posts when there is in excess of one foot of solid frozen ground at the work site. This contract unit price will be an additional payment for each post installed under these conditions.
5. "3 Cable Guardrail Post, Winter" is the additional cost for removal and installation of a 3 Cable Guardrail Post (I Beam or Flanged Channel) when there is in excess of one foot solid frozen ground at the work site. This contract unit price will be an additional payment for each post installed under these conditions.
6. "Remove and Reset Beam Guardrail Post & Block" includes removal of wood guardrail post and block and resetting it to proper alignment with the Beam Guardrail. Payment for this work will be the same in frozen or unfrozen ground.
7. "Repair 3 Cable Guardrail" includes the cost for replacing and repairing damaged cable, realigning posts, and the tensioning of the entire run of three cable guardrail. Payment for this item is applicable only when broken cable is repaired or the existing cable rail requires realigning and retensioning.
8. "3 Cable Guardrail Intermediate Post" includes the cost for both I Beam and Flanged type of posts. The post for this item shall be furnished and installed consistent with the type of posts presently in place at the proposed repair site.
9. "Beam Guardrail Post and Block" shall include the appropriate size wood block. The Engineer shall designate the proper post length of six, six and one-half, or seven feet as needed to fit the repair situation.
10. The Contractor may be required to furnish some items that are not listed in the Contract Proposal. The Contractor shall furnish the invoice and will be paid invoice cost plus shipping, handling, taxes and 10 percent for profit. The Contractor is required to receive prior approval of the Engineer before making these purchases. Installation cost for these additional items shall be incidental to the contract unit prices for the various items. Cost to remove and dispose of damaged guardrail items shall be incidental to the contract unit prices for the various items. The Contractor and Engineer shall negotiate installation costs for added items which vary significantly from contract bid items.
11. The Contractor shall place "State Furnished Asphalt Concrete Cold Mix" around the posts to fill and level any voids created by the driving of the posts through the asphalt. This material will be available at the SDDOT maintenance sites located at the Murdo DOT Maintenance Yard. The material shall be placed ½" high around the post to force the water to drain away from the post. Cost for this work shall be incidental to the contract unit prices for the various guardrail items.
12. The Contractor shall notify the Winner Area Engineer or designated representative if any guardrail delineation is damaged which cannot be repaired by bolting/riveting to new posts or guardrail installed by Contractor as part of repair. The new delineation items will be installed by SDDOT Maintenance forces. See Standard Plate 632.40 for guardrail delineation requirements.

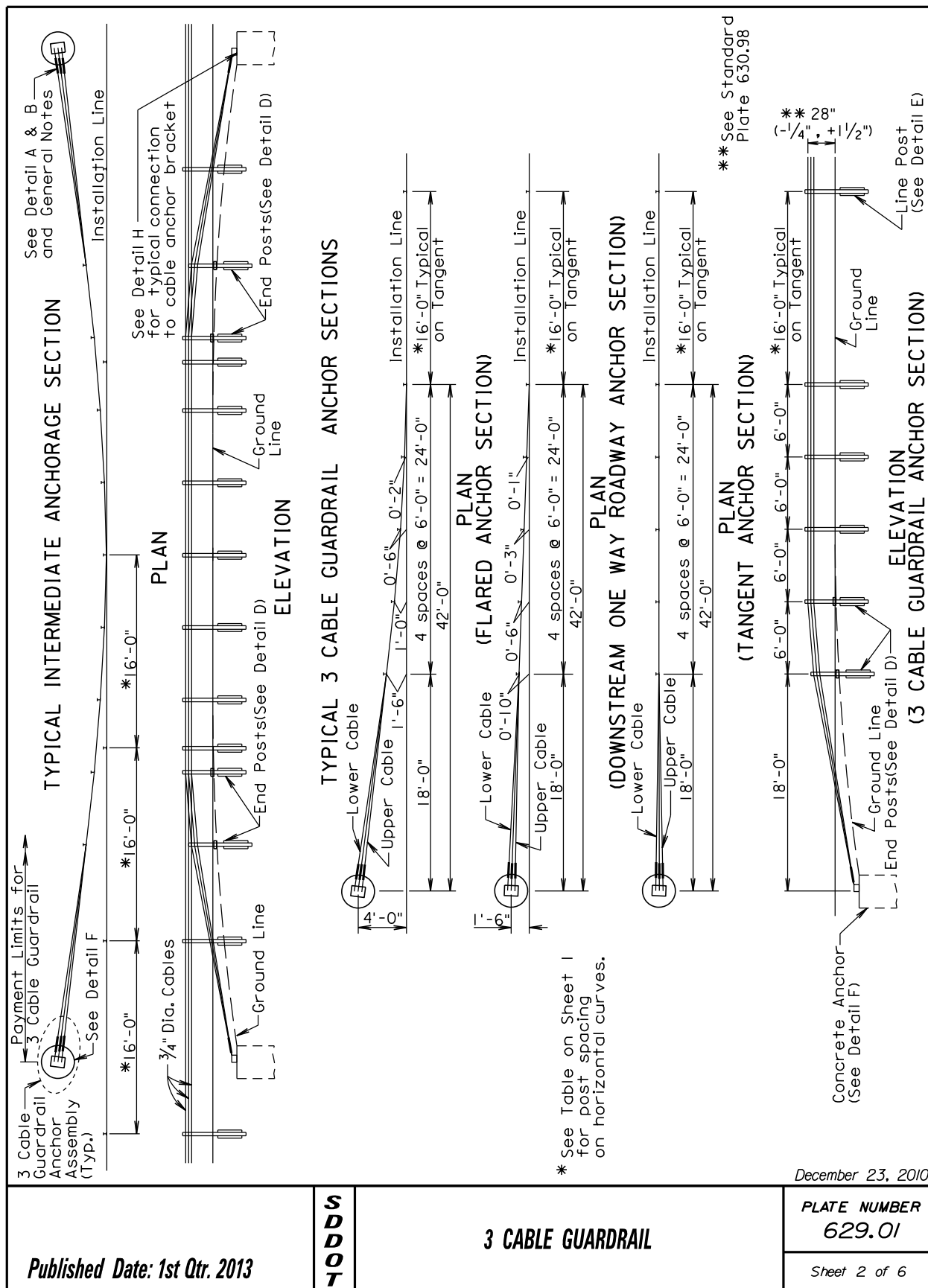


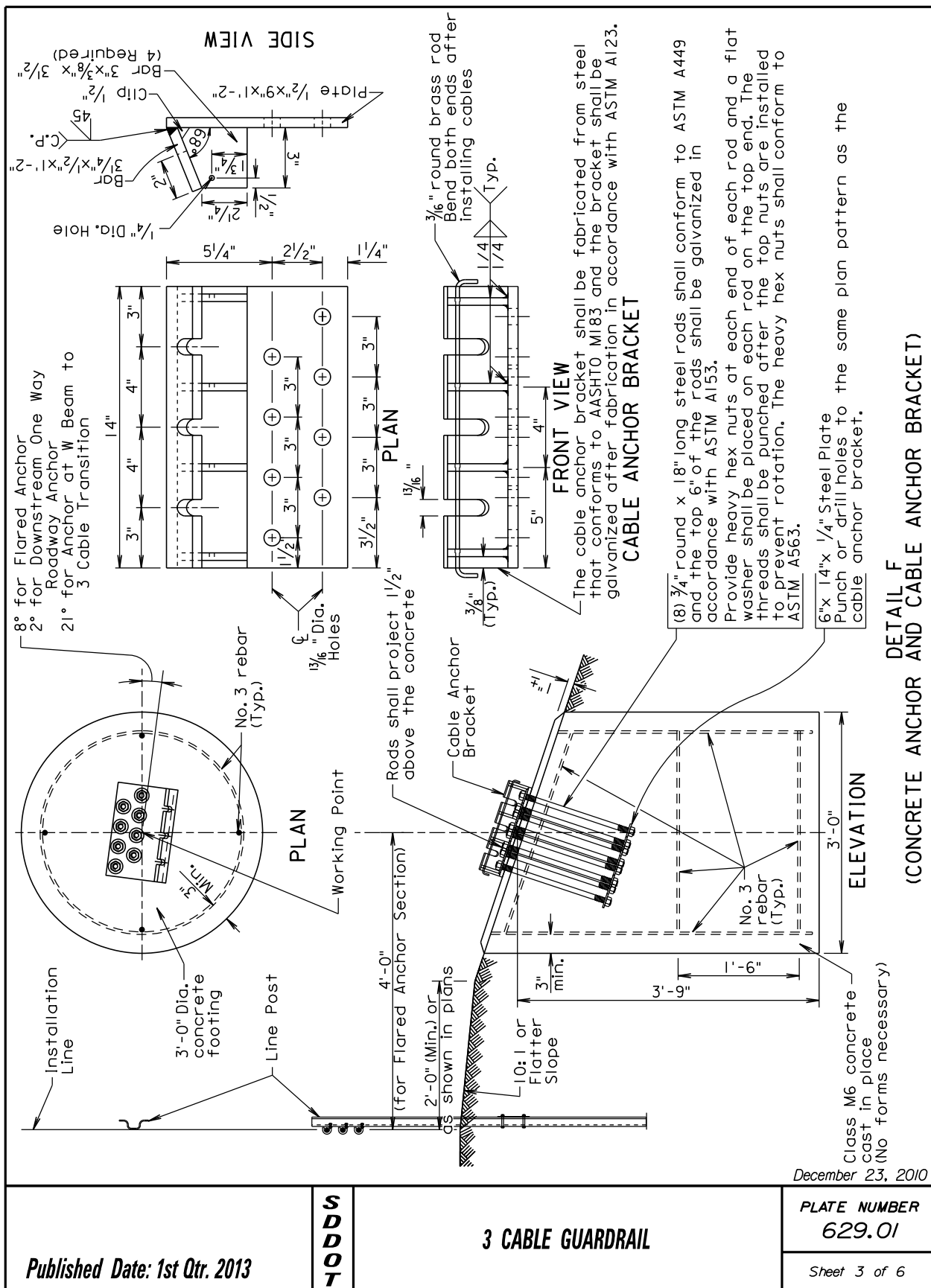
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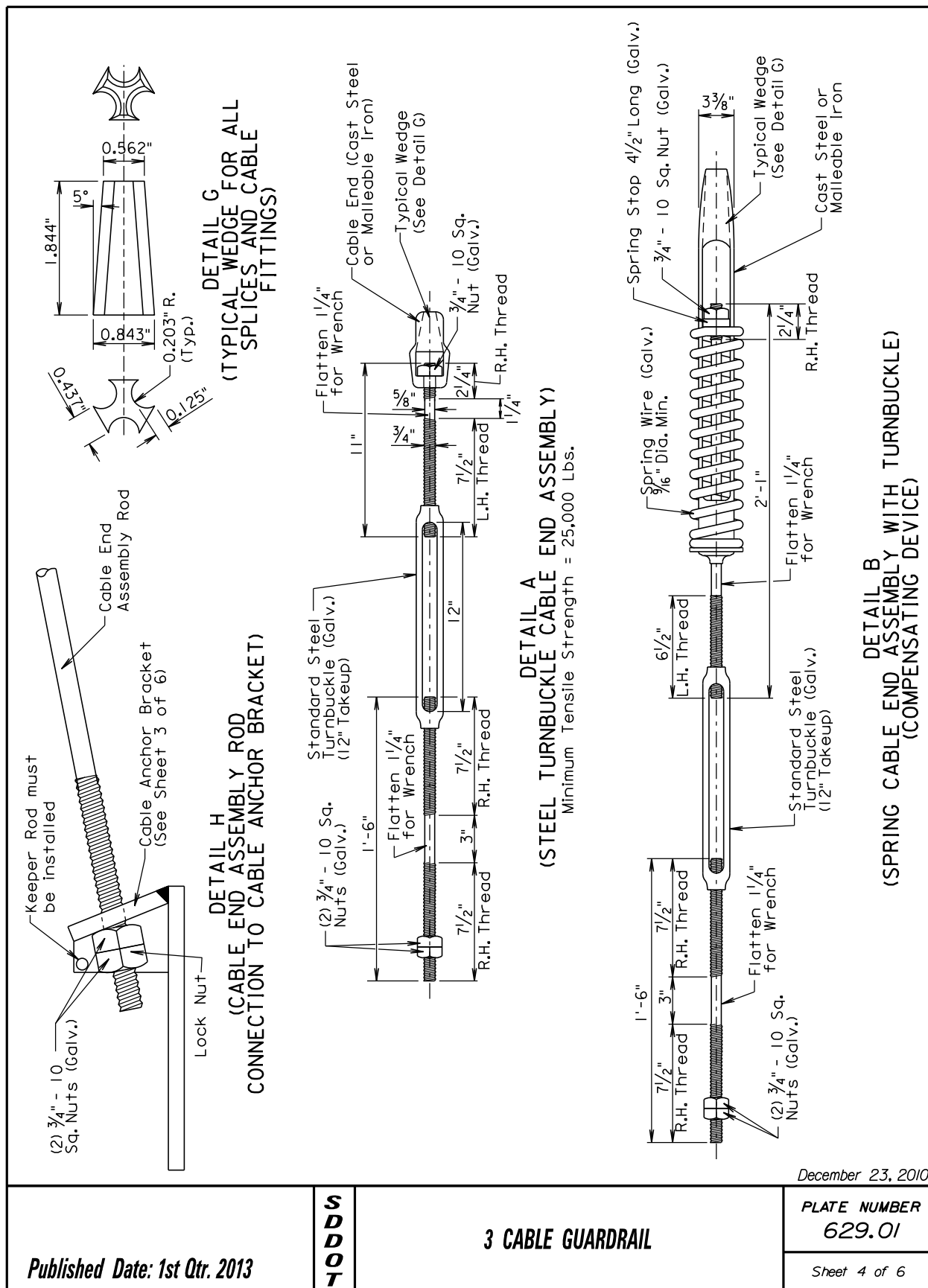
**ITEMIZED LIST FOR TRAFFIC CONTROL**

SIGN CODE	SIGN SIZE	DESCRIPTION	NUMBER REQUIRED	UNITS PER SIGN	UNITS
G20-1	48" x 24"	ROAD WORK NEXT ## MILES	0	24	24
G20-2A	48" x 24"	END ROAD WORK	1	24	
R1-1	48" x 48"	STOP	0	34	
R1-2	48" x 48"	YIELD	0	34	
R1-2a	48" x 24"	TO ONCOMING TRAFFIC	0	24	
R2-1	30" x 36"	SPEED LIMIT ##	0	23	
R2-5C	30" x 36"	SPEED ZONE AHEAD	0	23	
R4-1	24" x 30"	DO NOT PASS	0	18	
R4-2	24" x 30"	PASS WITH CARE	0	18	
R4-7	24" x 30"	KEEP RIGHT (SYMBOL)	0	18	
R4-8	24" x 30"	KEEP LEFT (SYMBOL)	0	18	68
R10-6	24" x 36"	STOP HERE ON RED	0	20	
R11-2	48" x 30"	ROAD CLOSED	0	27	
SW12-1B	120" x 60"	HIGHWAY WORKERS GIVE 'EM A BRAKE	0	80	
W1-6	48" x 24"	LARGE ARROW	0	24	
W1-7	48" x 24"	LARGE ARROW - HORZ. DOUBLE HEAD	0	24	
W3-1	48" x 48"	STOP AHEAD (SYMBOL)	0	34	
W3-2	48" x 48"	YIELD AHEAD (SYMBOL)	0	34	
W4-1	48" x 48"	MERGE (SYMBOL)	0	34	
W4-2	48" x 48"	LEFT OR RIGHT LANE ENDS (SYMBOL)	2	34	
W6-3	48" x 48"	TWO WAY TRAFFIC (SYMBOL)	0	34	68
W7-3a	30" x 24"	NEXT ## MILES	0	18	
W8-1	36" x 36"	BUMP	0	27	
W8-6	48" x 48"	TRUCK CROSSING	0	34	
W8-7	36" x 36"	LOOSE GRAVEL	0	27	
W8-7A	36" x 36"	WINDROW	0	27	
W8-9a	48" x 48"	SHOULDER DROP-OFF	0	34	
W8-11	48" x 48"	UNEVEN LANES	0	34	
W12-1	36" x 36"	DOUBLE ARROW	0	27	
W13-1	24" x 24"	ADVISORY SPEED PLATE	0	16	
W20-1	48" x 48"	ROAD WORK ##### FT. OR AHEAD	2	34	68
W20-2	48" x 48"	DETOUR ##### FT. OR AHEAD	0	34	
W20-3	48" x 48"	ROAD CLOSED ##### FT. OR AHEAD	0	34	
W20-4	48" x 48"	ONE LANE ROAD ##### FT. OR AHEAD	0	34	
W20-5	48" x 48"	LT. OR RT. LANE CLOSED ##### FT. OR AHEAD	2	34	
W20-7a	48" x 48"	FLAGGER	2	34	
W20-7b	48" x 48"	BE PREPARED TO STOP (also shown as W3-4)	0	34	
W21-1a	48" x 48"	WORKERS (SYMBOL)	0	34	
W21-2	36" x 36"	FRESH OIL	0	27	
W21-3	48" x 48"	ROAD MACHINERY AHEAD	0	34	68
W21-5	48" x 48"	SHOULDER WORK	0	34	
W21-5a	48" x 48"	RIGHT SHOULDER CLOSED	2	34	
W21-5b	48" x 48"	RIGHT SHOULDER CLOSED AHEAD	2	34	
*****	12" x 36"	TYPE III OBJECT MARKER	0	14	
*****	*****	TYPE III BARRICADE - 6 FT. SINGLE SIDED	0	30	
*****	*****	TYPE III BARRICADE - 8 FT. SINGLE SIDED	1	40	
*****	*****	TYPE III BARRICADE - 6 FT. DOUBLE SIDED	0	42	
*****	*****	TYPE III BARRICADE - 8 FT. DOUBLE SIDED	0	56	
<b>TOTAL UNITS</b>					<b>472</b>









December 23, 2010

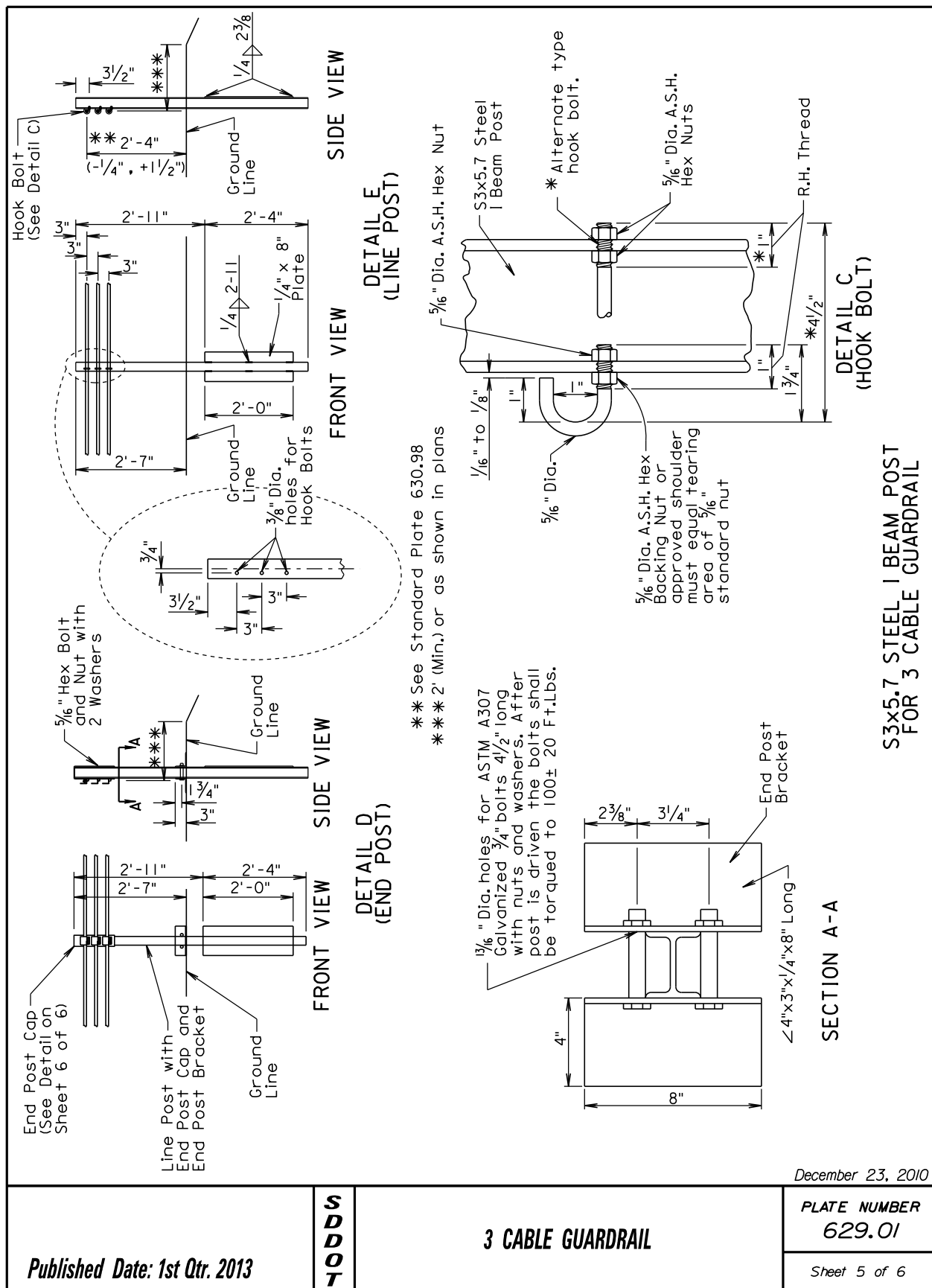
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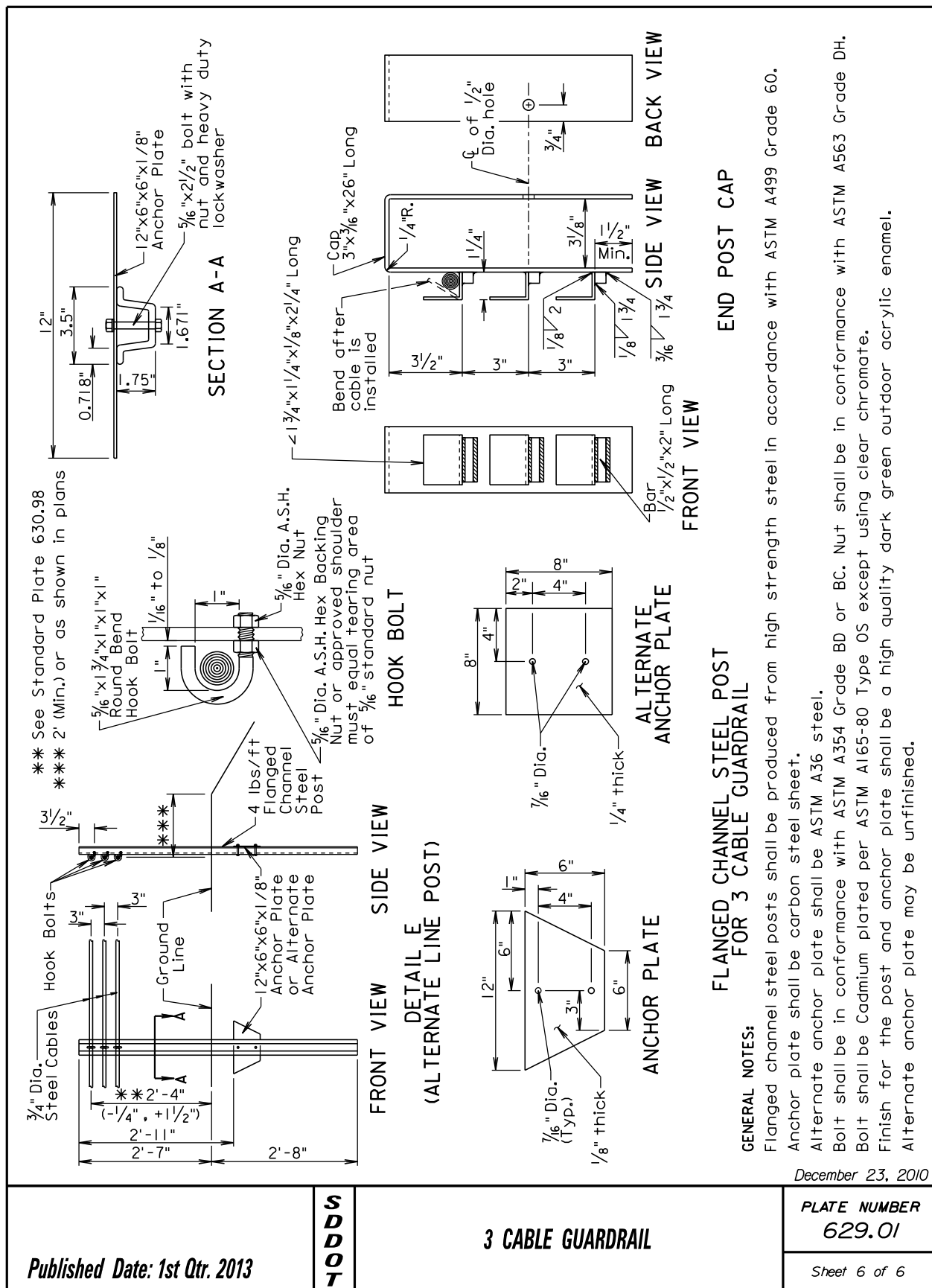
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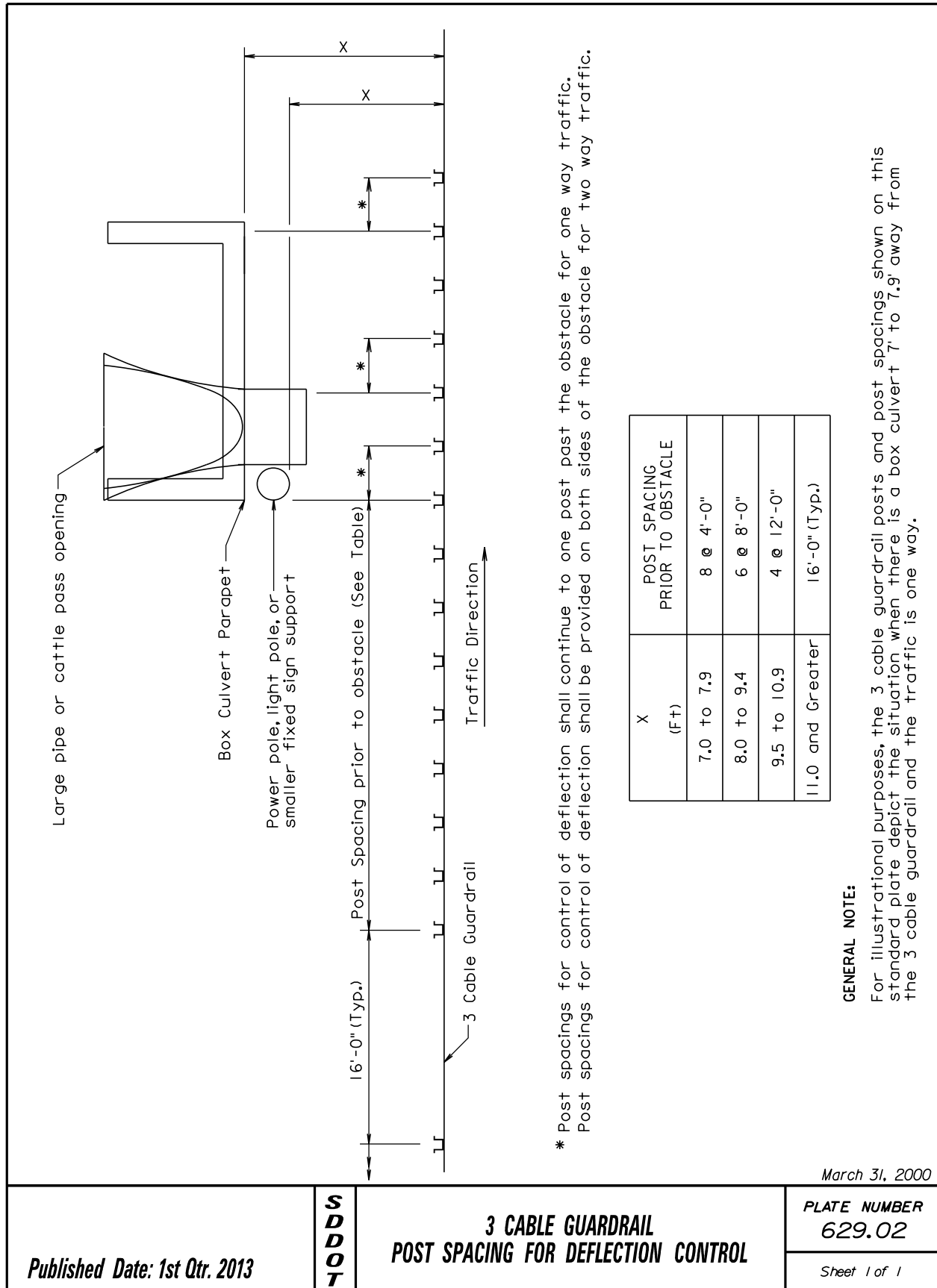
3 CABLE GUARDRAIL

PLATE NUMBER  
 629.01

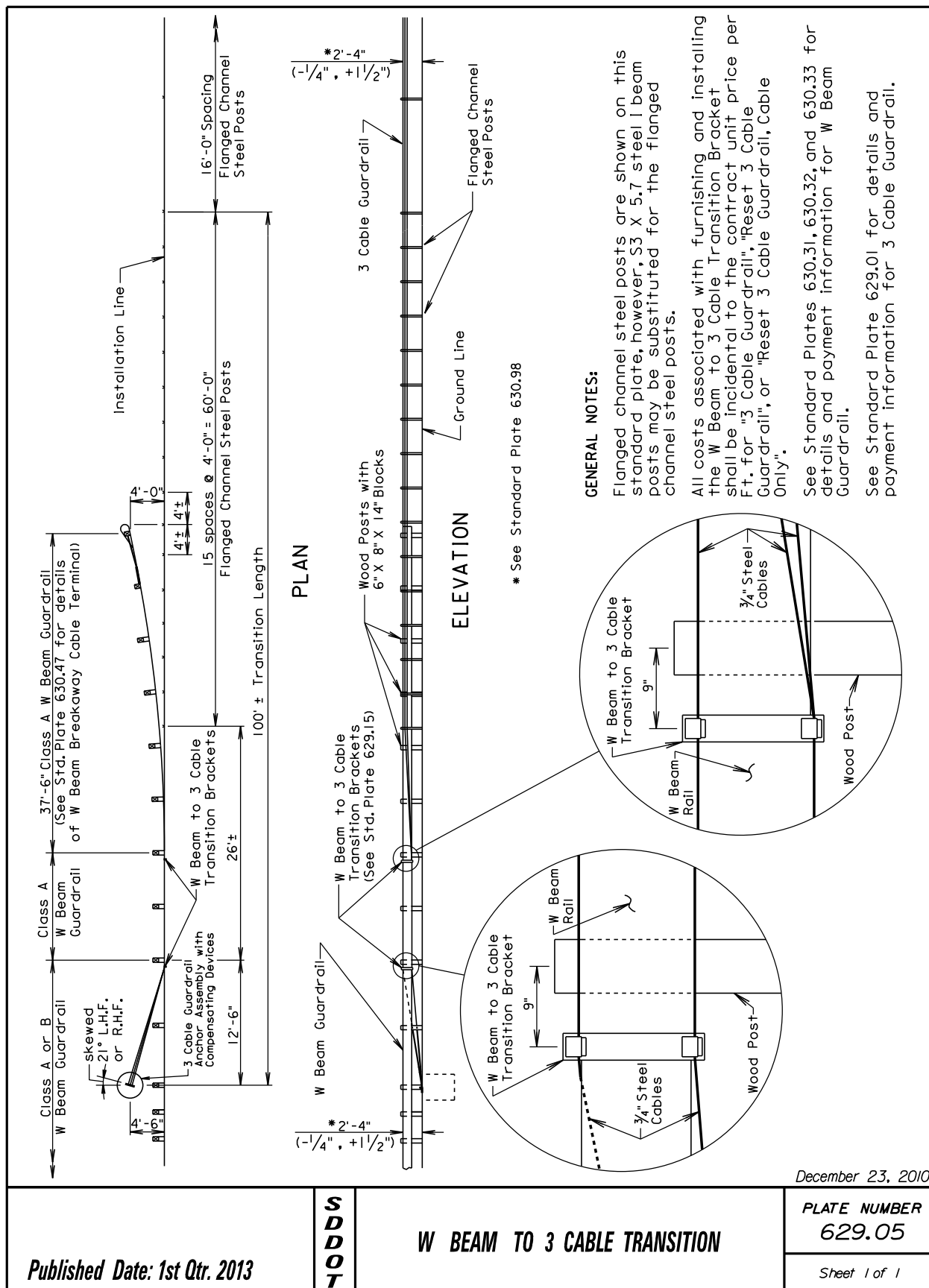
Sheet 4 of 6

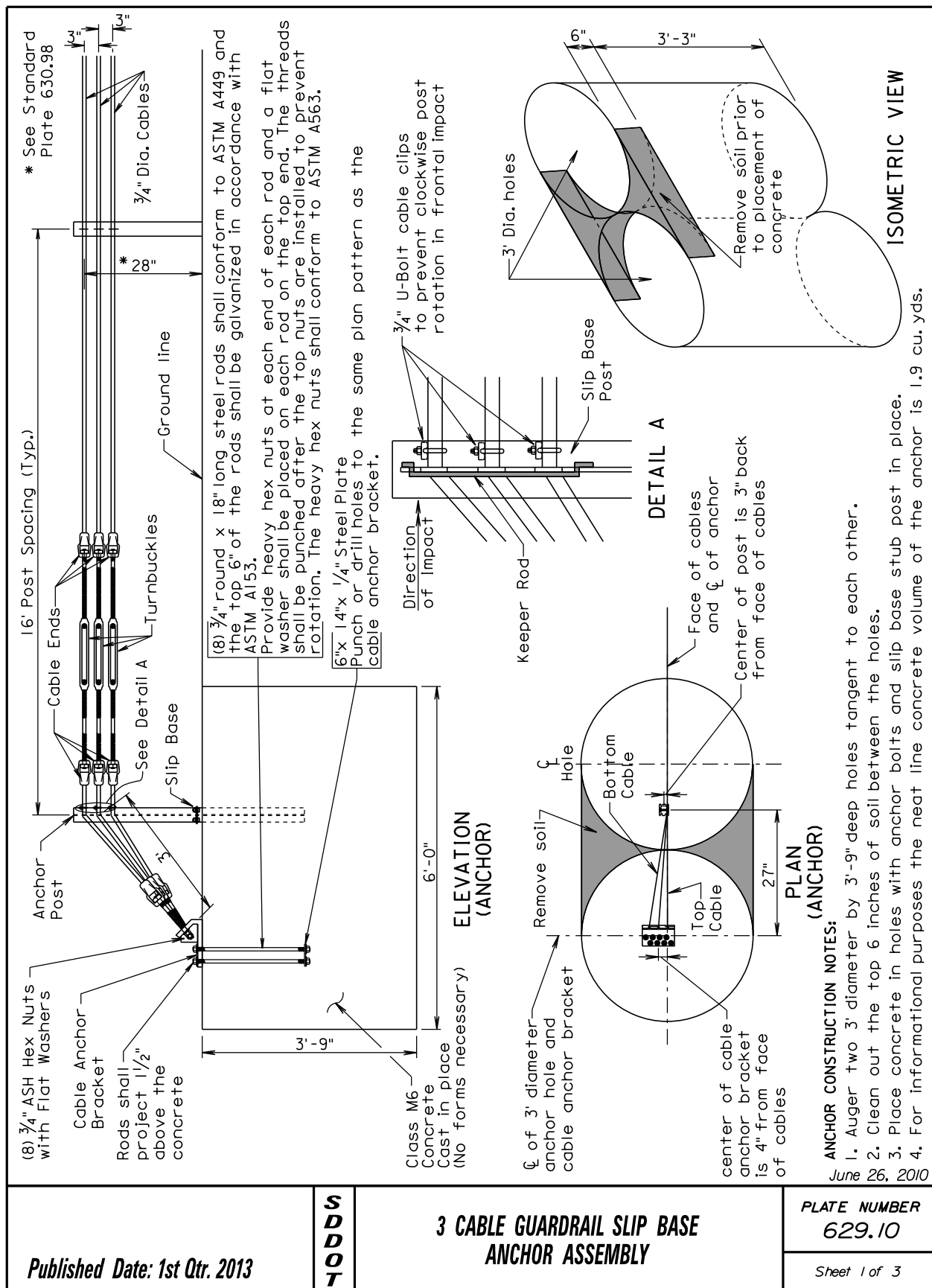


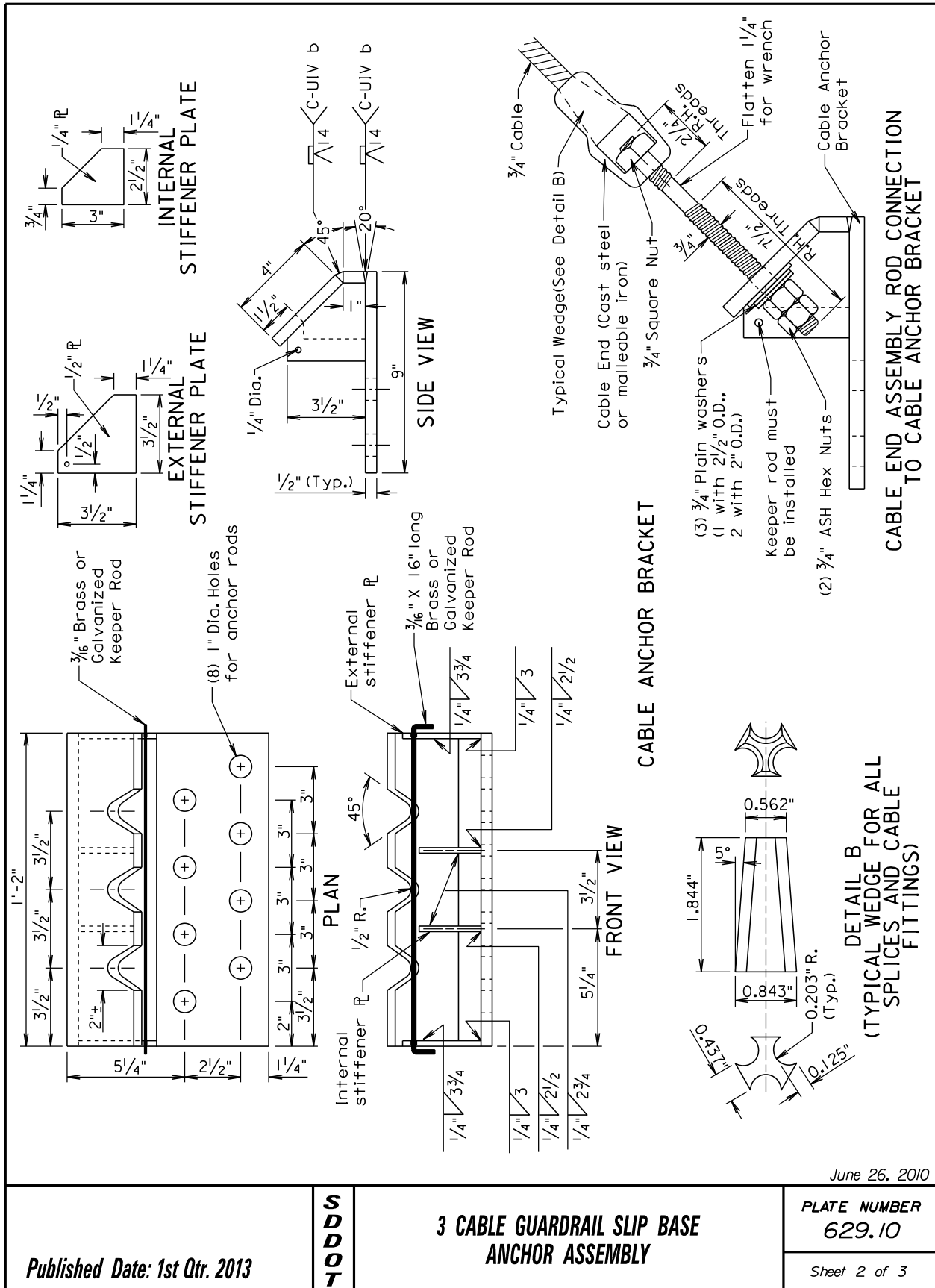




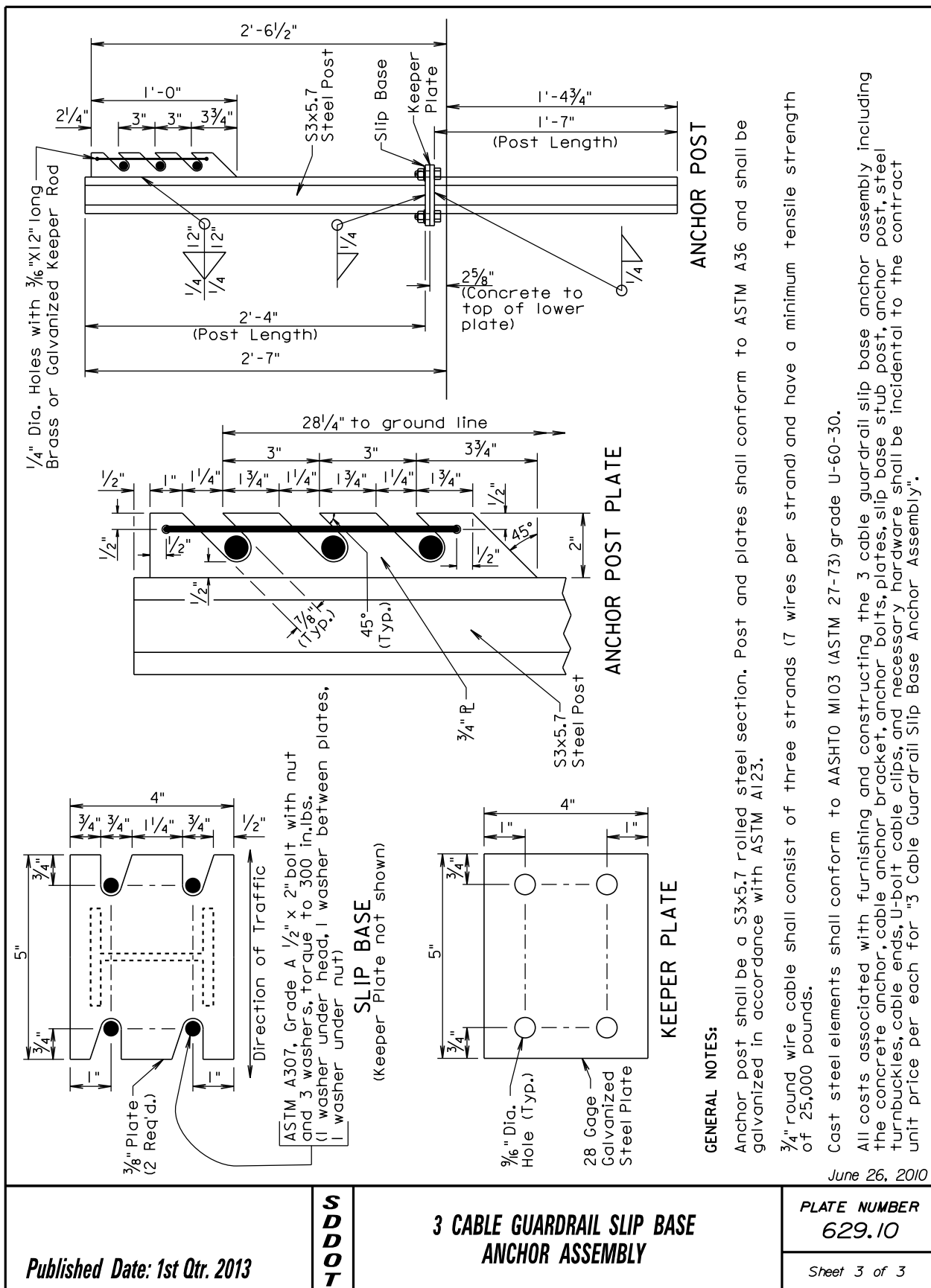


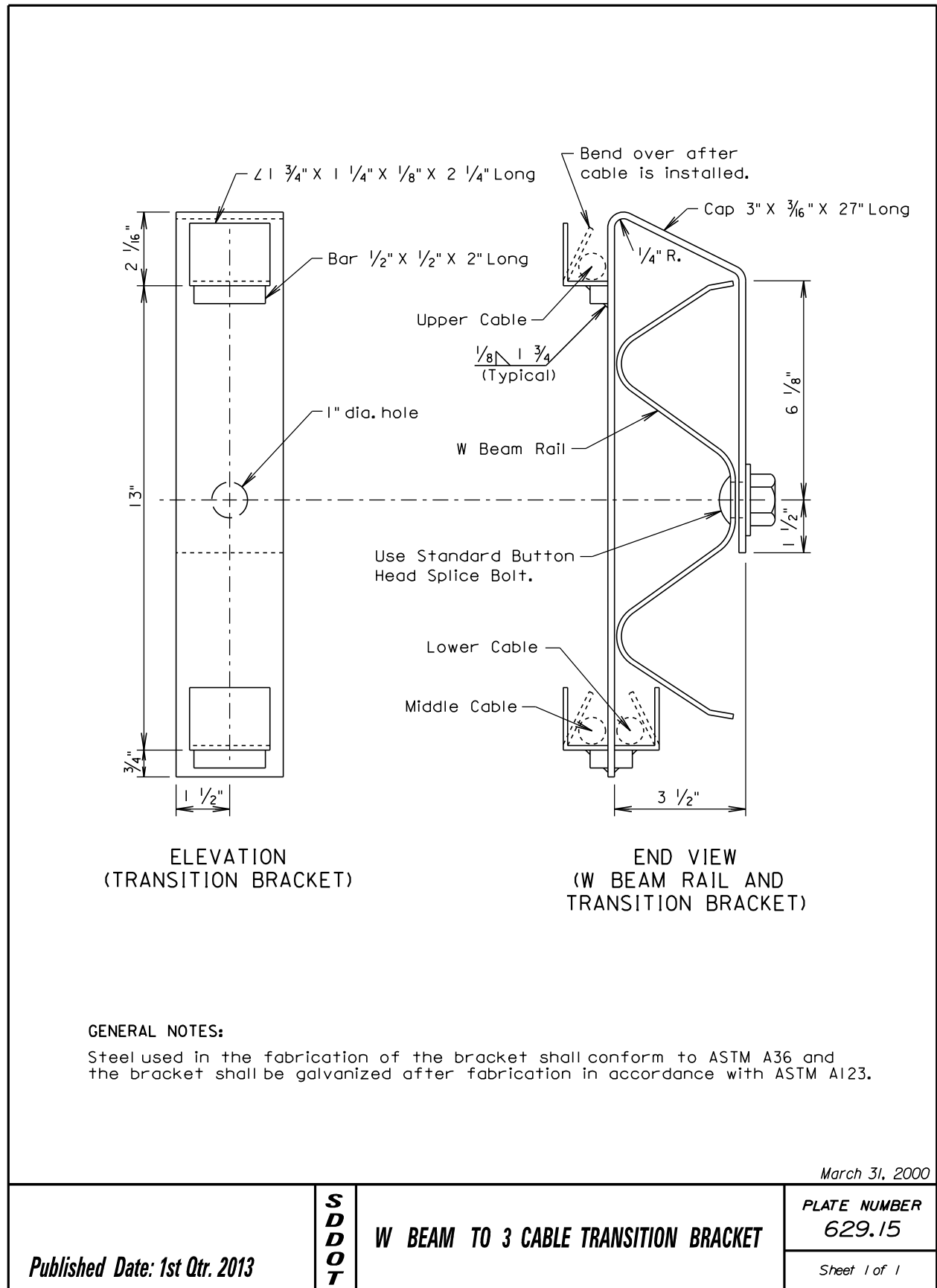




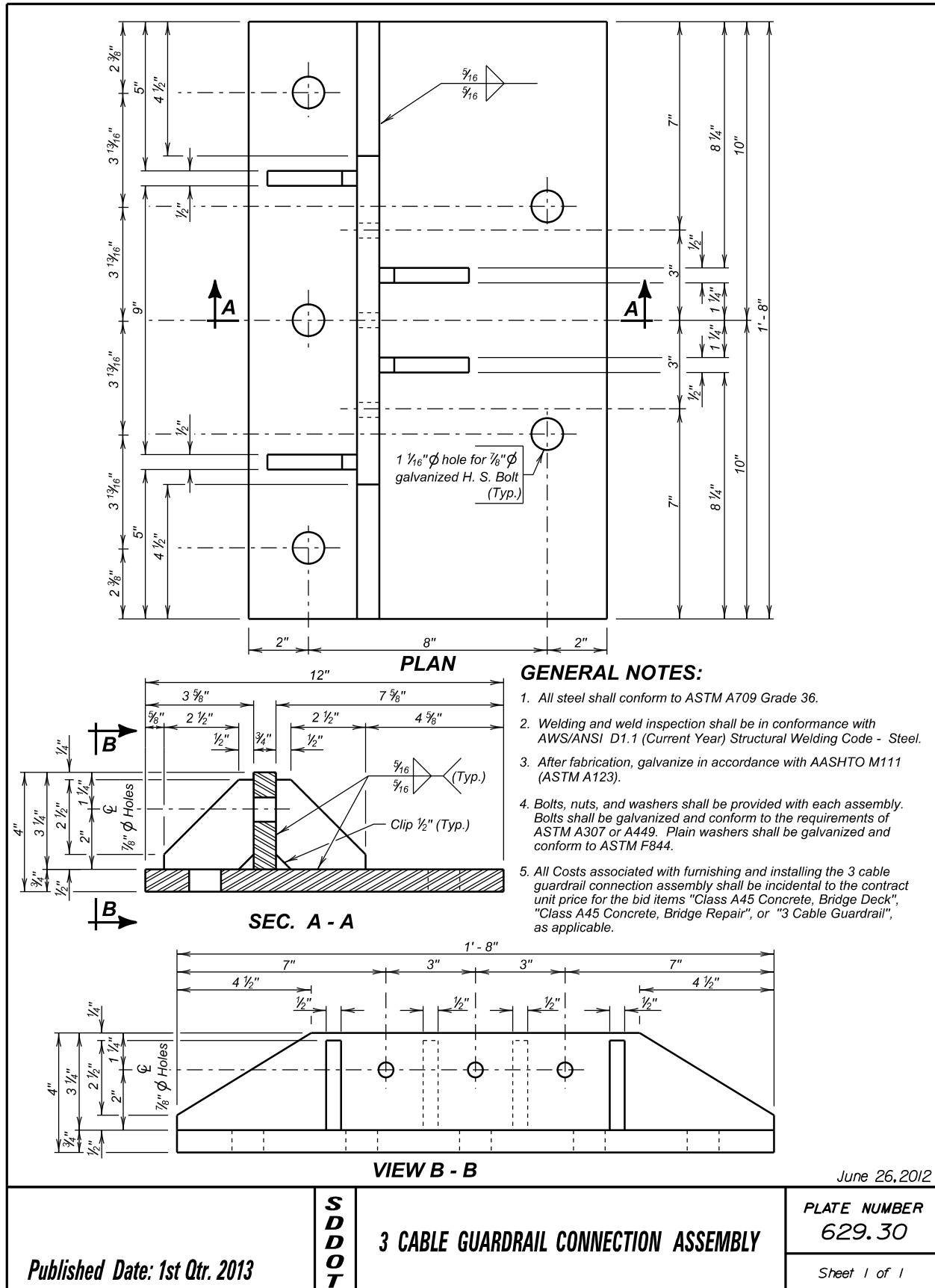


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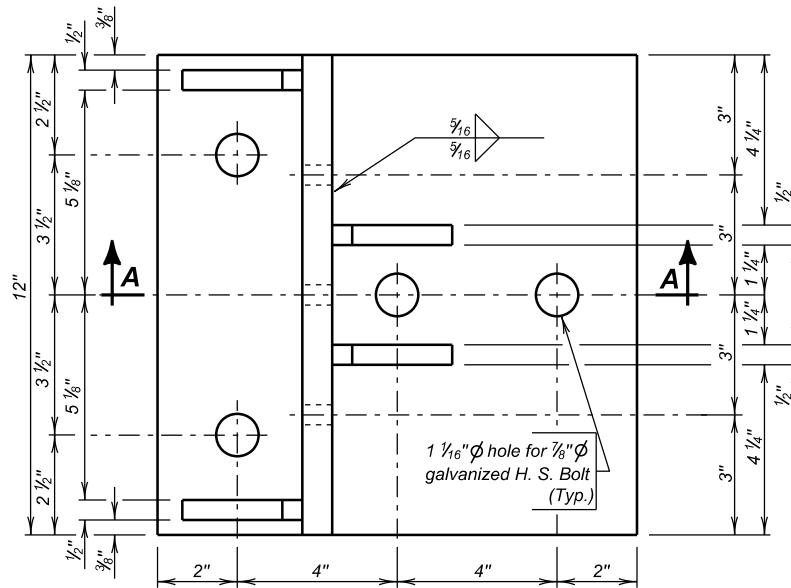




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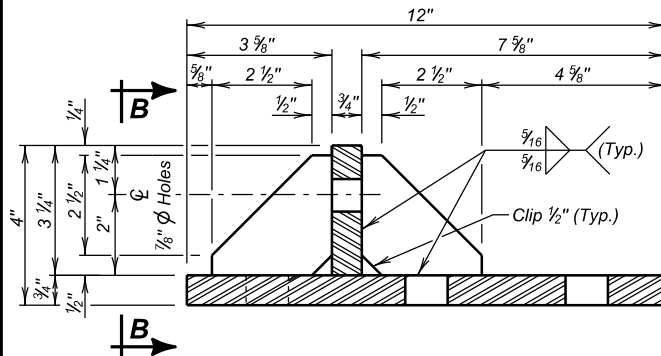
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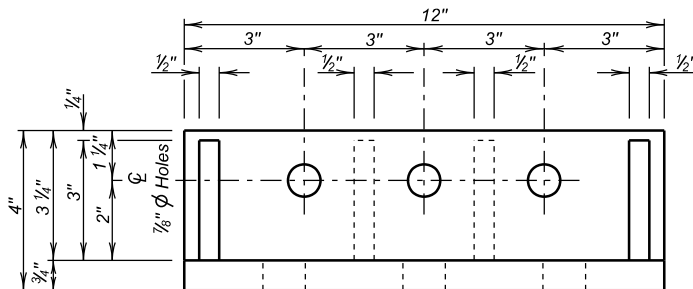
**PLAN**

**GENERAL NOTES:**

1. All steel shall conform to ASTM A709 Grade 36.
2. Welding and weld inspection shall be in conformance with AWS/ANSI D1.1 (Current Year) Structural Welding Code - Steel.
3. After fabrication, galvanize in accordance with AASHTO M111 (ASTM A123).
4. When required, provide 7/8 inch diameter x 2 1/2 inch high strength cap screws with heavy hex heads and plate washers. Cap screws shall be galvanized and conform to the requirements of ASTM A307 or A449. Plain washers shall be galvanized and conform to ASTM F844.
5. All Costs associated with furnishing and installing the 3 cable guardrail connection assembly shall be incidental to the contract unit price for the bid items "Class A45 Concrete, Bridge Deck", "Class A45 Concrete, Bridge Repair", or "3 Cable Guardrail", as applicable.



**SEC. A - A**



**VIEW B - B**

June 26, 2012

*Published Date: 1st Qtr. 2013*

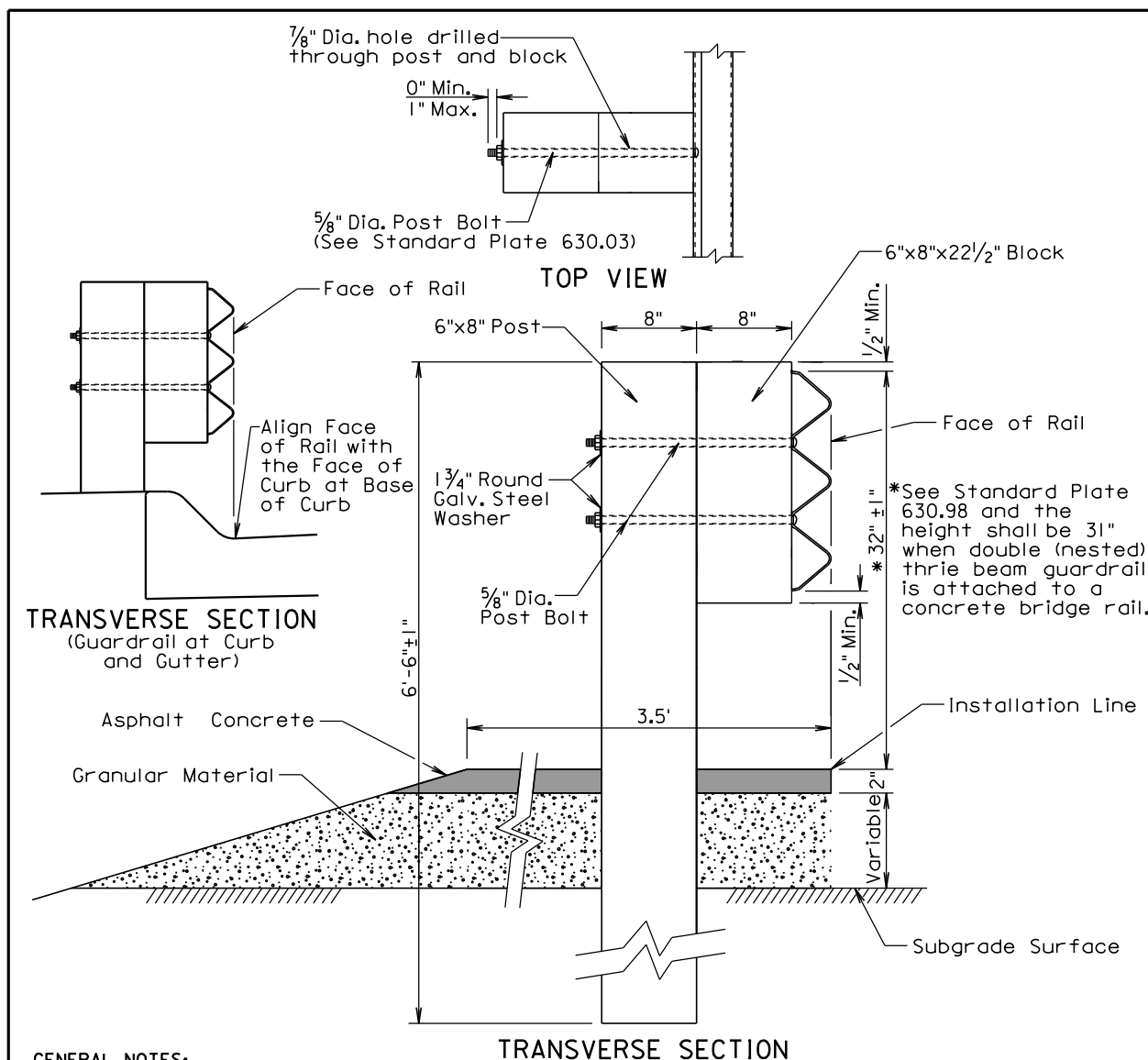
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**3 CABLE GUARDRAIL CONNECTION ASSEMBLY**

**PLATE NUMBER  
629.31**

Sheet 1 of 1

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



**GENERAL NOTES:**

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

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

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

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

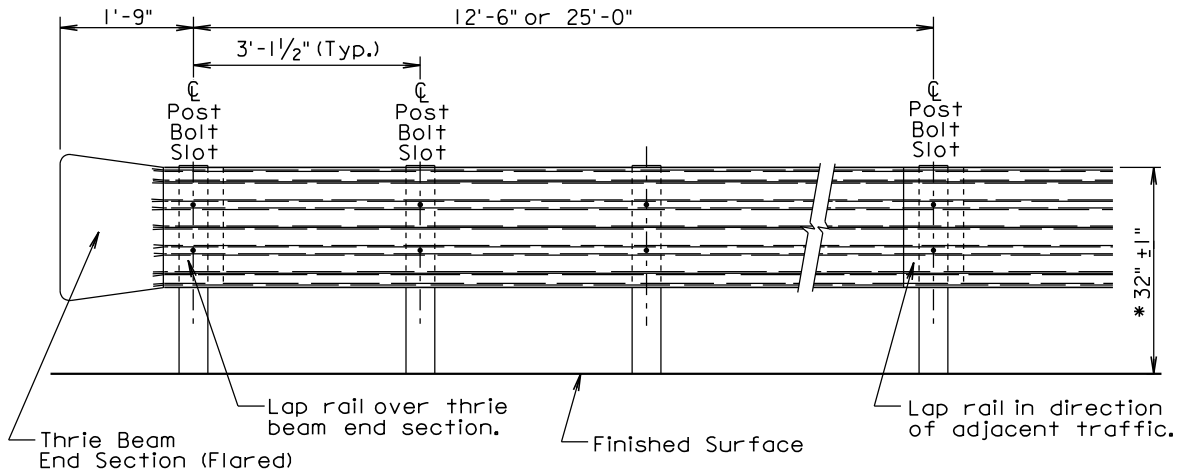
The top of posts and top of block shall have a true square cut. The top of post and top of block shall be flush.

December 23, 2010

Published Date: 1st Qtr. 2013	SD DOT	THRIE BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.01
			Sheet 1 of 1

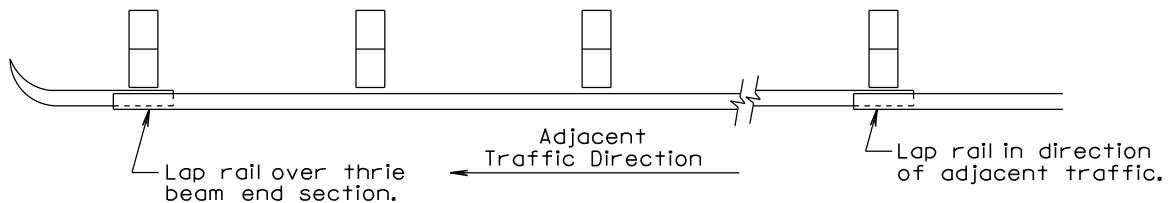


Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



**ELEVATION**

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



**PLAN**

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

For Informational Purposes Only

**GENERAL NOTES:**

All thrie beam rail shall be Type 1.

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

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

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

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

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

December 23, 2010

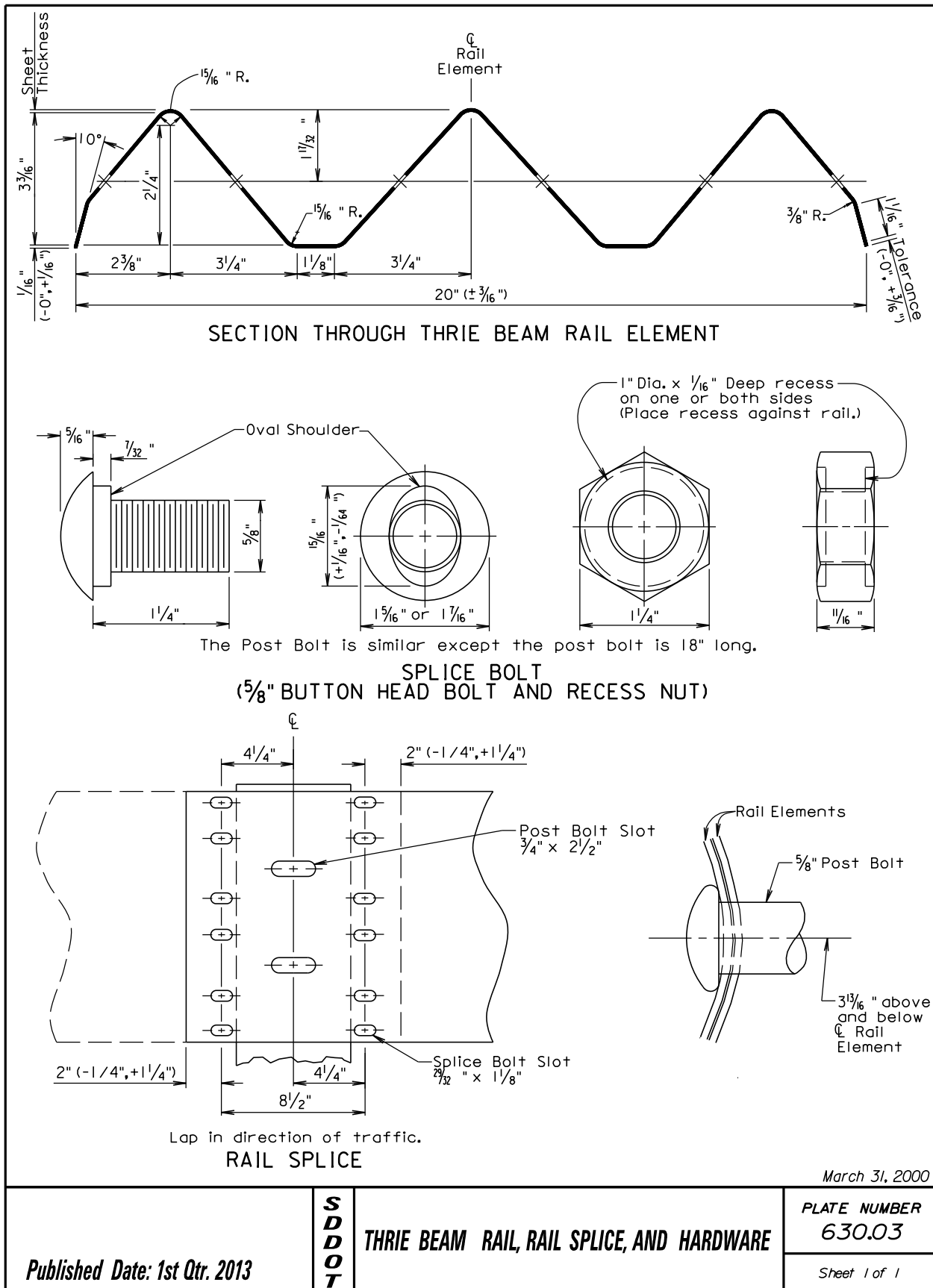
*Published Date: 1st Qtr. 2013*

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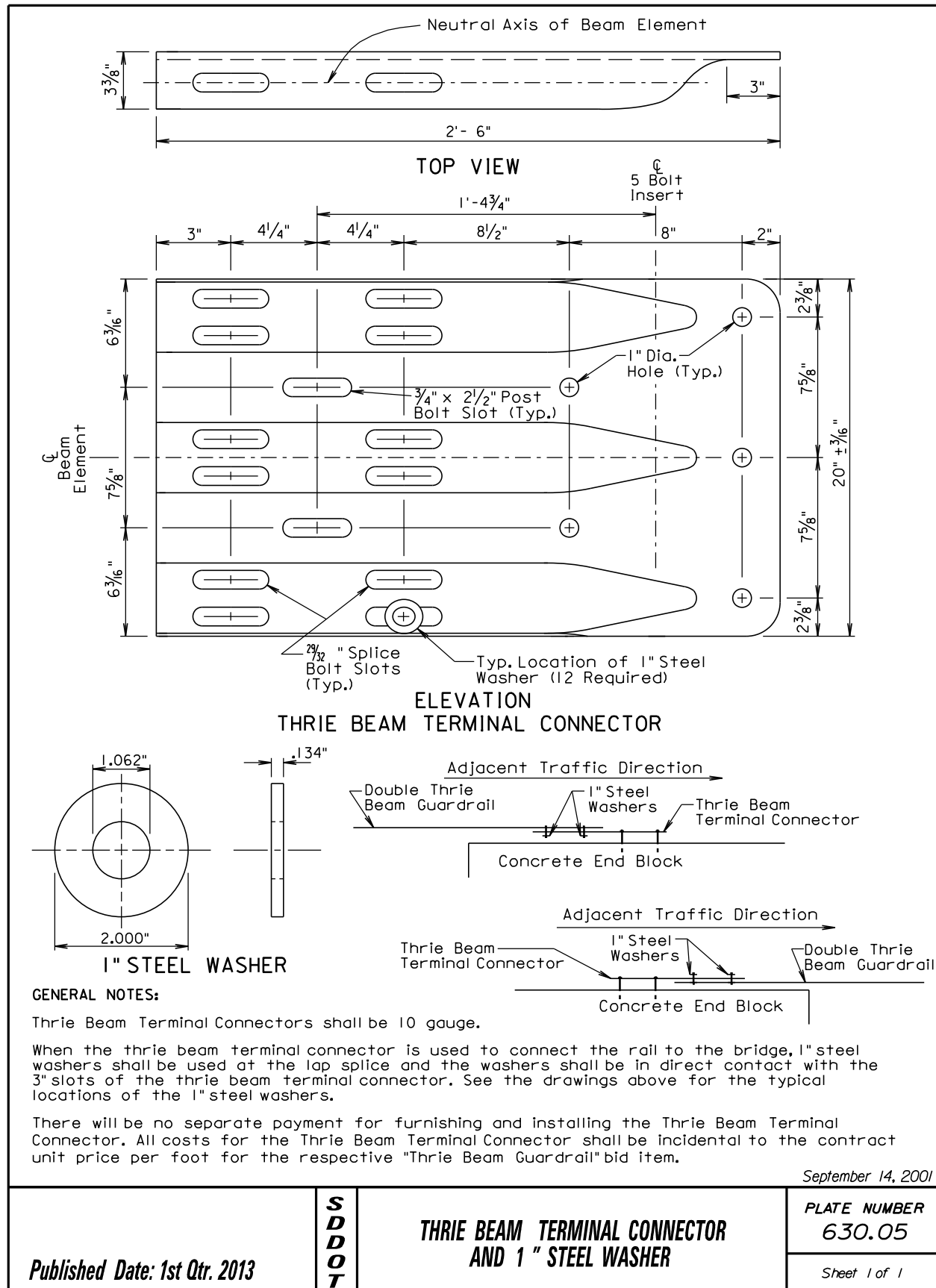
**THRIE BEAM GUARDRAIL INSTALLATION**

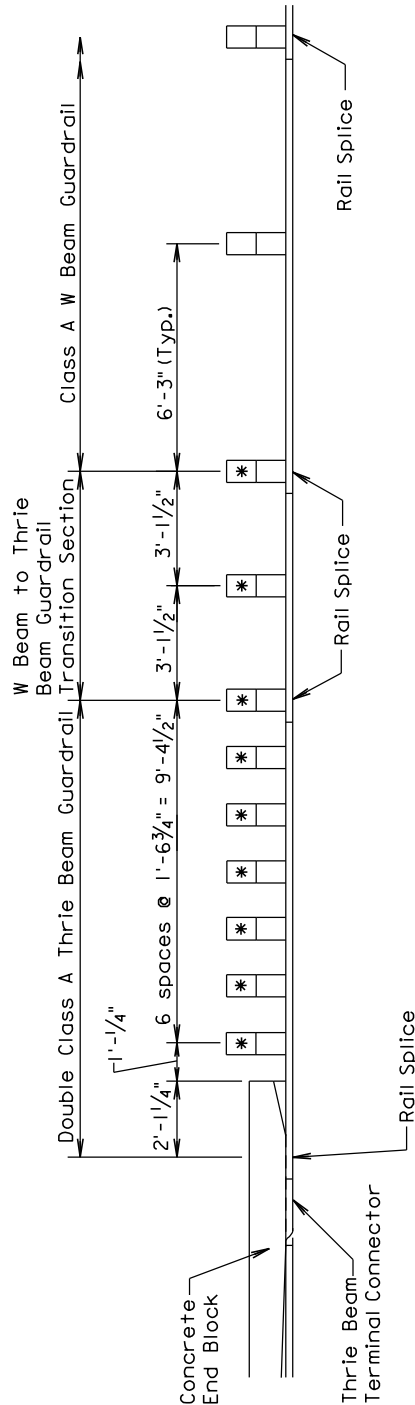
**PLATE NUMBER  
630.02**

Sheet 1 of 1



Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru

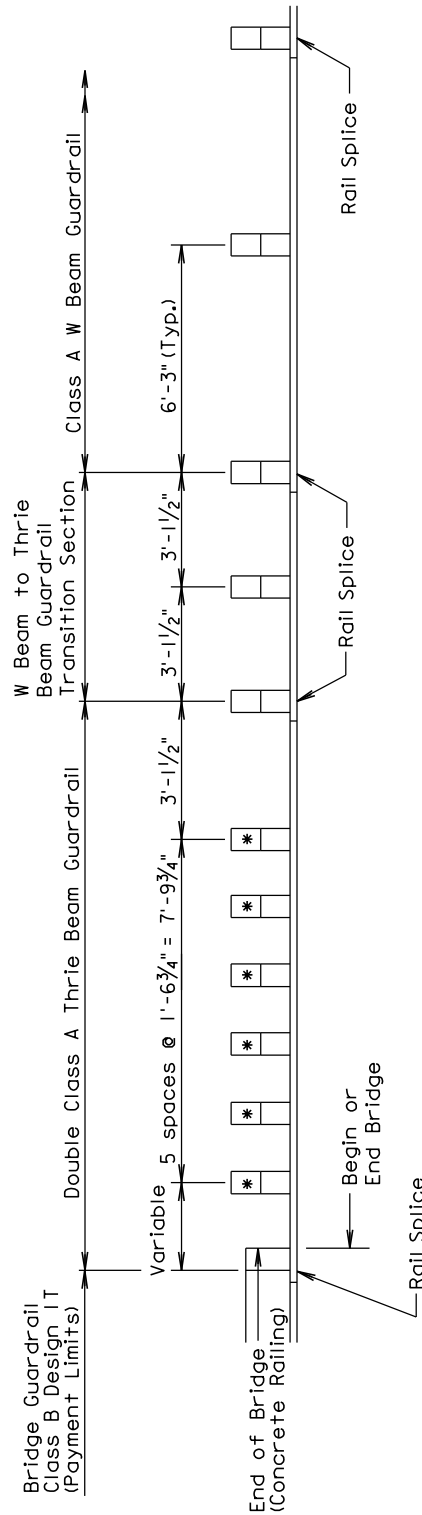




\* 6" x 8" x 7' posts shall be used at these locations.

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

<i>Published Date: 1st Qtr. 2013</i>	<b>S D D O T</b>	<b>POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END</b>	<div>December 23, 2002</div> <div>PLATE NUMBER 630.15</div> <div>Sheet 1 of 1</div>
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\* 6" x 8" x 7' posts shall be used at these locations.

# POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

March 31, 2000

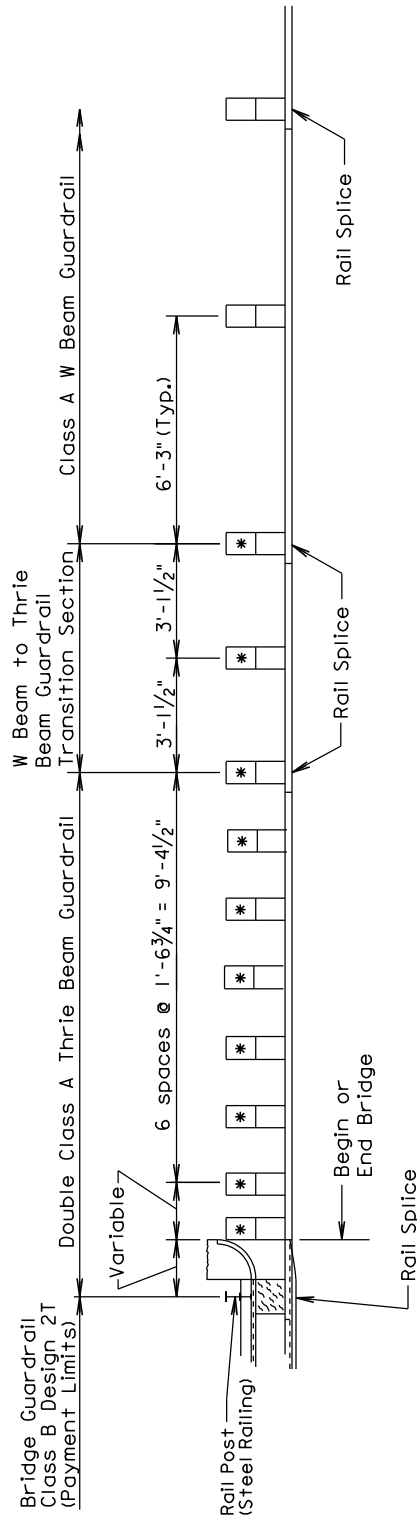
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**POST SPACING ARRANGEMENT FOR  
 THRIE BEAM GUARDRAIL AT BRIDGE END  
 (BRIDGE GUARDRAIL DESIGN 1T)**

PLATE NUMBER  
 630.20

Sheet 1 of 1



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

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

Published Date: 1st Qtr. 2013

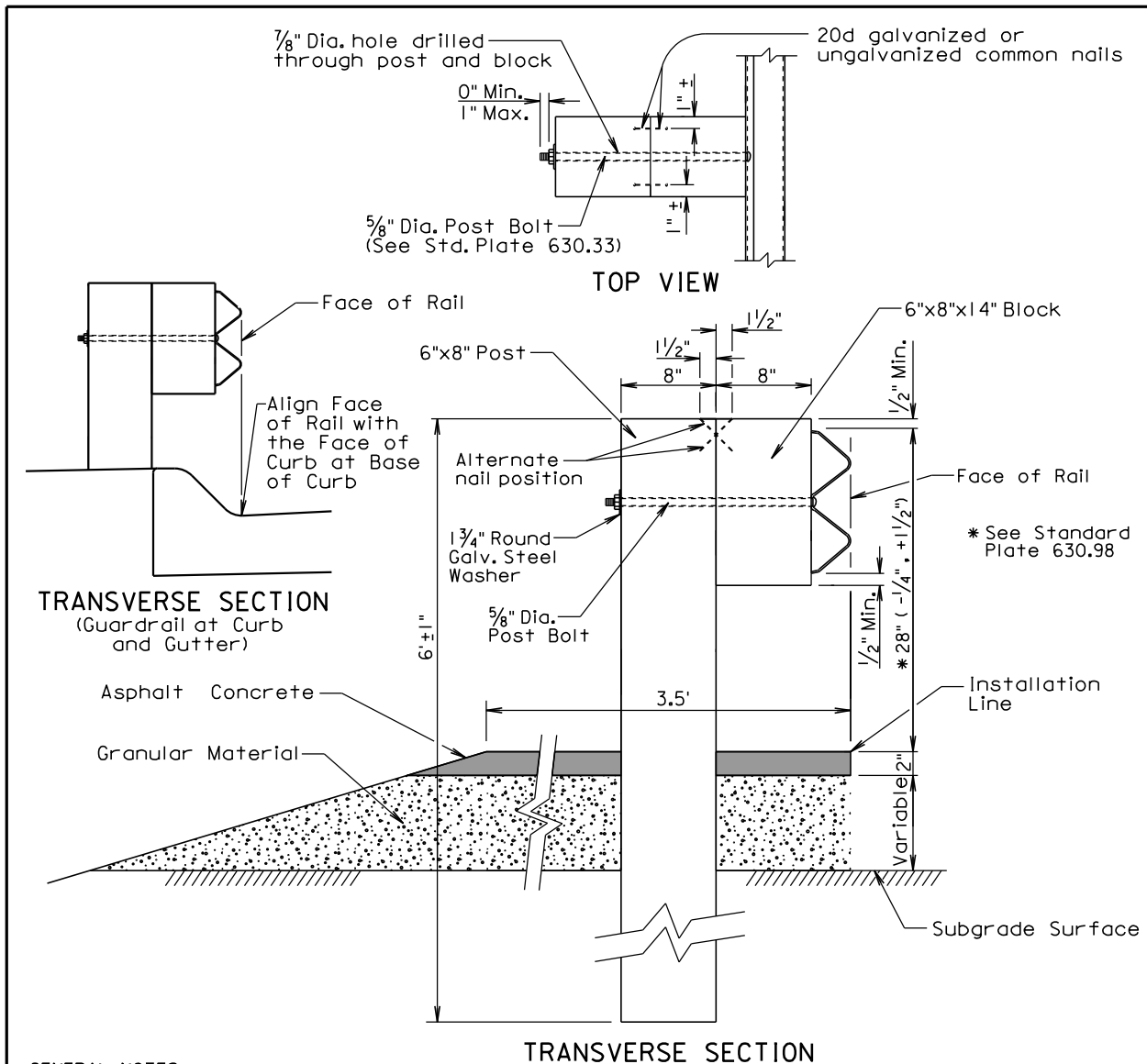
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**POST SPACING ARRANGEMENT FOR  
 THRIE BEAM GUARDRAIL AT BRIDGE END  
 (BRIDGE GUARDRAIL DESIGN 2T)**

PLATE NUMBER  
 630.21

Sheet 1 of 1

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



**GENERAL NOTES:**

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

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

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

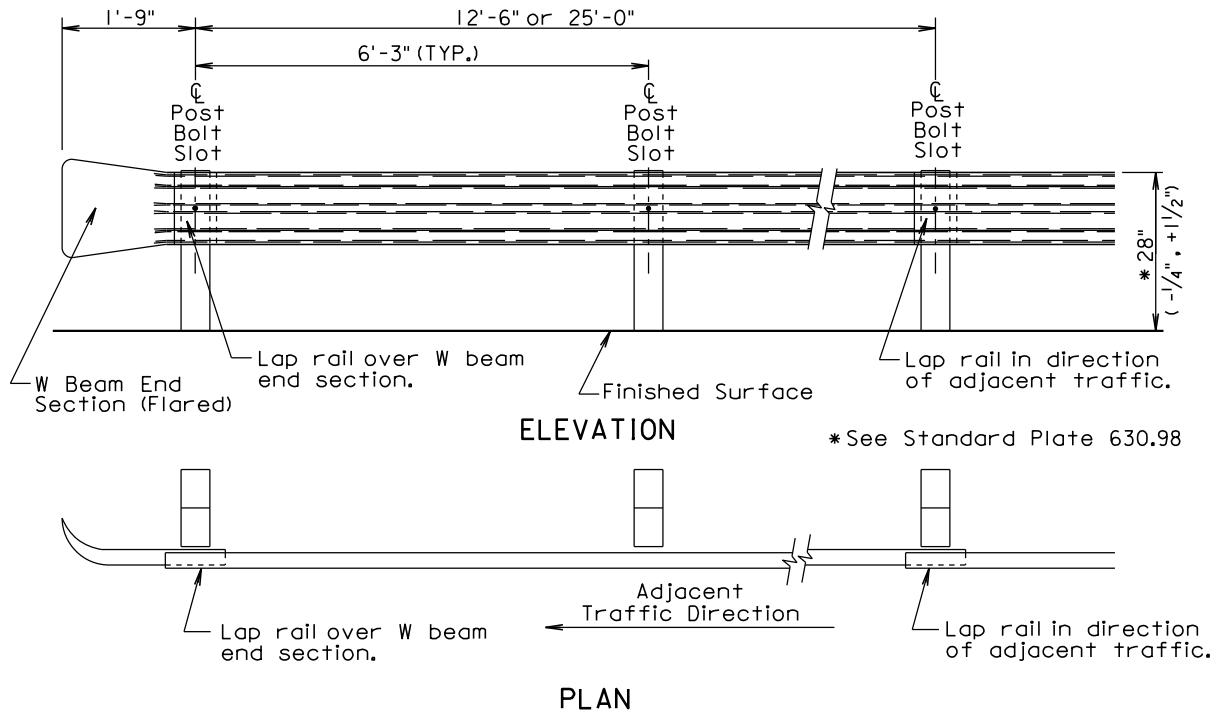
The cross slope for the surfacing and subgrade surface shall be as specified in the plans (See Typical Sections and/or Cross Sections).

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

December 23, 2010

Published Date: 1st Qtr. 2013	S D D O T	W BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.31
			Sheet 1 of 1

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



W BEAM GUARDRAIL DEFLECTION CRITERIA	
POST SPACING	MAXIMUM DEFLECTION
6'-3"	3'-3"
3'-1½"	2'-0"

For Informational Purposes Only

**GENERAL NOTES:**

All W beam rail shall be Type I.

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

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

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

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

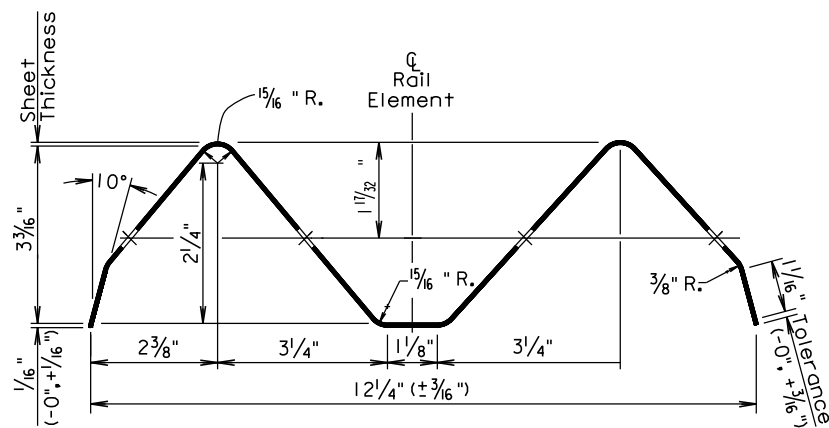
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

December 23, 2010

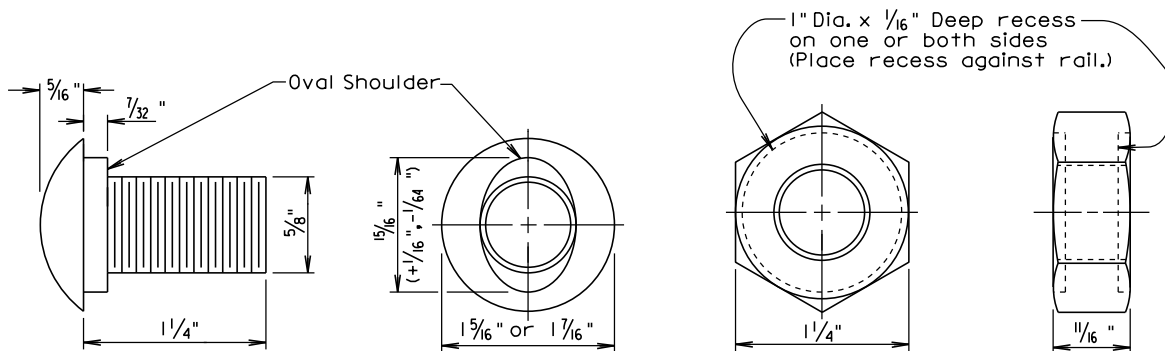
<i>Published Date: 1st Qtr. 2013</i>	<b>S D D O T</b>	<b>W BEAM GUARDRAIL INSTALLATION</b>	<b>PLATE NUMBER</b> <b>630.32</b>
			Sheet 1 of 1



Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 0001-391  
PCN i2ru

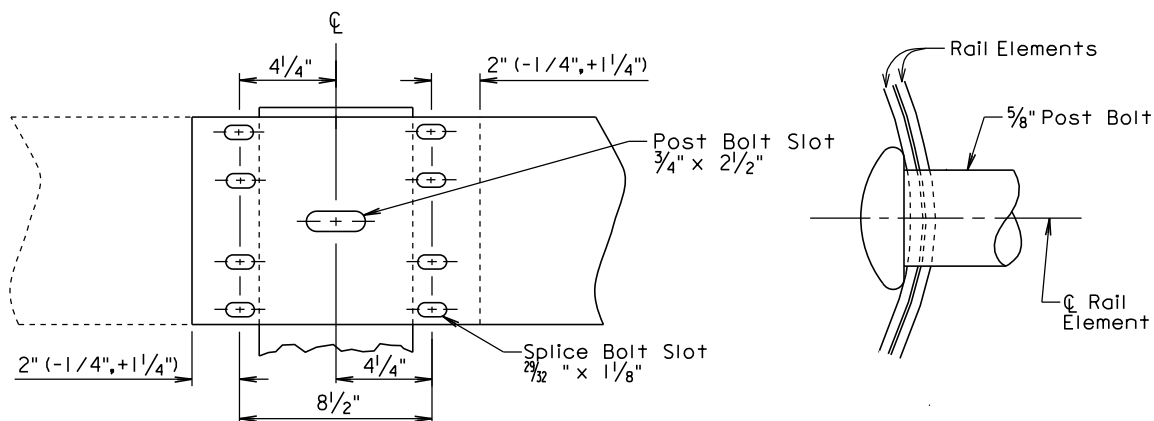


SECTION THROUGH W BEAM RAIL ELEMENT



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

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



Lap in direction of traffic.

## RAIL SPLICE

December 23, 2004

***Published Date: 1st Qtr. 2013***

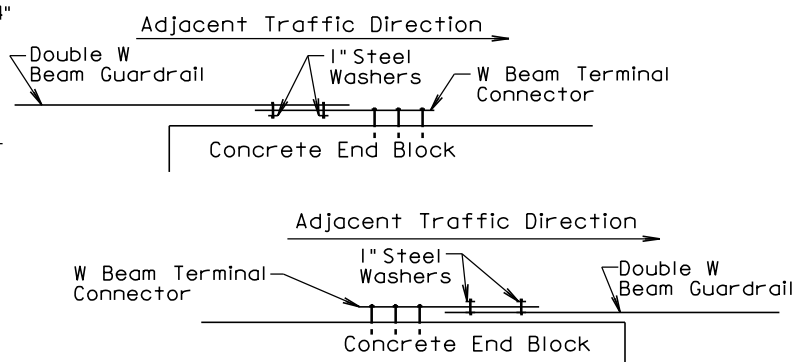
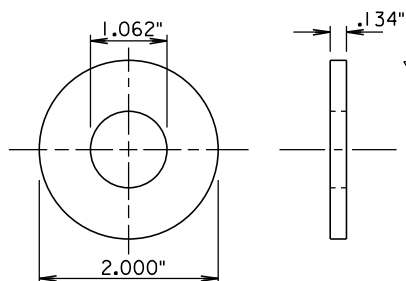
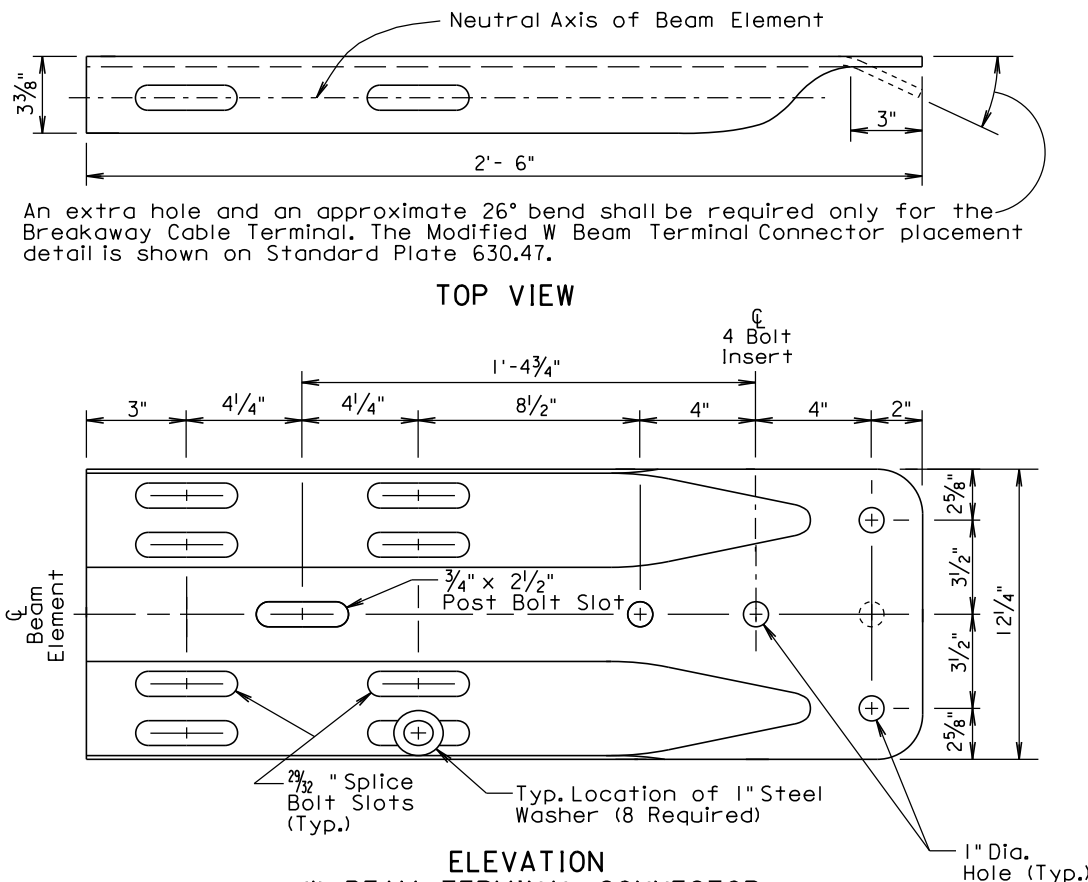
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## W BEAM RAIL, RAIL SPLICE, AND HARDWARE

PLATE NUMBER  
630.33

Sheet 1 of 1

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



**GENERAL NOTES:**

W Beam Terminal Connectors shall be 10 gauge.

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

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

September 14, 2001

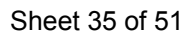
*Published Date: 1st Qtr. 2013*

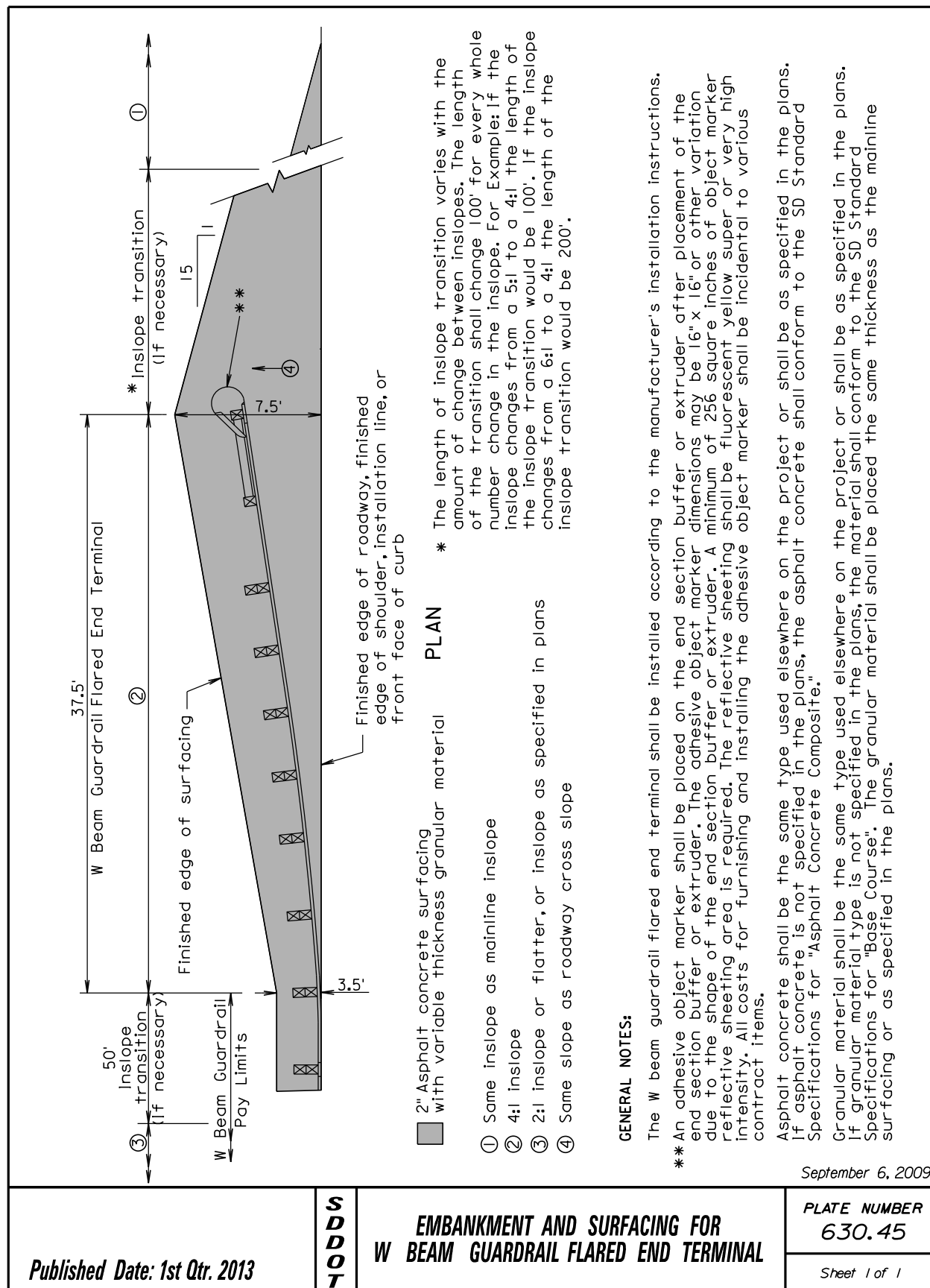
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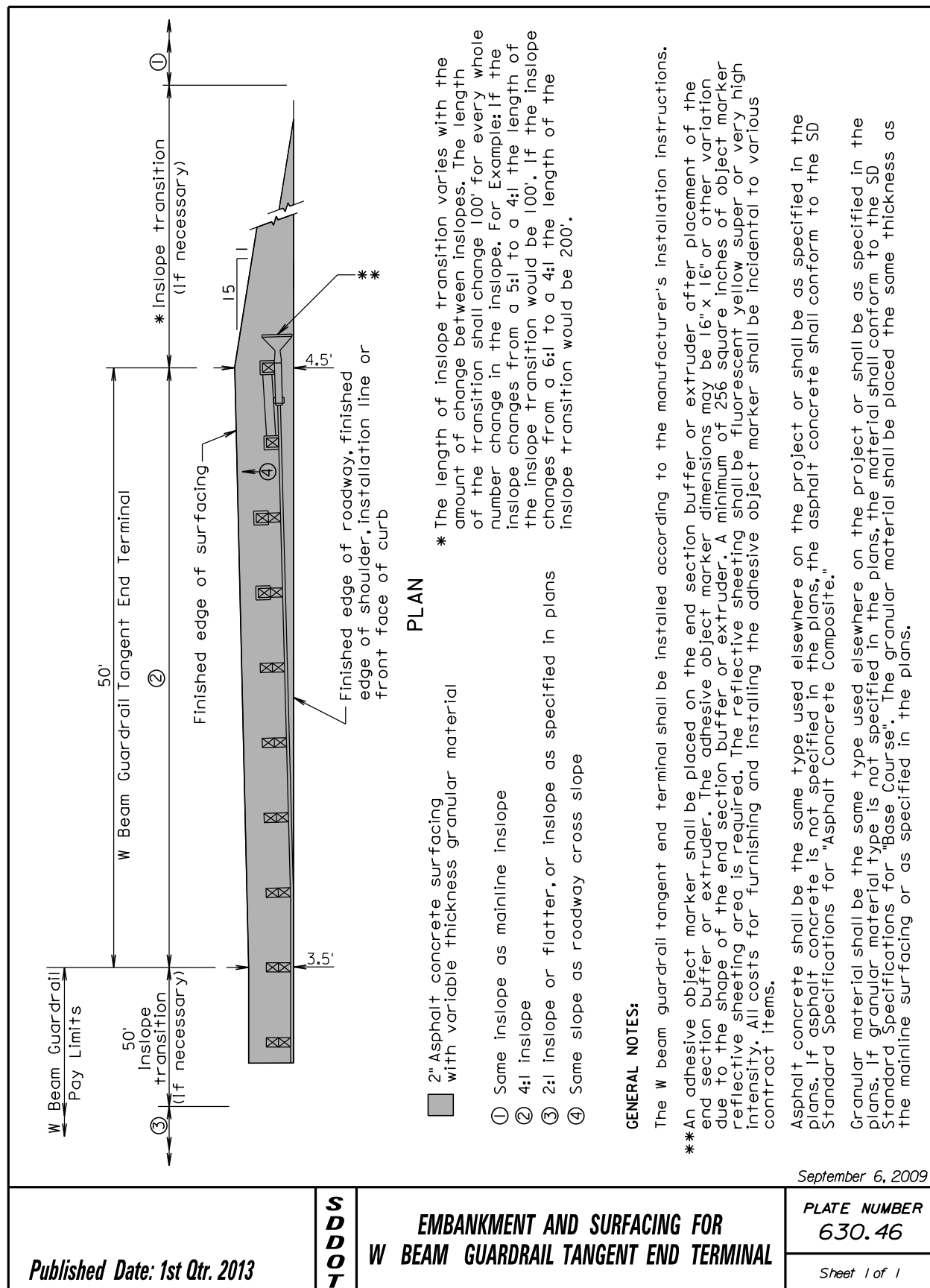
**W BEAM TERMINAL CONNECTOR  
AND 1" STEEL WASHER**

**PLATE NUMBER  
630.35**

Sheet 1 of 1







Published Date: 1st Qtr. 2013

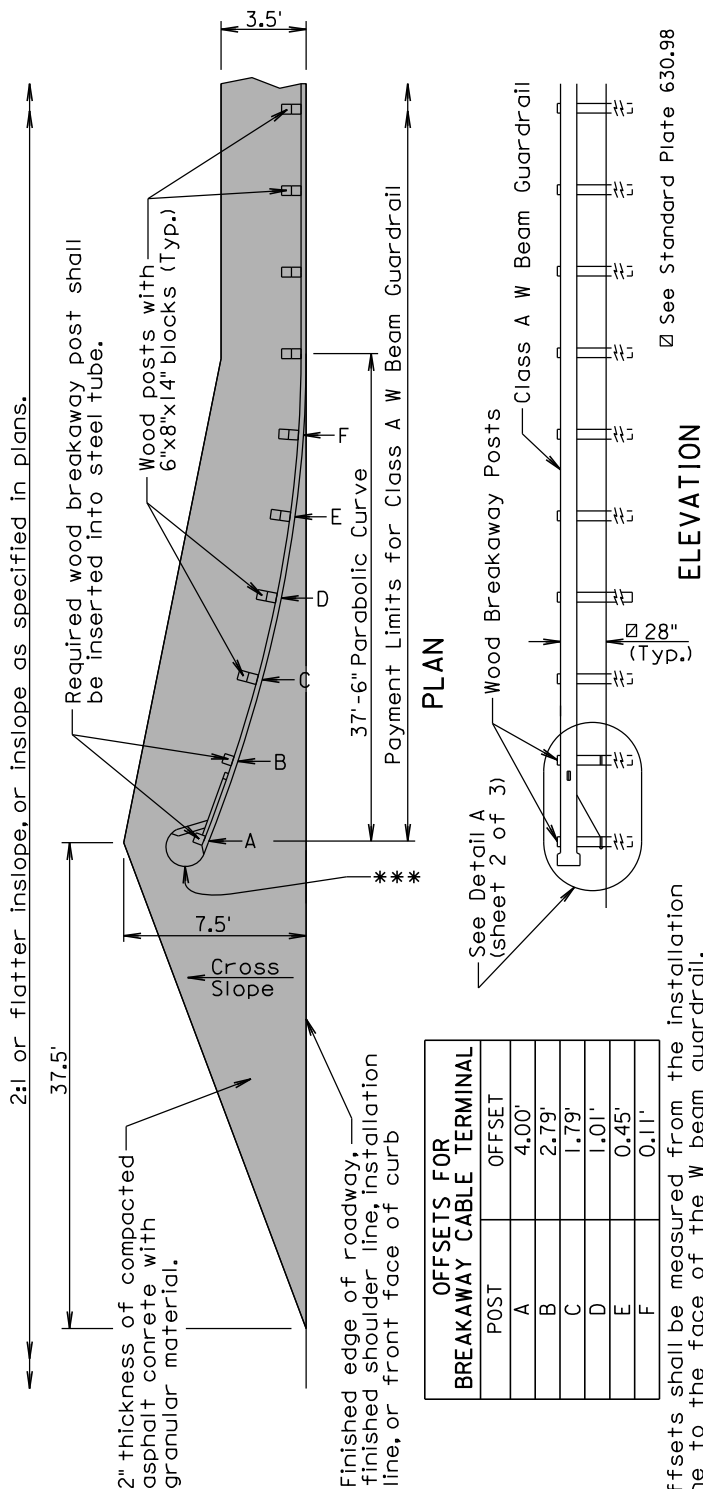
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# EMBANKMENT AND SURFACING FOR W BEAM GUARDRAIL TANGENT END TERMINAL

September 6, 2009

PLATE NUMBER  
630.46

Sheet 1 of 1



**GENERAL NOTES:**

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

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

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

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

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

June 26, 2010

**Published Date: 1st Qtr. 2013**

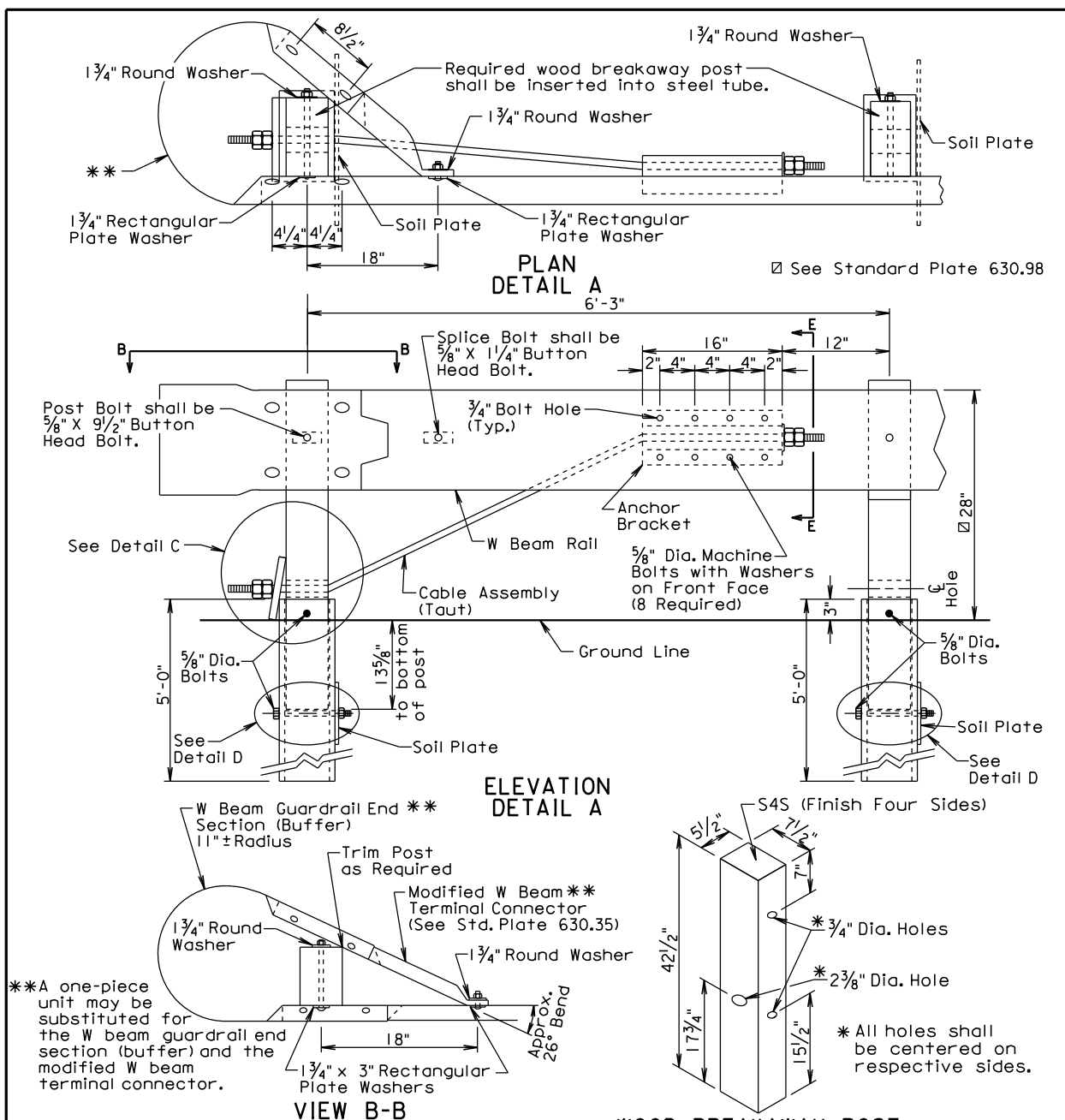
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**W BEAM GUARDRAIL  
BREAKAWAY CABLE TERMINAL**

PLATE NUMBER  
630.47

Sheet 1 of 3

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



Published Date: 1st Qtr. 2013

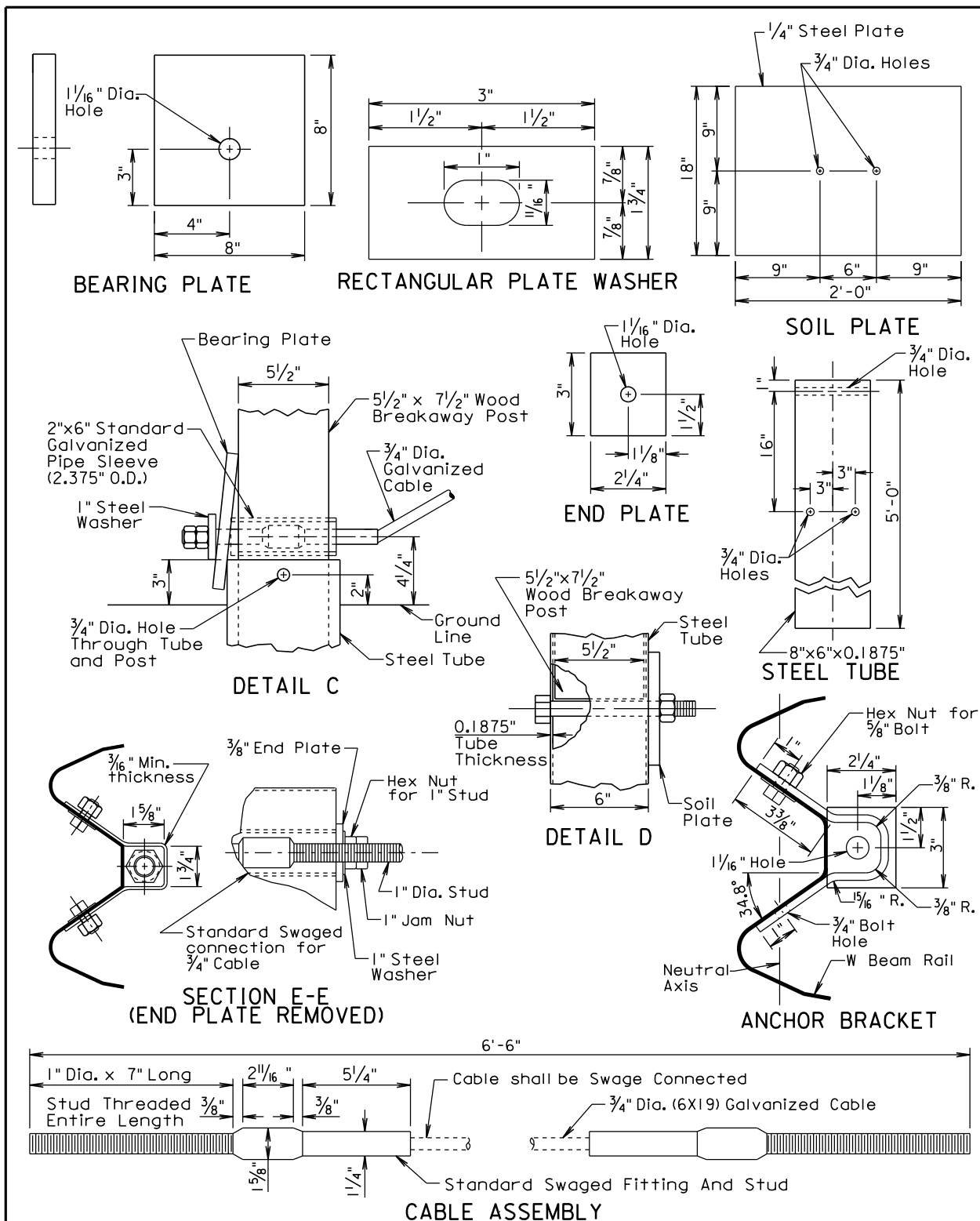
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**W BEAM GUARDRAIL  
BREAKAWAY CABLE TERMINAL**

PLATE NUMBER  
**630.47**

Sheet 2 of 3

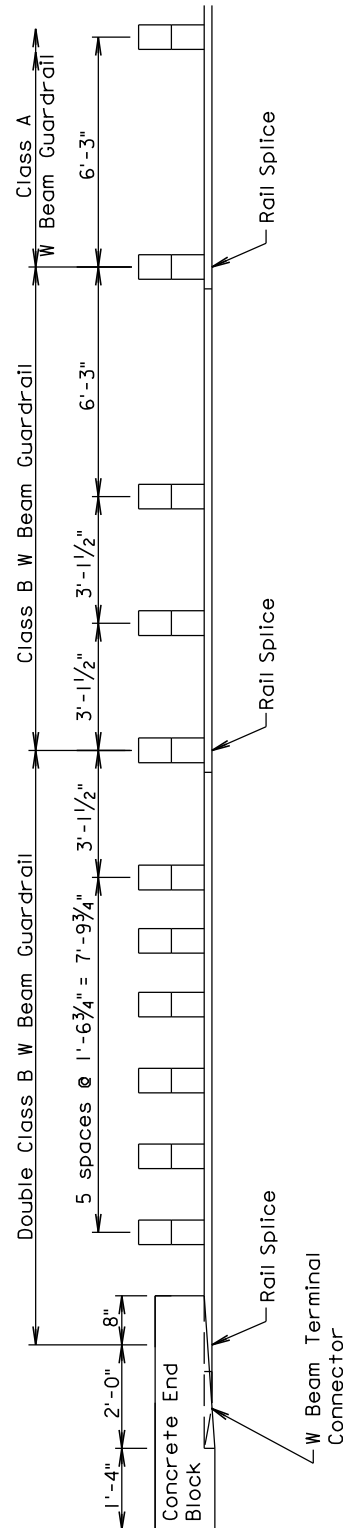
Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



June 26, 2010

<p><i>Published Date: 1st Qtr. 2013</i></p>	<p><b>S D D O T</b></p>	<p><b>W BEAM GUARDRAIL BREAKAWAY CABLE TERMINAL</b></p>	<p>PLATE NUMBER <b>630.47</b></p>
			<p>Sheet 3 of 3</p>





POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END

March 31, 2000

Published Date: 1st Qtr. 2013

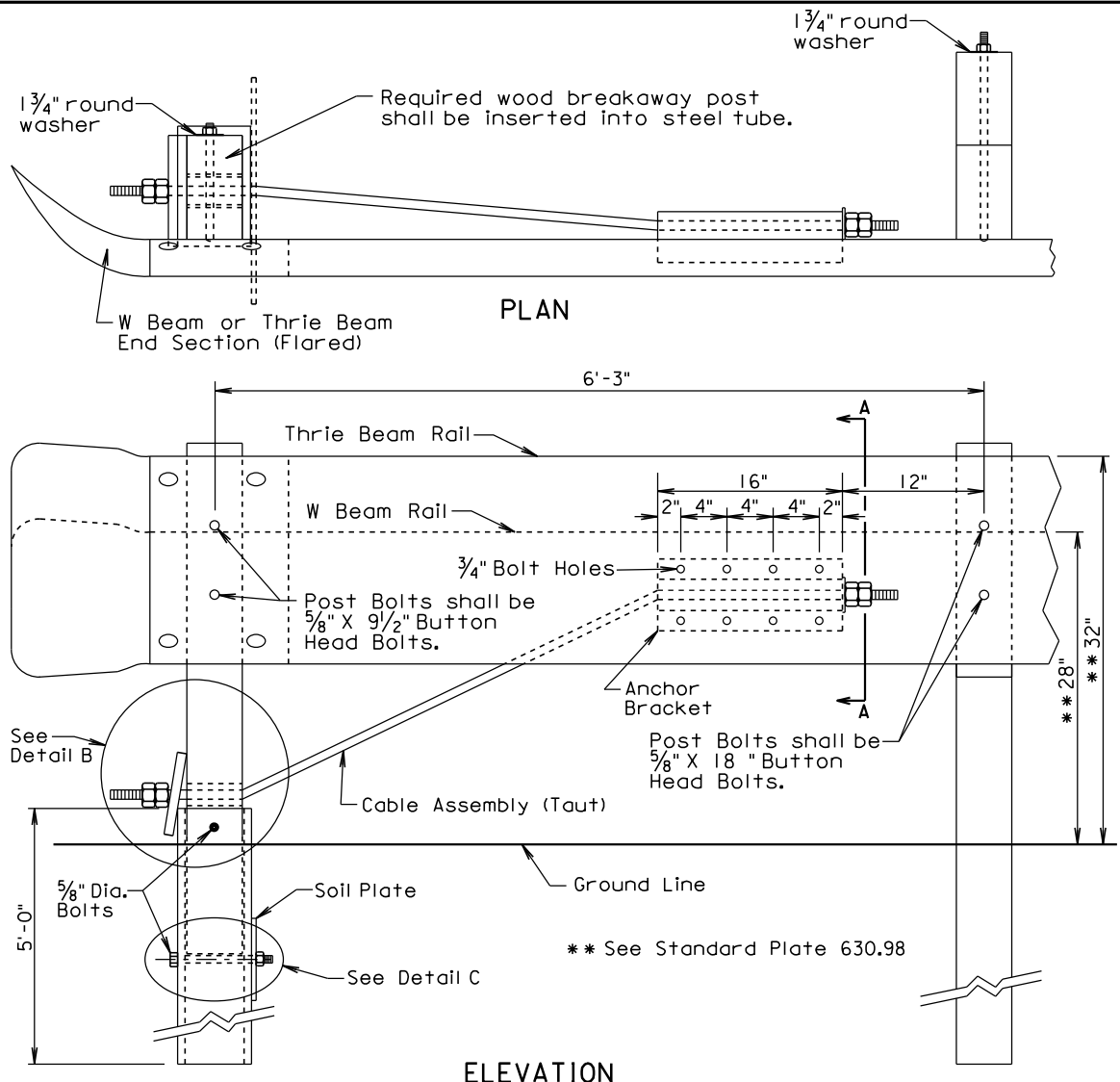
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**POST SPACING ARRANGEMENT FOR  
 W BEAM GUARDRAIL AT BRIDGE END**

**PLATE NUMBER  
 630.50**

Sheet 1 of 1

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



**GENERAL NOTES:**

All hardware shall be galvanized in accordance with ASTM A153.

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

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

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

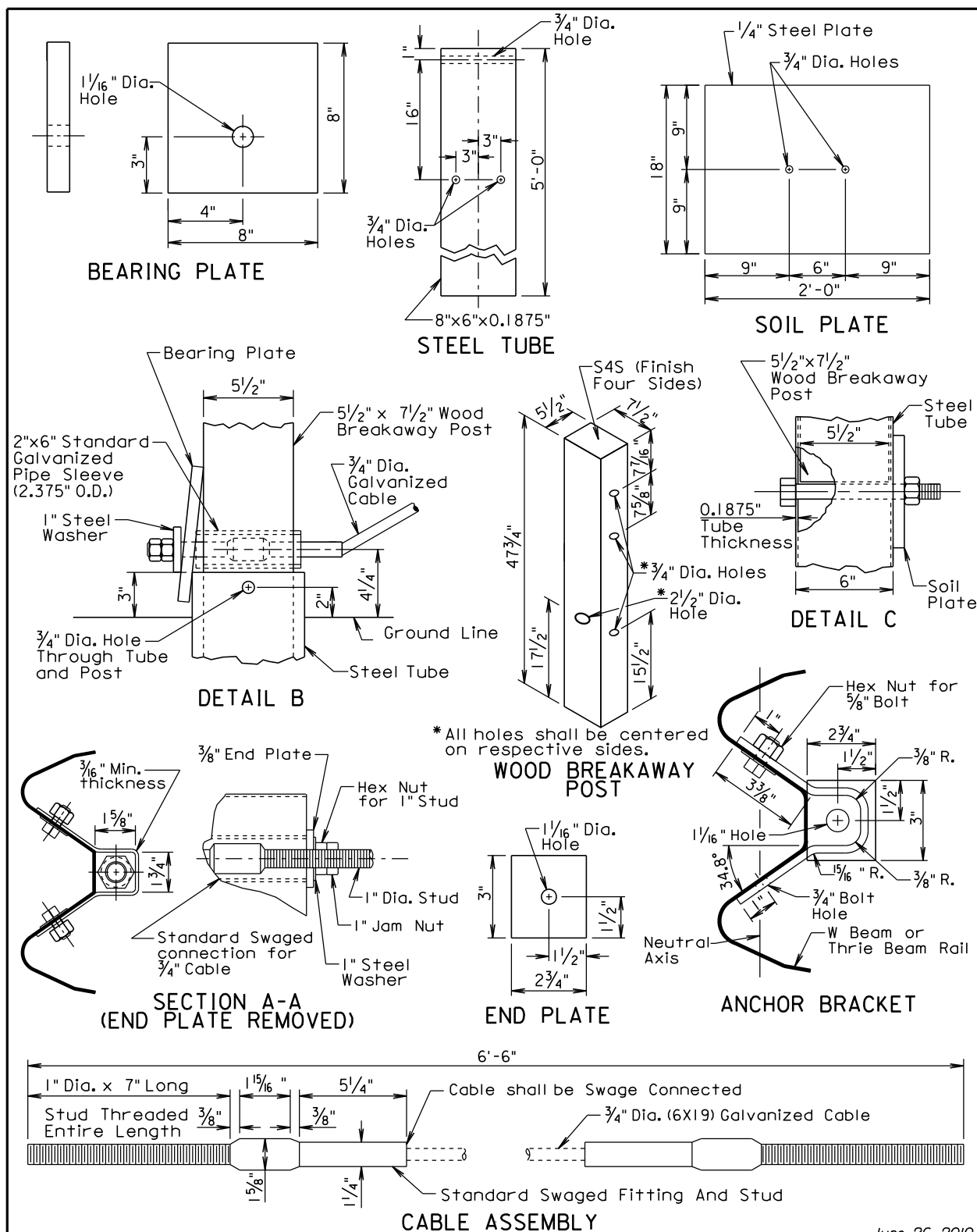
Costs for constructing the beam guardrail trailing end terminal and furnishing the anchor bracket, cable assembly, steel tube, soil plate, bearing plate, pipe sleeve, wood breakaway post, and all hardware necessary to attach anchor bracket, cable assembly, steel tube, soil plate, bearing plate, pipe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

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

June 26, 2010

Published Date: 1st Qtr. 2013	S D D O T	BEAM GUARDRAIL TRAILING END TERMINAL	PLATE NUMBER 630.80
			Sheet 1 of 2

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



June 26, 2010

Published Date: 1st Qtr. 2013

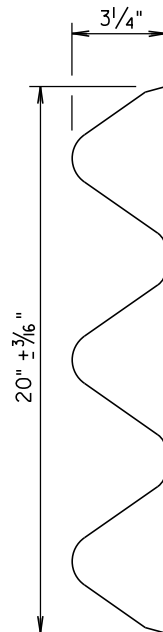
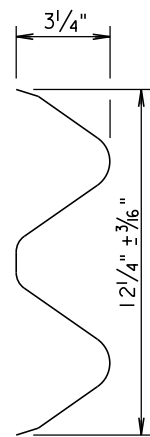
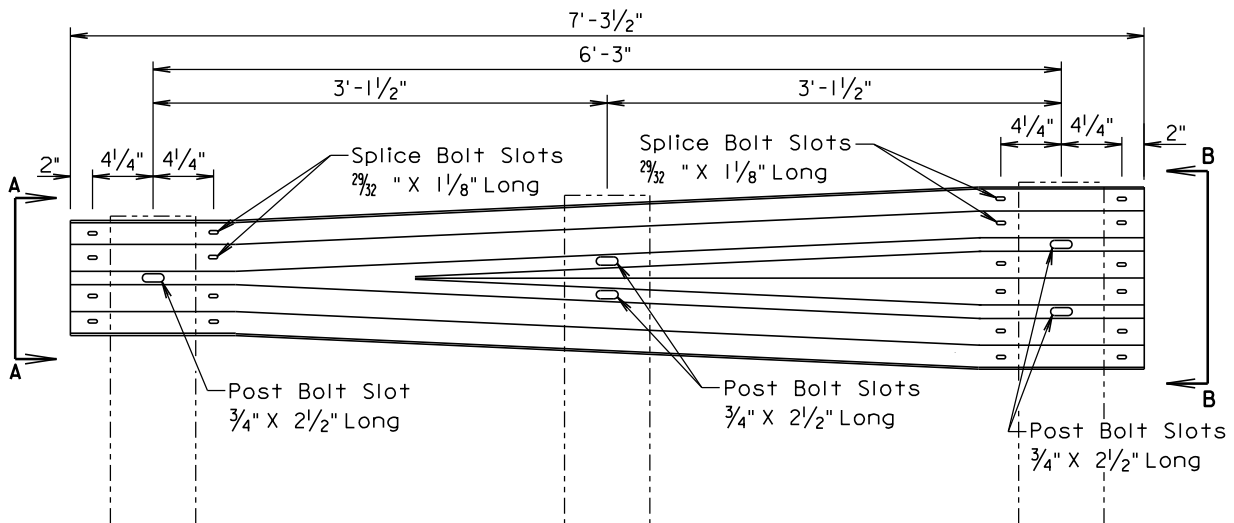
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**BEAM GUARDRAIL TRAILING END TERMINAL**

**PLATE NUMBER**  
**630.80**

Sheet 2 of 2

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



**GENERAL NOTE:**

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

March 31, 2000

*Published Date: 1st Qtr. 2013*

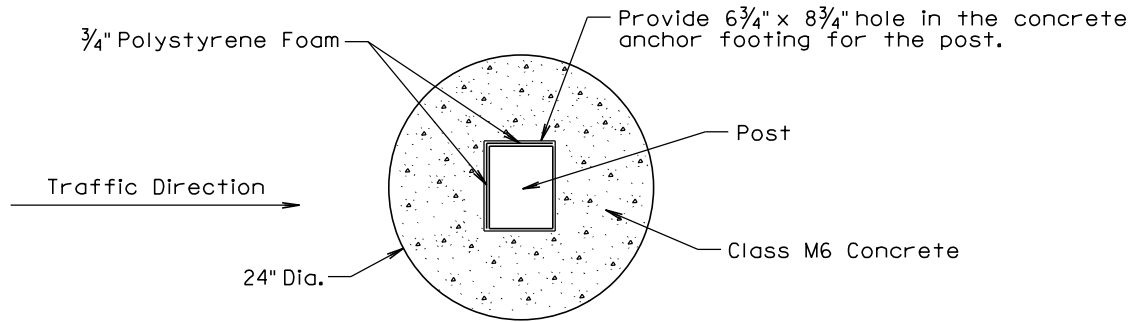
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**W BEAM TO THRIE BEAM GUARDRAIL  
TRANSITION SECTION**

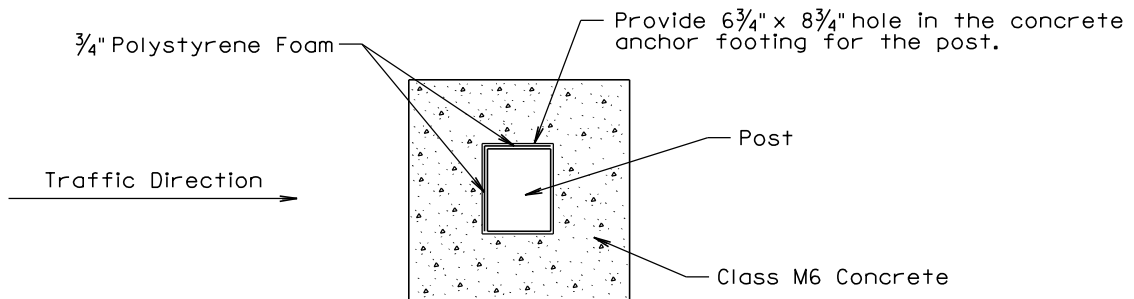
**PLATE NUMBER  
630.82**

*Sheet 1 of 1*

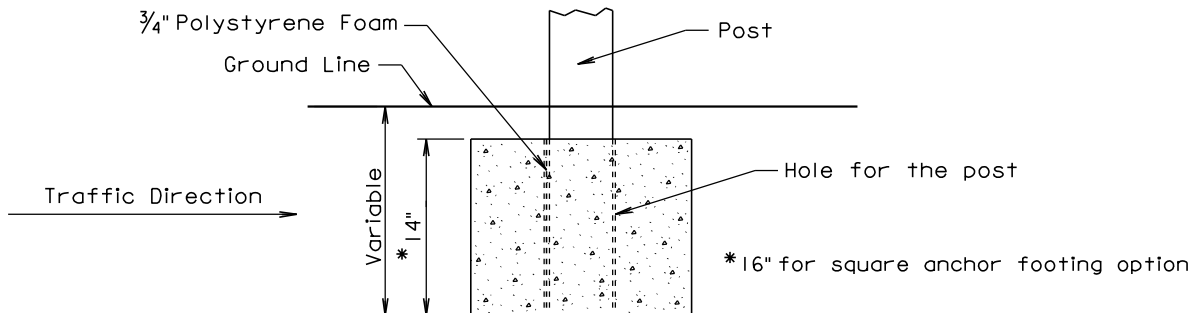
Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



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



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



**ELEVATION**

**GENERAL NOTES:**

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

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

Forms for the concrete anchor footing hole is not required.

Concrete for the concrete anchor footing shall be Class M6.

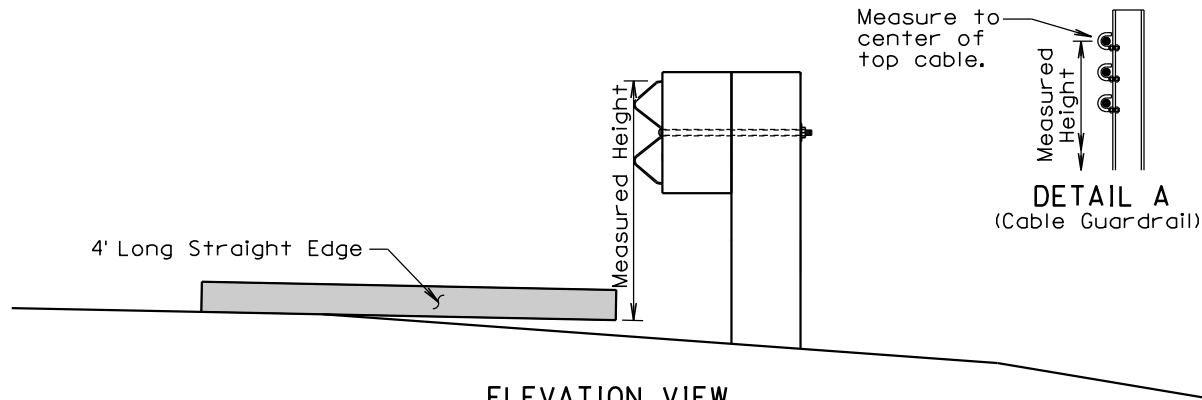
Three quarter inch polystyrene foam shall be attached to two sides of the posts. See details above for placement position of the polystyrene foam.

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

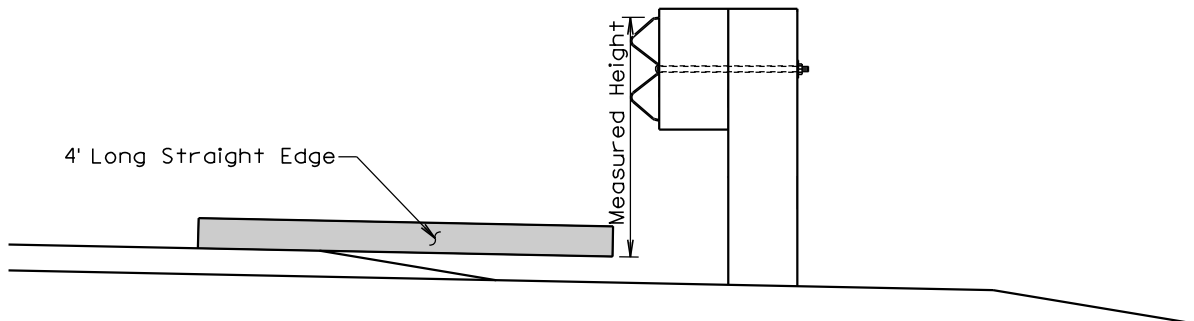
March 31, 2000

Published Date: 1st Qtr. 2013	<b>S D D O T</b>	<b>CONCRETE ANCHOR FOOTING FOR SHORT GUARDRAIL POST</b>	<b>PLATE NUMBER 630.84</b>
			Sheet 1 of 1

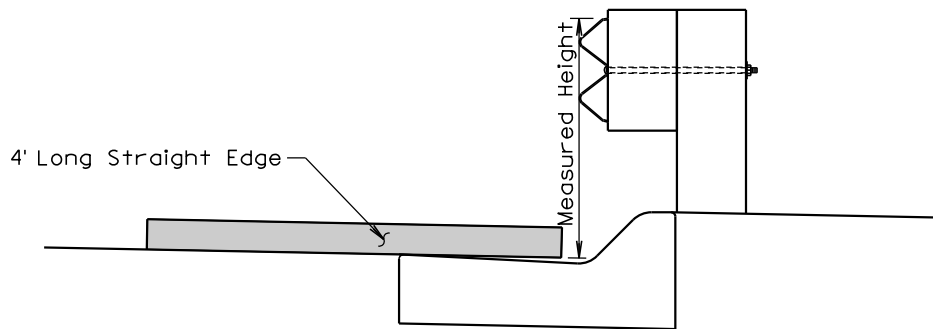
Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



**ELEVATION VIEW**  
(Guardrail Adjacent to Differential Slopes)



**ELEVATION VIEW**  
(Guardrail Adjacent to Differential Surfacing Elevations)



**ELEVATION VIEW**  
(Guardrail at Curb and Gutter)

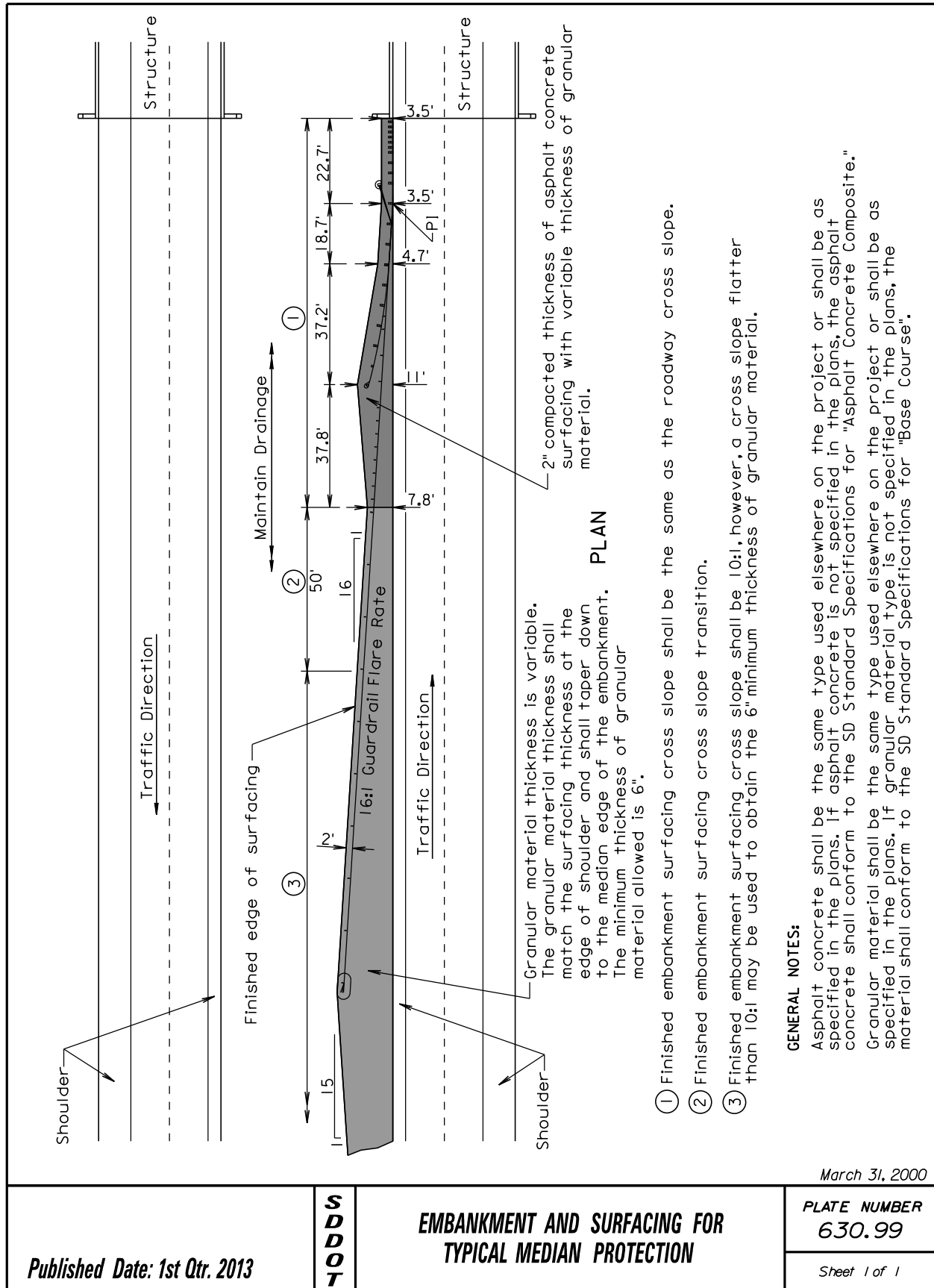
**GENERAL NOTES:**

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

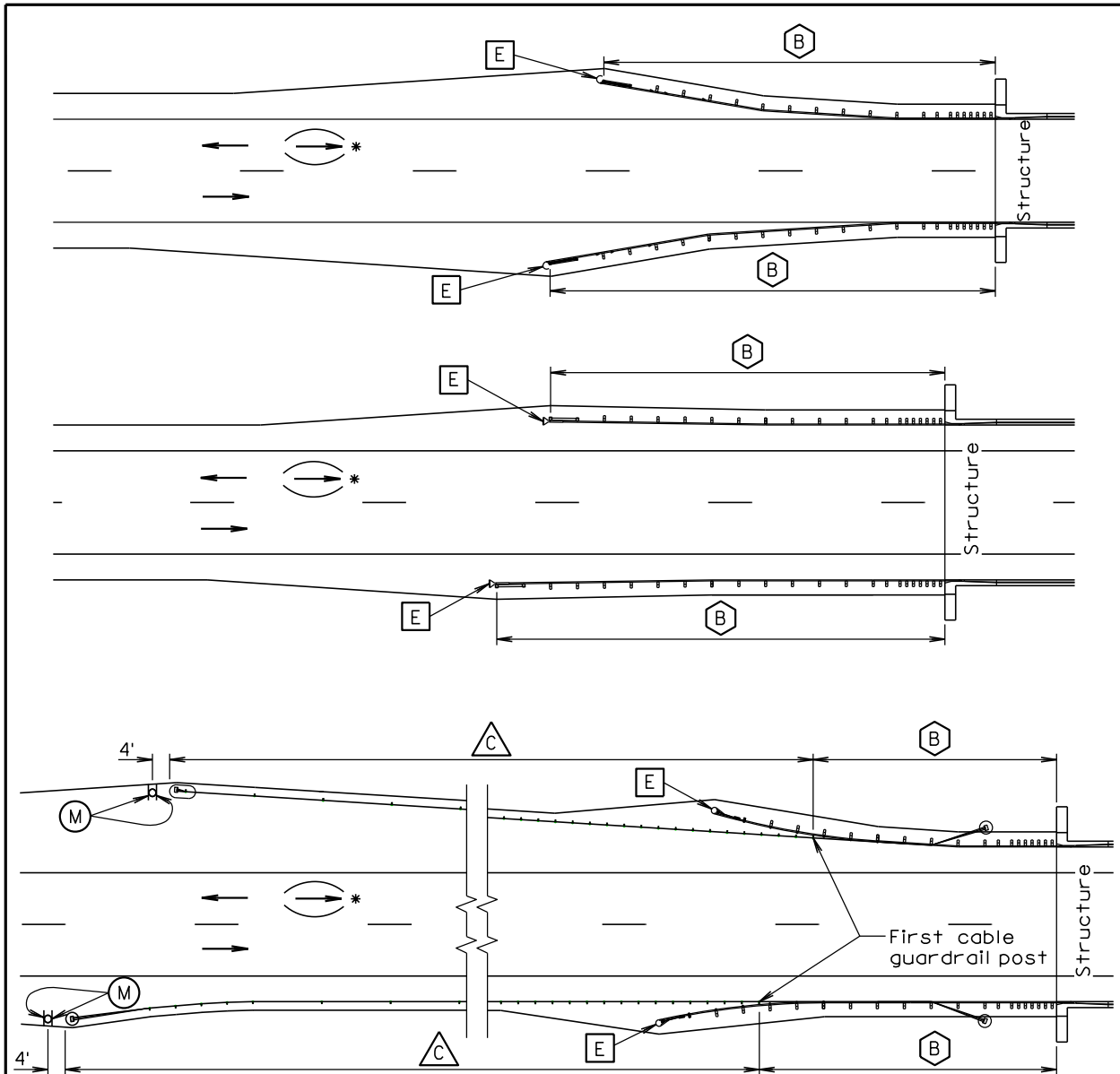
When measuring height of cable guardrail or cable barrier the height shall be measured to the center of the top cable. See Detail A.

June 26, 2010

Published Date: 1st Qtr. 2013	<b>S D D O T</b>	<b>MEASURING GUARDRAIL HEIGHT</b>	PLATE NUMBER <b>630.98</b>
			Sheet 1 of 1



Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



TYPICAL GUARDRAIL LAYOUTS

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

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

June 26, 2011

Published Date: 1st Qtr. 2013

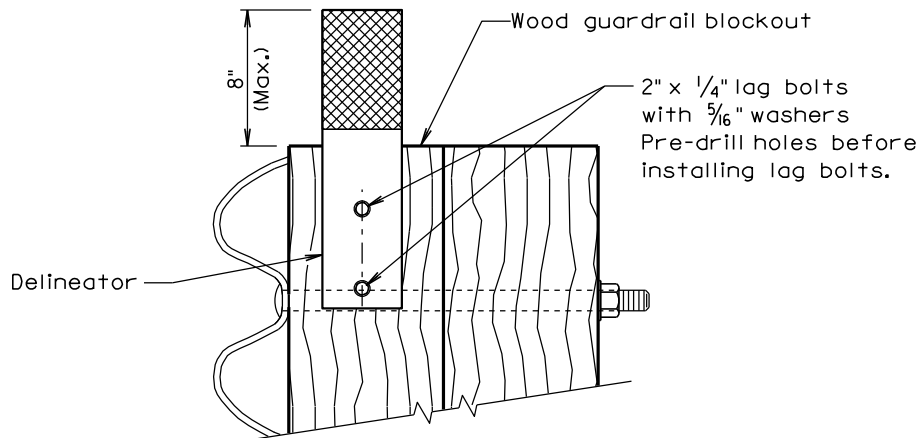
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**DELINEATION OF GUARDRAIL AT BRIDGES**

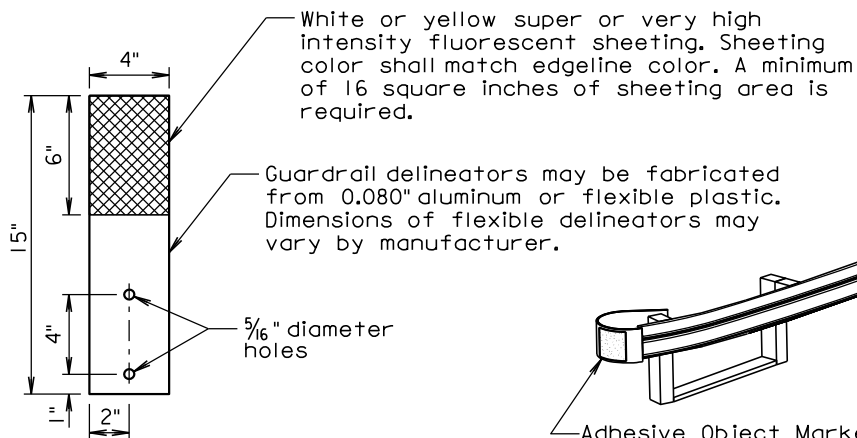
**PLATE NUMBER  
632.40**

Sheet 1 of 4



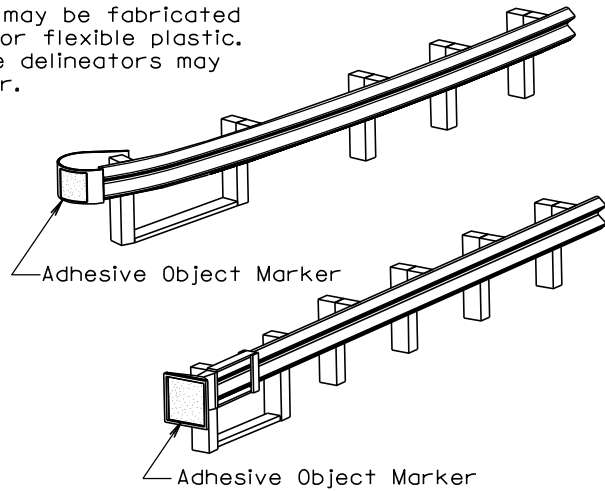


**B STEEL BEAM GUARDRAIL DELINEATION**

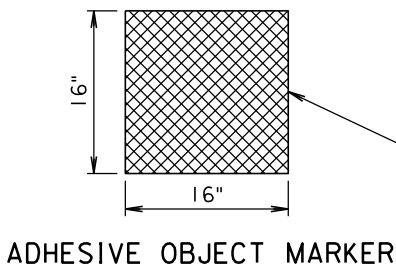


**DELINEATOR**

(For Steel Beam Guardrail)



**E GUARDRAIL TERMINAL END OBJECT MARKER**



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

June 26, 2011

Published Date: 1st Qtr. 2013

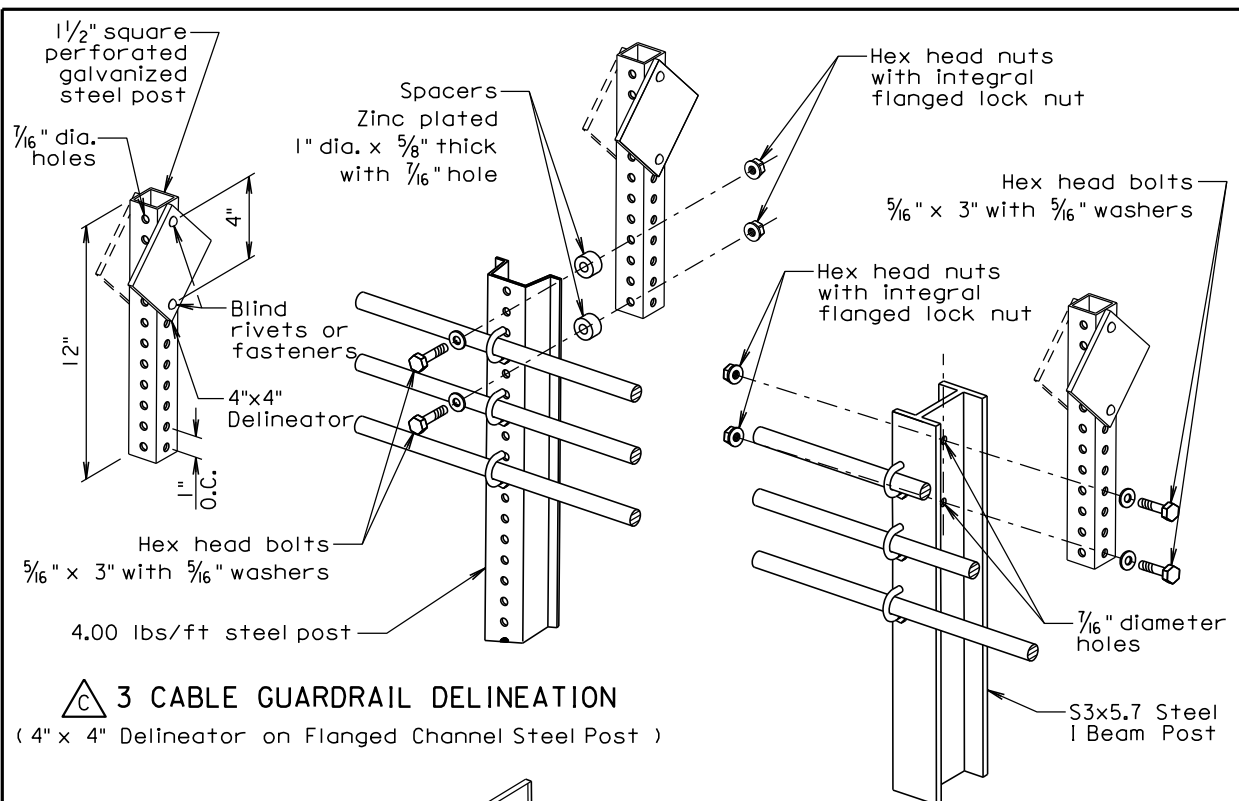
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**DELINEATION OF GUARDRAIL AT BRIDGES**

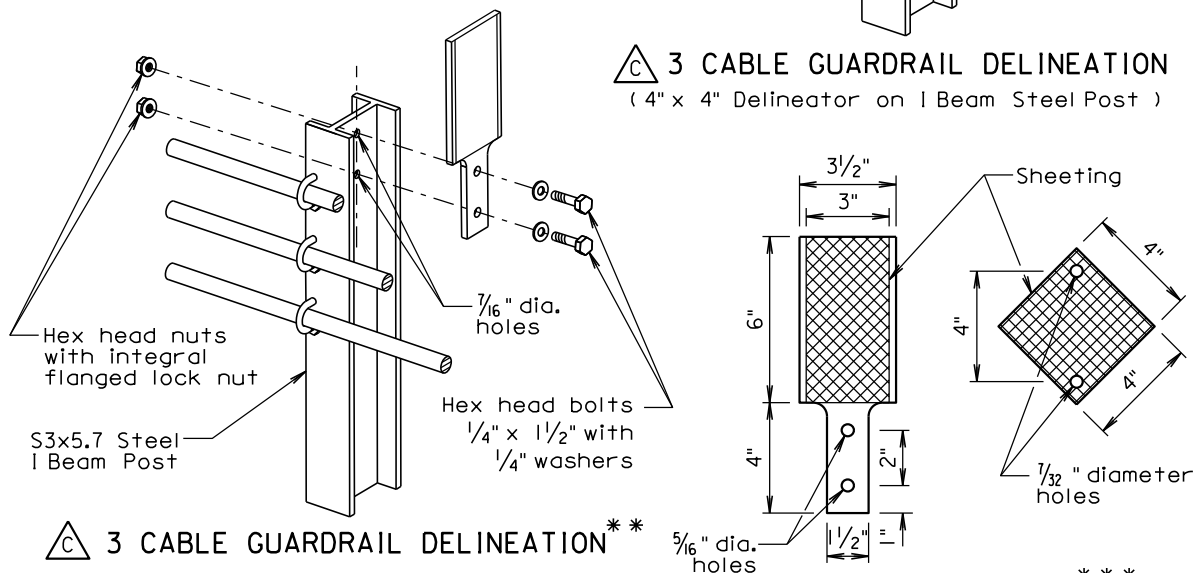
**PLATE NUMBER**  
**632.40**

Sheet 2 of 4

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



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



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

DELINEATORS \*\*\*  
( For 3 Cable Guardrail )

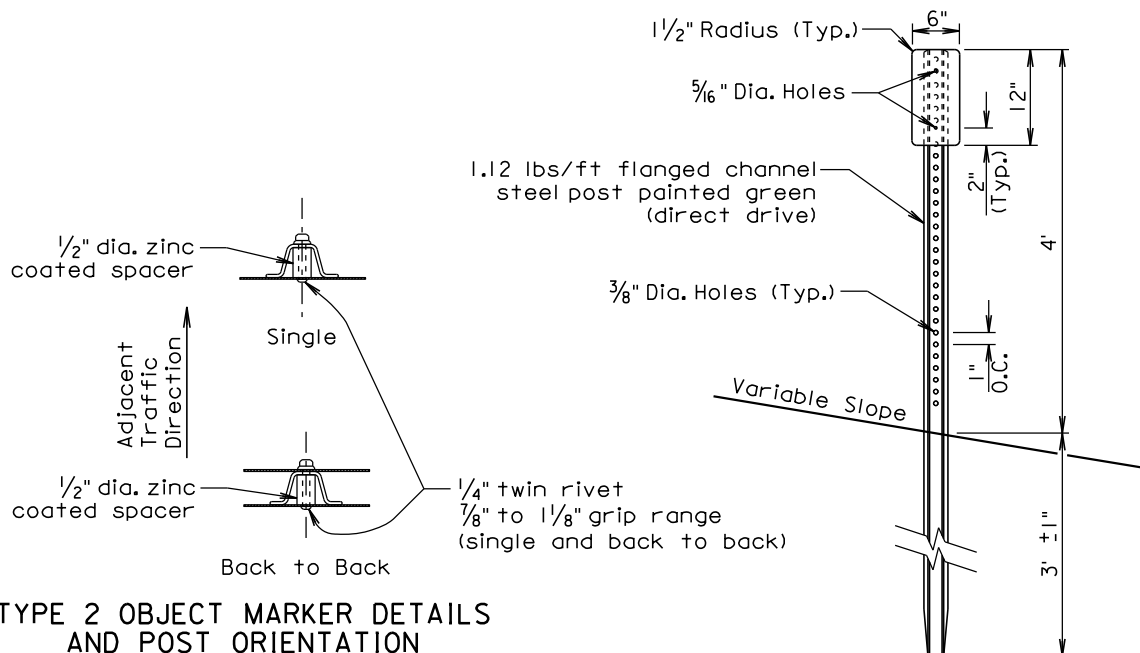
\*\*\* Flexible delineators may be attached to post with manufacturer approved adhesive instead of bolts.

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

June 26, 2011

Published Date: 1st Qtr. 2013	S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
			Sheet 3 of 4

Guardrail Repair and/or Replacement Due To Damage On Interstate 90 In The Winner Area  
Project 000I-391  
PCN i2ru



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

**(M) TYPE 2 OBJECT MARKER**

( For Marking 3 Cable Guardrail Anchor )

**GENERAL NOTES:**

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

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

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

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

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

June 26, 2011

Published Date: 1st Qtr. 2013	<b>S D D O T</b>	<b>DELINEATION OF GUARDRAIL AT BRIDGES</b>	<b>PLATE NUMBER</b> <b>632.40</b>
			Sheet 4 of 4