

PLOT SCALE - 200,000,000:1,000,000

PLOTTED FROM - TRRC11951

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT NOS.
000I-469, 000N-469, & 000P-469
REGION 4
GUARDRAIL MAINTENANCE

GUARDRAIL REPAIR AT VARIOUS LOCATIONS
IN REGION 4 ON A DEMAND BASIS

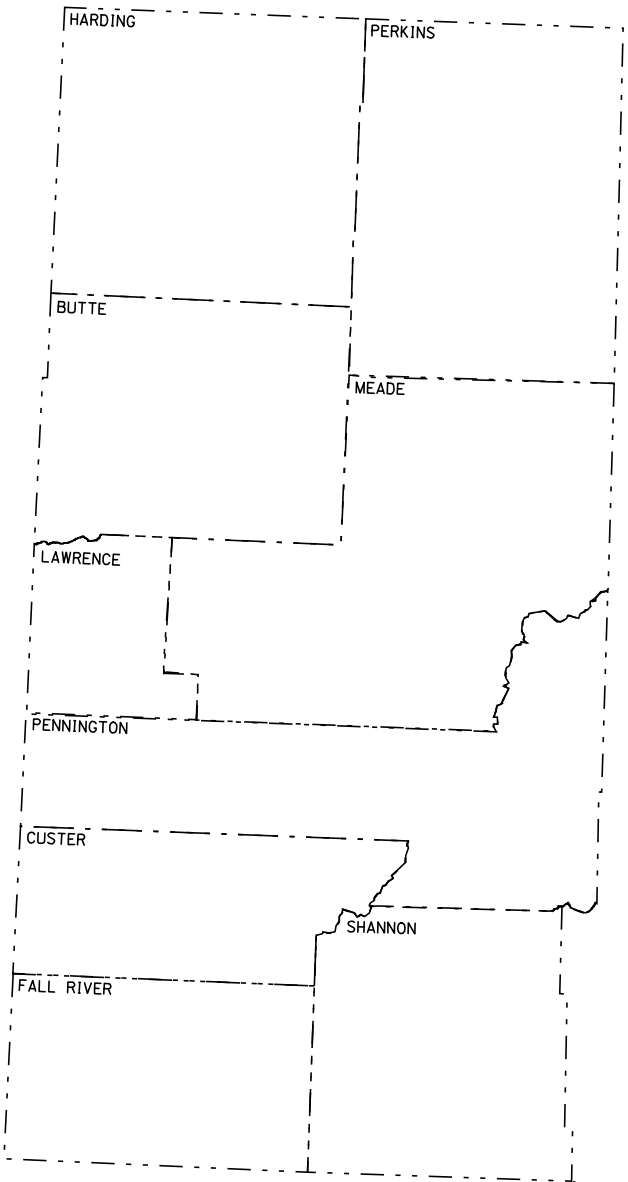
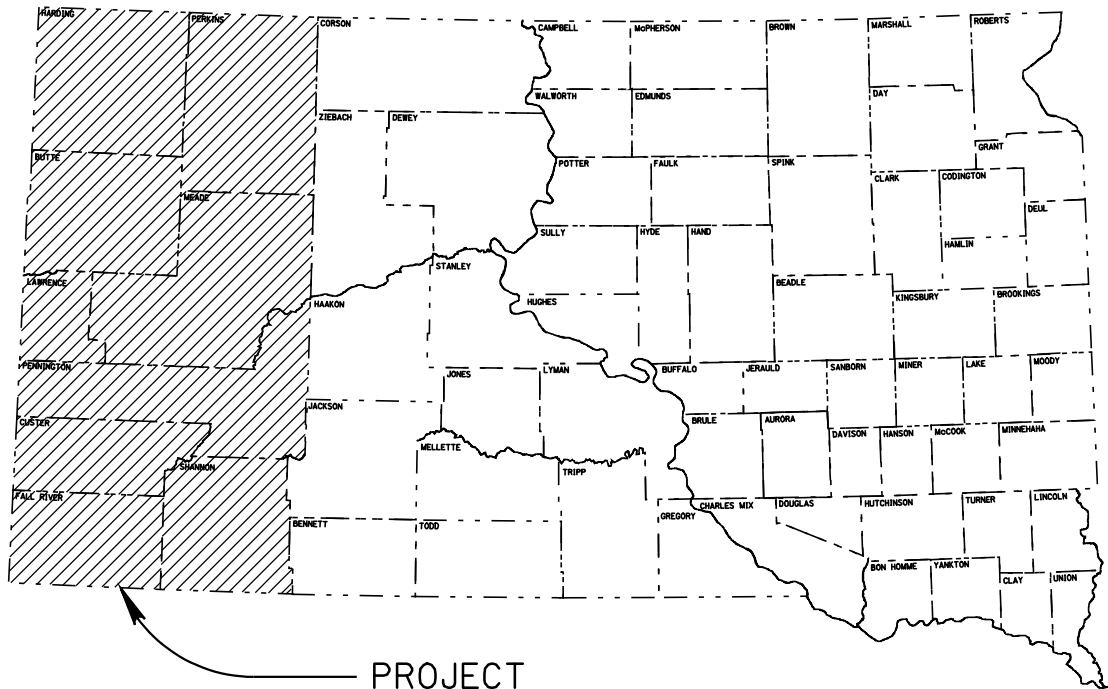
PCNs 11n0, 11n1, & 11n2

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-469 000N-469 000P-469		
		1	28

Plotting Date: 02-OCT-2009

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LEGEND

STATE AND NATIONAL LINE	— — — — —
COUNTY LINE	— — — — —
SECTION LINE	— — — — —
QUARTER LINE	— — — — —
SIXTEENTH LINE	— — — — —
PROPERTY LINE	— — — — —
CONSTRUCTION LINE	— — — — —
R. O. W. LINE	— — — — —
WORK LIMITS	- - - - -

FILE - U:\REGIONRC\PR\2010RC\GMAINT\PLANS\2010 GUARDRAIL\GUARDRAIL TITLEPS\BEE11951NEN - GUARDRAIL TITLE SHEET

ESTIMATE OF QUANTITIES

Bid Item Number	Item	Quantity	Unit
009E0197	Mobilization 1 (Belle Fourche Area)	2	Each
009E0198	Mobilization 2 (Rapid City Area)	2	Each
009E0199	Mobilization 3 (Custer Area)	2	Each
110E0700	Remove 3 Cable Guardrail	25	Ft
110E0730	Remove Beam Guardrail	200	Ft
110E0770	Remove W Beam Guardrail Breakaway Cable Terminal	1	Each
110E0800	Remove W Beam Guardrail End Terminal	1	Each
110E6230	Remove W Beam Guardrail for Reset	25	Ft
629E0100	3 Cable Guardrail	100	Ft
629E0300	3 Cable Guardrail Slip Base Anchor Assembly	2	Each
629E1000	Repair 3 Cable Guardrail	1000	Ft
629E1100	3 Cable Guardrail End Post	10	Each
629E1102	3 Cable Guardrail Intermediate Post	120	Each
629E1104	3 Cable Guardrail Post, Winter	50	Each
629E1106	Drive Down 3 Cable Guardrail Post	25	Each
629E1110	Cable Anchor Bracket	1	Each
629E1112	Cable Splice	4	Each
629E1114	3 Cable Guardrail J Hook Bolt	300	Each
629E1116	Steel Turnbuckle Cable End Assembly	2	Each
629E1118	Spring Cable End Assembly with Turnbuckle	5	Each
629E1120	W Beam to 3 Cable Transition Bracket	2	Each
629E1122	3 Cable Guardrail End Post Cap	15	Each
630E0200	Straight Class A Thrie Beam Rail	25	Ft
630E0210	Straight Class B Thrie Beam Rail	25	Ft
630E1150	Straight Double Class B W Beam Guardrail with Wood Posts	12.5	Ft
630E1200	Straight Class A W Beam Rail	250	Ft
630E1210	Straight Class B W Beam Rail	100	Ft
630E2000	W Beam to Thrie Beam Guardrail Transition	1	Each
630E2015	W Beam Guardrail Flared End Terminal	2	Each
630E2020	W Beam Guardrail Tangent End Terminal	2	Each
630E2030	W Beam Guardrail Breakaway Cable Terminal	2	Each
630E2110	Beam Guardrail Post and Block	30	Each
630E2120	Beam Guardrail Post and Block, Winter	20	Each
630E2205	Breakaway Cable Terminal End Post	1	Each
630E2210	Breakaway Cable Terminal End Rail	1	Each
630E2215	W Beam Guardrail End Section Buffer	2	Each
630E5120	Reset Thrie Beam Rail	12.5	Ft
630E5160	Reset W Beam Rail	25	Ft
630E5170	Reset Double W Beam Rail	12.5	Ft
630E5520	Drive Down Beam Guardrail Post	10	Each
630E5550	Reset Beam Guardrail Post and Block	15	Each
634E0010	Flagging	10	Hour
634E0125	Traffic Control for Guardrail Repair	6	Site
634E0420	Type C Advance Warning Arrow Panel	1	Each

WORK DESCRIPTION

Work on the contract shall include the following:

1. Repair of guardrail at various locations in Region 4 on a demand basis.

SPECIFICATIONS

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

MINIMUM WAGE RATES

The Special Provision regarding Minimum Wage on State Funded Projects shall be applicable if the amount of this contract, as awarded, is \$100,000 or more.

CONTRACT TIME PROVISIONS

1. The contract will become effective on date of award and will expire on September 30, 2010.
2. At such time as repairs are required, the Contractor will be notified. The Contractor will have 7 calendar days to complete the repairs.

MOBILIZATION

If more than one location within an area is to be repaired, the Contractor will be compensated for only one mobilization per area.

Mobilization 1 is the cost of mobilization per each time the Contractor is called in by the Belle Fourche Area Engineer, or his designated representative, to perform guardrail repair within the Belle Fourche Area.

Mobilization 2 is the cost of mobilization per each time the Contractor is called in by the Rapid City Area Engineer, or his designated representative, to perform guardrail repair within the Rapid City Area.

Mobilization 3 is the cost of mobilization per each time the Contractor is called in by the Custer Area Engineer, or his designated representative, to perform guardrail repair within the Custer Area

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.

Guardrail repairs will be limited to all Interstate and State highways within the boundaries of Region 4.

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.

The plan quantity for Traffic Control is 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.

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 high intensity flashing or revolving yellow light to warn the traveling public.

TRAFFIC CONTROL

1. All necessary traffic control signs and Type C Arrow Panels shall conform to the Manual of Uniform Traffic Control Devices and will be supplied and erected by the Contractor. The cost for all signing and flagging shall be paid for at the contract unit price per site for Traffic Control for Guardrail Repair.
2. Type C Advance Warning Arrow Panels will be paid for at the contract unit price per each when used for traffic control at guardrail repair sites.
3. Traffic control shall at all times meet applicable MUTCD Standards, these plans and Section 634 of the Standard Specifications.

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.

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. 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. Cost for reshaping, leveling, tilling, and seeding disturbed areas on the slopes and berms shall be incidental to the contract unit price for the various items.

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 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 prices for the respective bid items. All W Beam guardrail end terminals that are replaced shall meet the requirements of NCHRP Report Number 350 Test Level 3.
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 - Includes the additional cost for removal and installation of a Beam Guardrail Wood Post and Block when there is in excess of one foot of solid frozen ground at the work site. This unit price will be an additional payment (i.e. the Contractor will be paid once for the respective Beam Guardrail Post and Block bid item and once for Beam Guardrail Post and Block, Winter for each post when the Engineer determines winter conditions apply).
5. 3 Cable Guardrail Post, Winter - Includes the additional costs for removal and installation of a 3 Cable I Beam Steel and 3 Cable Flanged Channel Post when there is in excess of one foot of solid frozen ground at the work site. This unit price will be an additional payment (i.e. the Contractor will be paid once for the respective 3 Cable Guardrail Post bid item and once for 3 Cable Guardrail Post, Winter for each post when the Engineer determines winter conditions apply).
6. All reset portions of W & Thrie Beam Guardrail sections shall include the removal of wood guardrail posts and resetting the posts to proper alignment with the Steel beam Guardrail. Payment for this work will be the same in frozen or unfrozen ground.

GUARDRAIL (CONTINUED)

7. Repair 3 Cable Guardrail – Includes all costs of 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 the cable is replaced, broken cable repaired, or the existing cable rail required realigning and retensioning.
8. "3 Cable Guardrail Intermediate Post" includes all costs to furnish and install either I Beam or 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 all costs to furnish and install 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. W Beam Guardrail Breakaway Cable Terminal will be repaired only when they are behind 3 Cable Guardrail. W Beam Guardrail Breakaway Cable Terminal - Includes the costs of removing damaged components of the BCT System, furnishing and installing new Wood Breakaway End Posts (2), W Beam End Section (Buffer) 11” ± radius, related items and all hardware to attach same. Any other BCT items that are required will be paid for at invoice cost plus shipping, taxes and ten percent for profit.
11. W Beam Guardrail BCT's or MELT's that are damaged that are not behind 3 Cable guardrail will be replaced with a new W Beam Guardrail End Terminal. If the existing rail is in a tangent section it will be replaced with one of the following W Beam Tangent End Terminals.

ET 2000 produced by Trinity Industries, Inc.

SKT 350 produced by Road Systems Inc.

If the existing rail is in a flared section it will be replaced with one of the following W Beam Flared End Terminals.

SRT-350 produced by Trinity Industries, Inc.

Fleat 350 produced by Road Systems Inc.
12. 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 items shall be incidental to the contract unit prices for the various items.
- 13 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 in Rapid City. 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.

GUARDRAIL (CONTINUED)

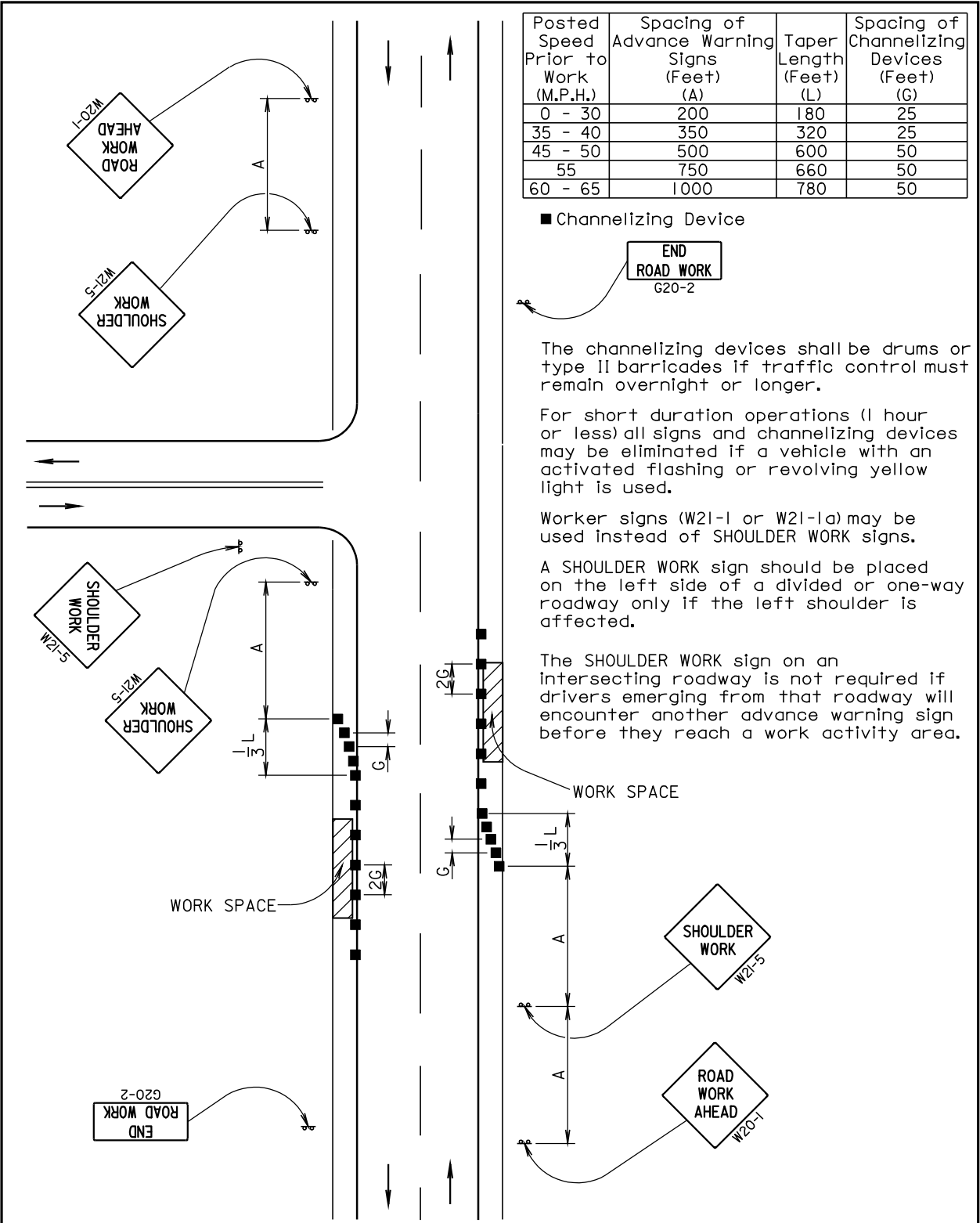
- 14 All costs to furnish and install new bolts, nuts, washers, nails, misc. shall be absorbed in the various other bid items.

All removed guardrail items that are not reused shall become the property of the Contractor.

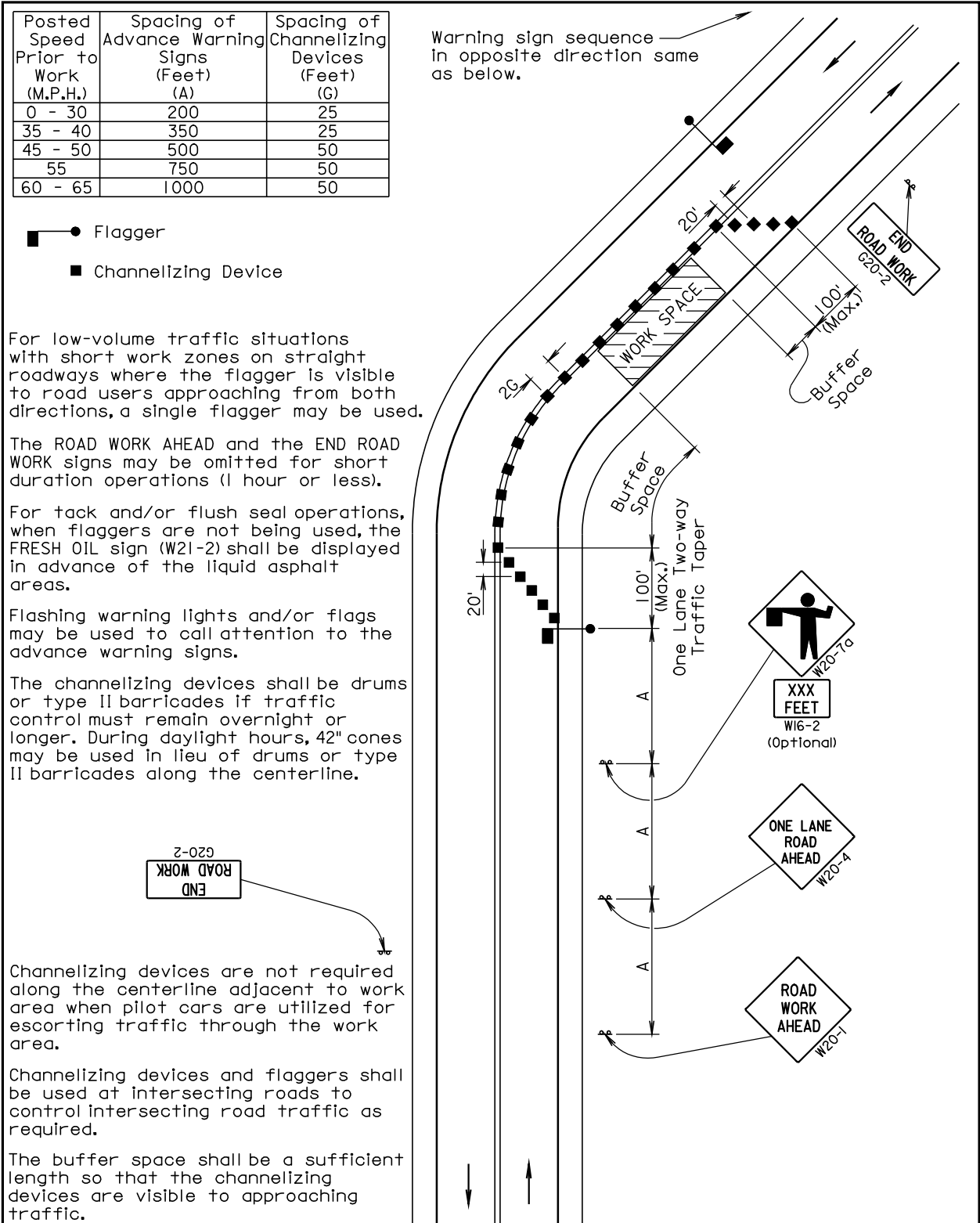
PROGRESS PAYMENTS

Progress payments will be prepared monthly in accordance with Section 9.7 of the Standard Specifications. Estimates may be paid twice each month if the Engineer and Contractor agree that sufficient quantity of work has been performed to warrant a shorter pay period.

Plotting Date: 05-OCT-2009



July 1, 2005



June 26, 2006

Plotting Date: 05-OCT-2009

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)			Taper Length (Feet)	Spacing of Channelizing Devices (Feet)
	(A)	(B)	(C)		
0 - 30	200			180	25
35 - 40	350			320	25
45 - 50	500			600	50
55	750			660	50
60 - 65	1000			780	50

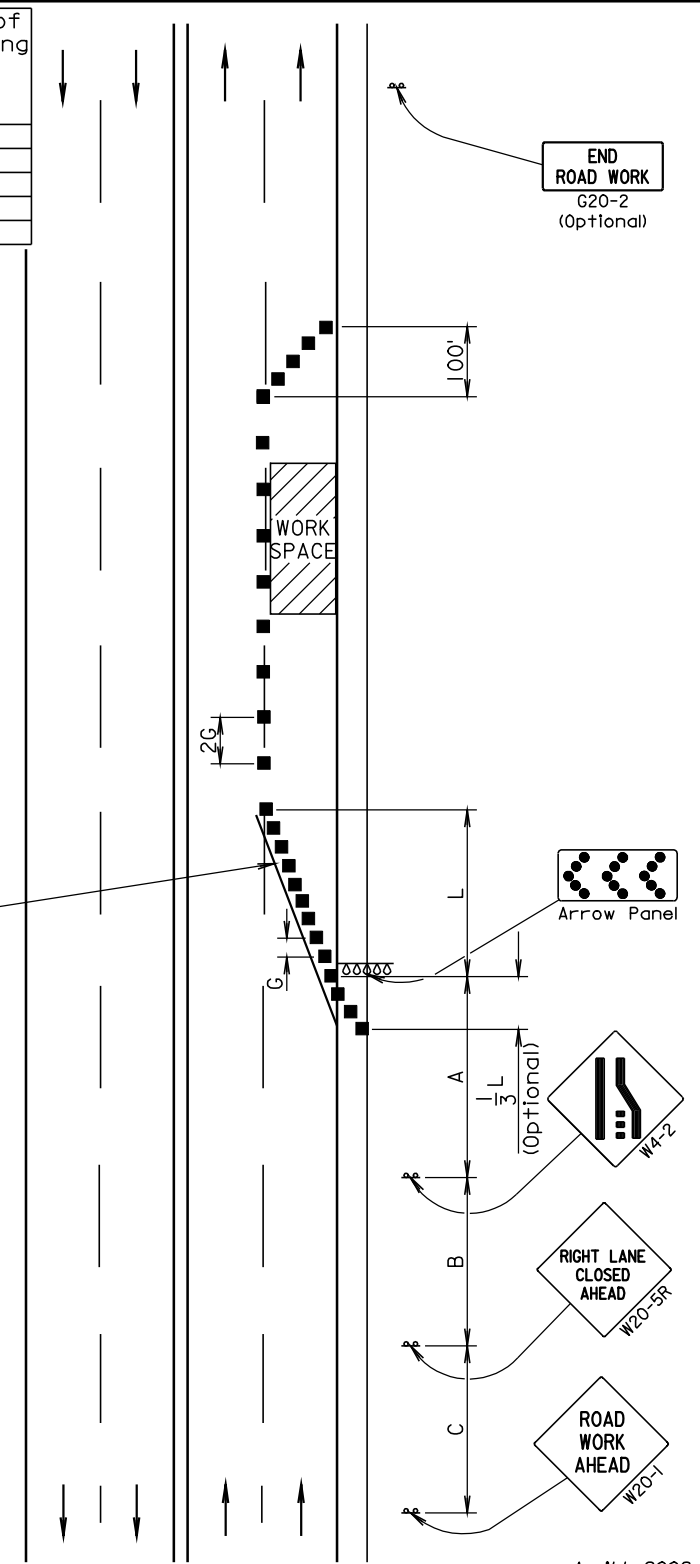
■ Channelizing Device

Drums or Type II Barricades shall be used if required overnight.

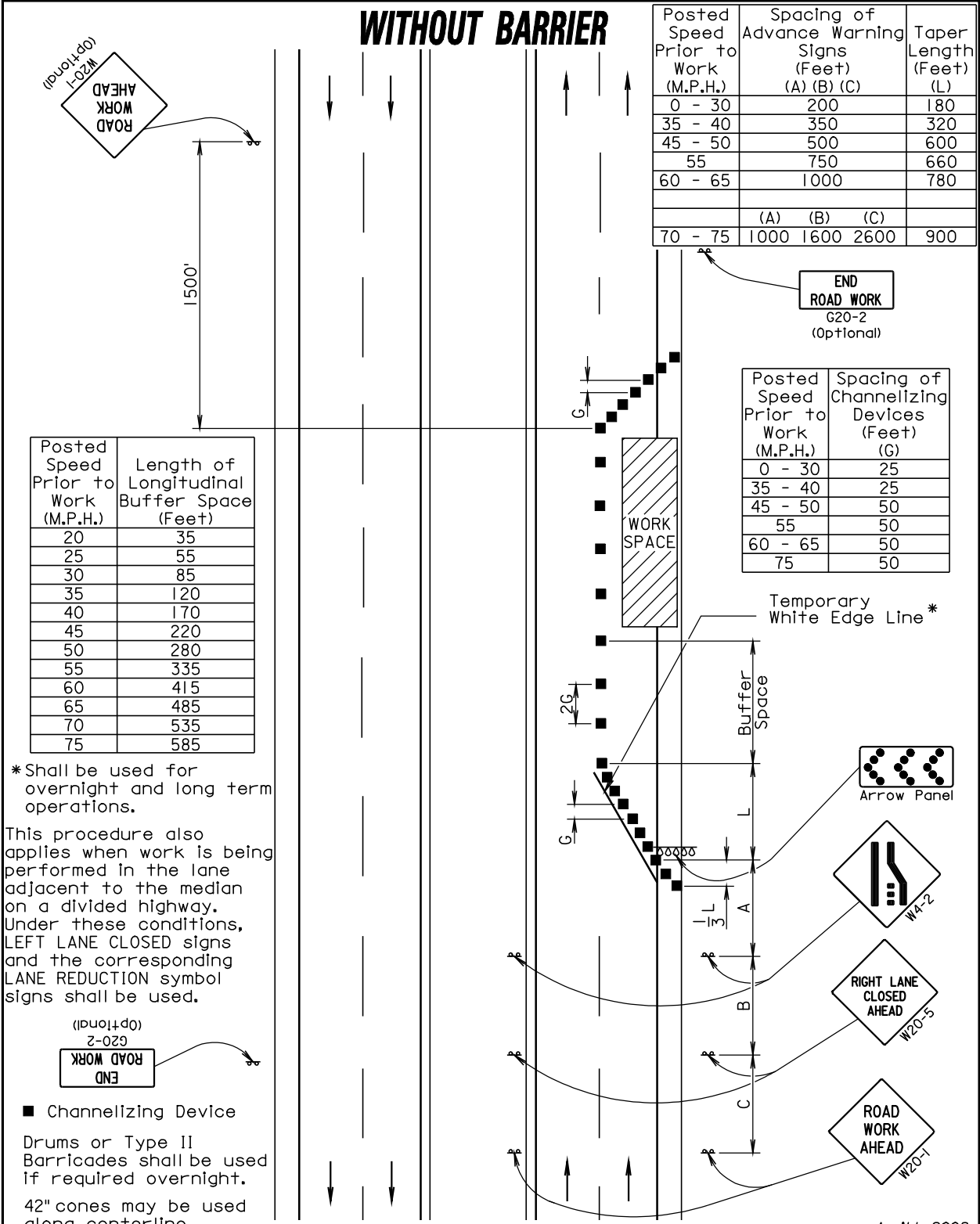
42" cones may be used along centerline

Longitudinal dimensions may be adjusted to fit project conditions such as horizontal curves, vertical curves, and other site restrictions.

Four inch white temporary pavement marking shall be used if traffic control must remain overnight or longer.



April 11, 2008



April 11, 2008

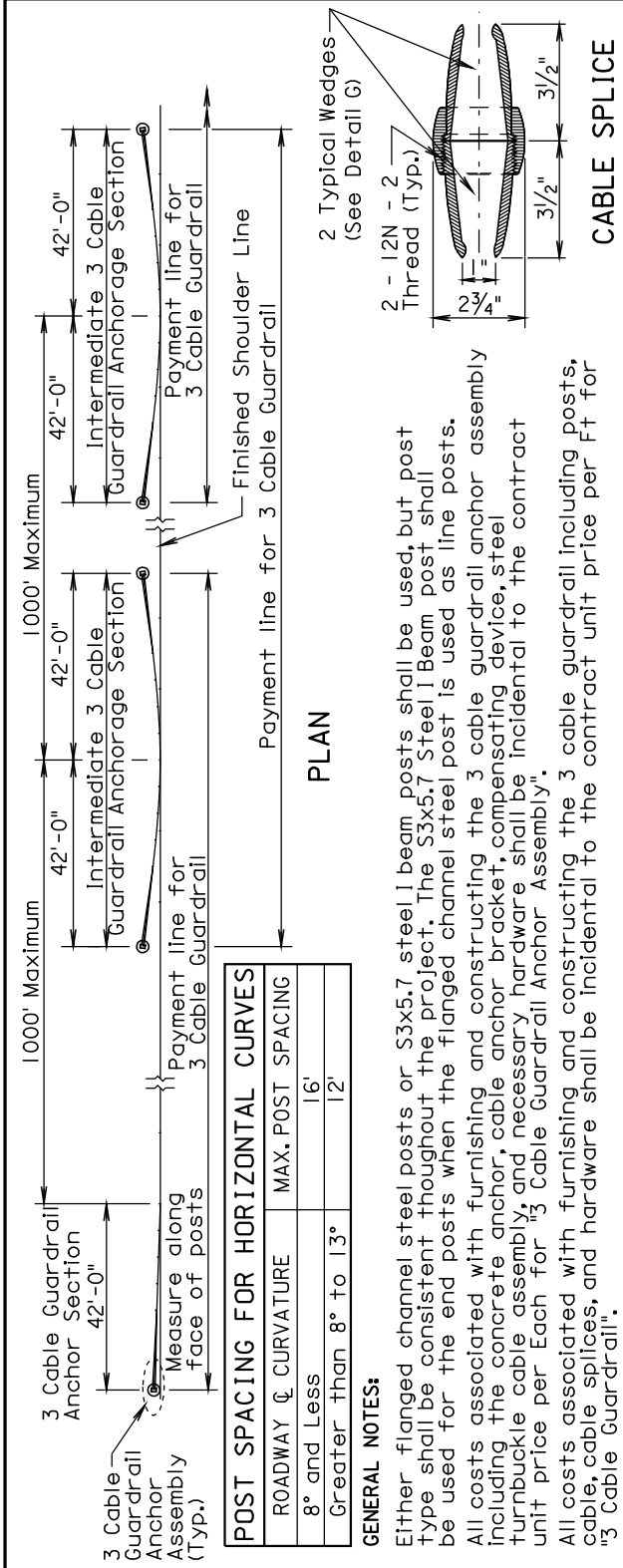
Published Date: 3rd Qtr. 2009

3 CABLE GUARDRAIL

3 CABLE GUARDRAIL

PLATE NUMBER
629.01

Sheet 1 of 6



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

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

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

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

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

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

March 28, 2001

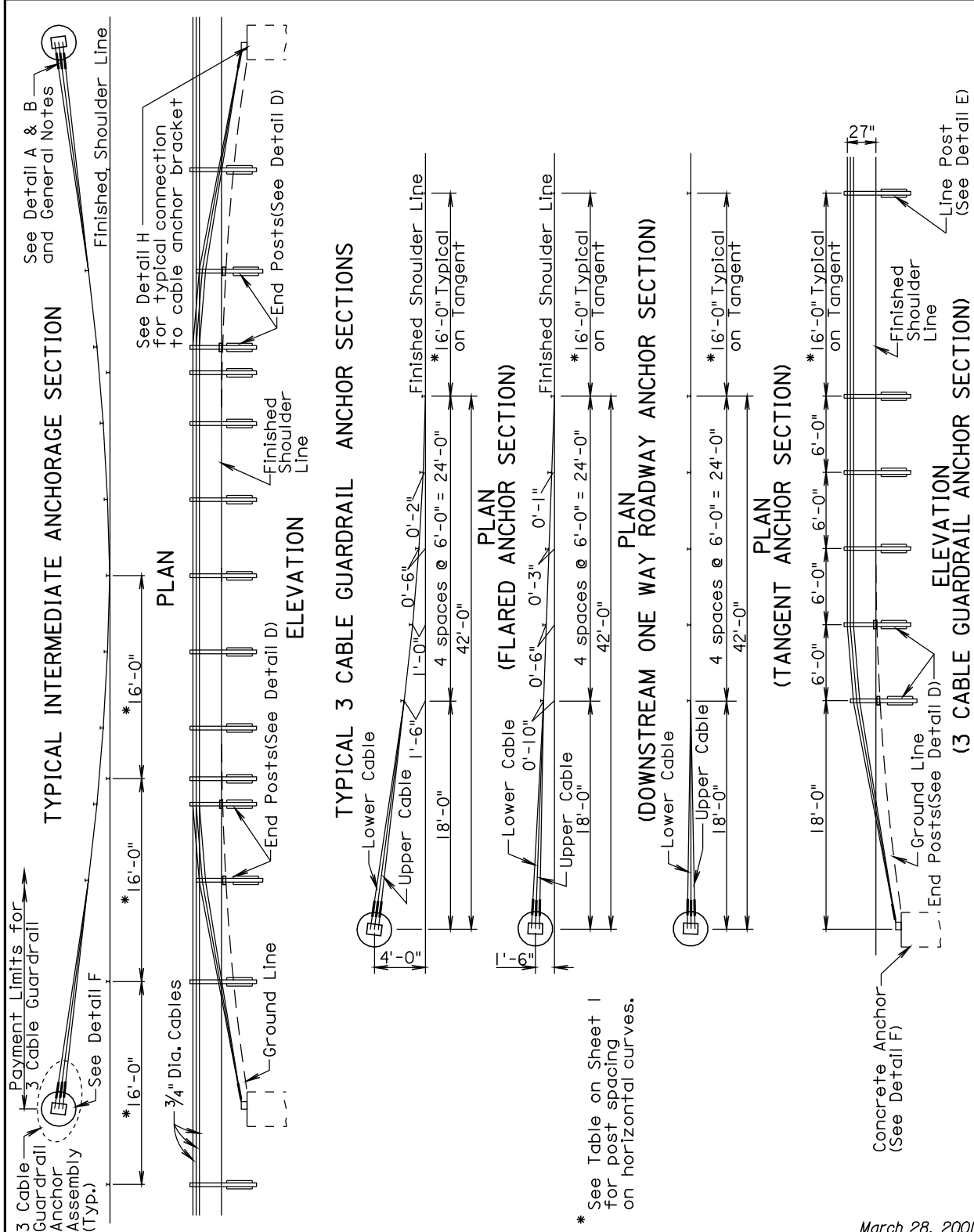
Published Date: 3rd Qtr. 2009

3 CABLE GUARDRAIL

3 CABLE GUARDRAIL

PLATE NUMBER
629.01

Sheet 2 of 6



March 28, 2001

Published Date: 3rd Qtr. 2009

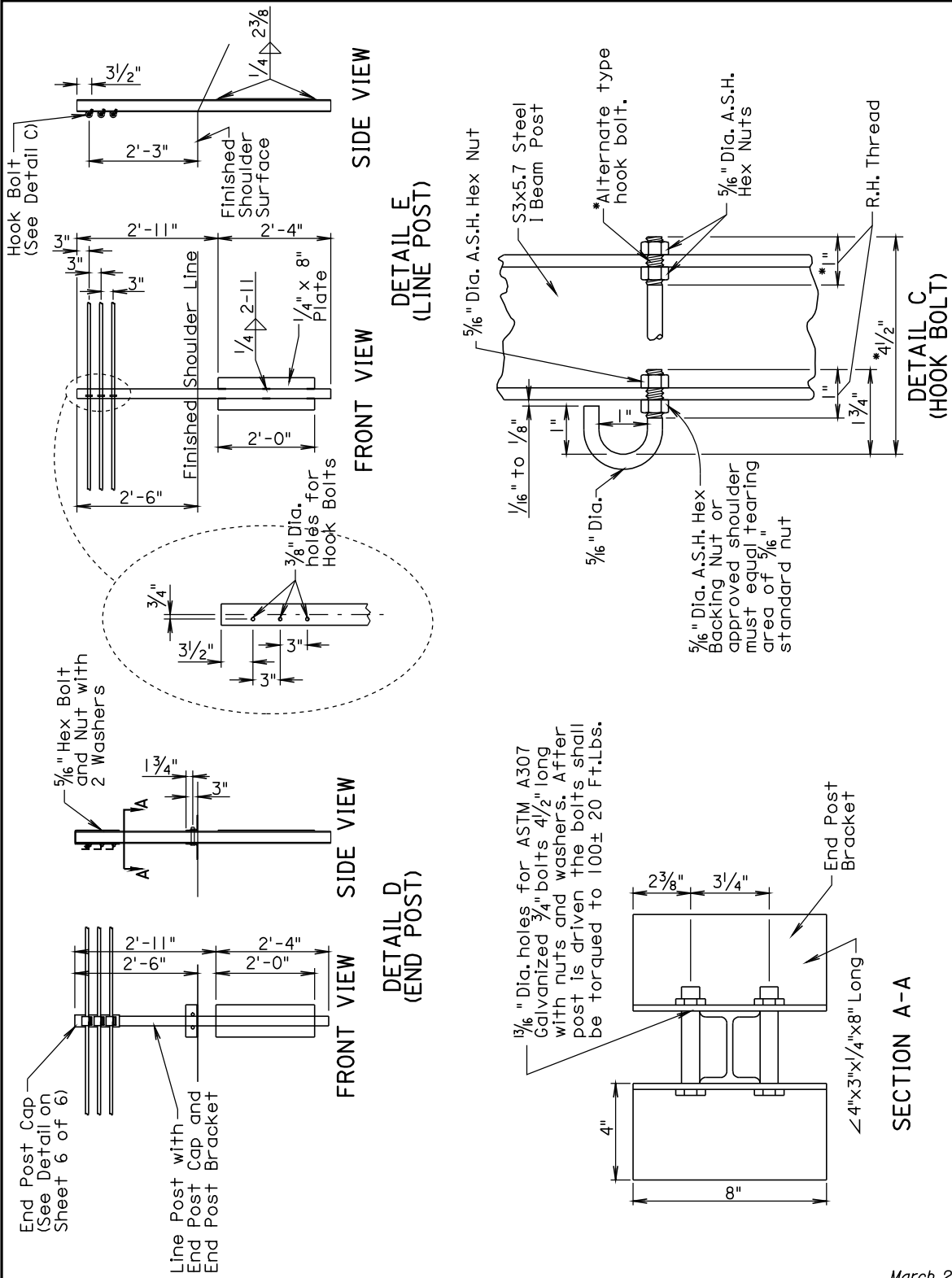
629.01

3 CABLE GUARDRAIL

PLATE NUMBER
629.01

Sheet 5 of 6

March 28, 2001



S3x5.7 STEEL I BEAM POST
FOR 3 CABLE GUARDRAIL

Published Date: 3rd Qtr. 2009

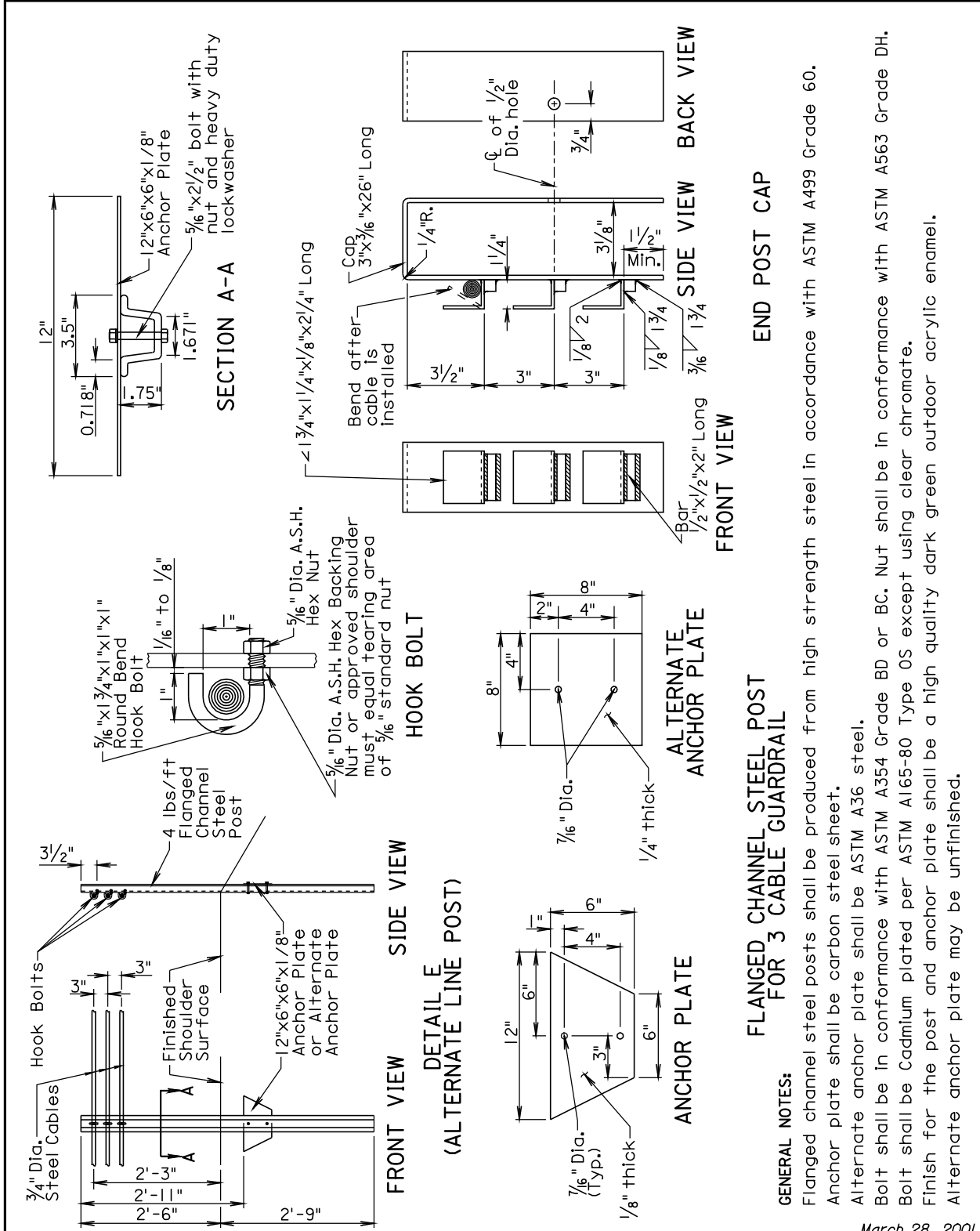
629.01

3 CABLE GUARDRAIL

PLATE NUMBER
629.01

Sheet 6 of 6

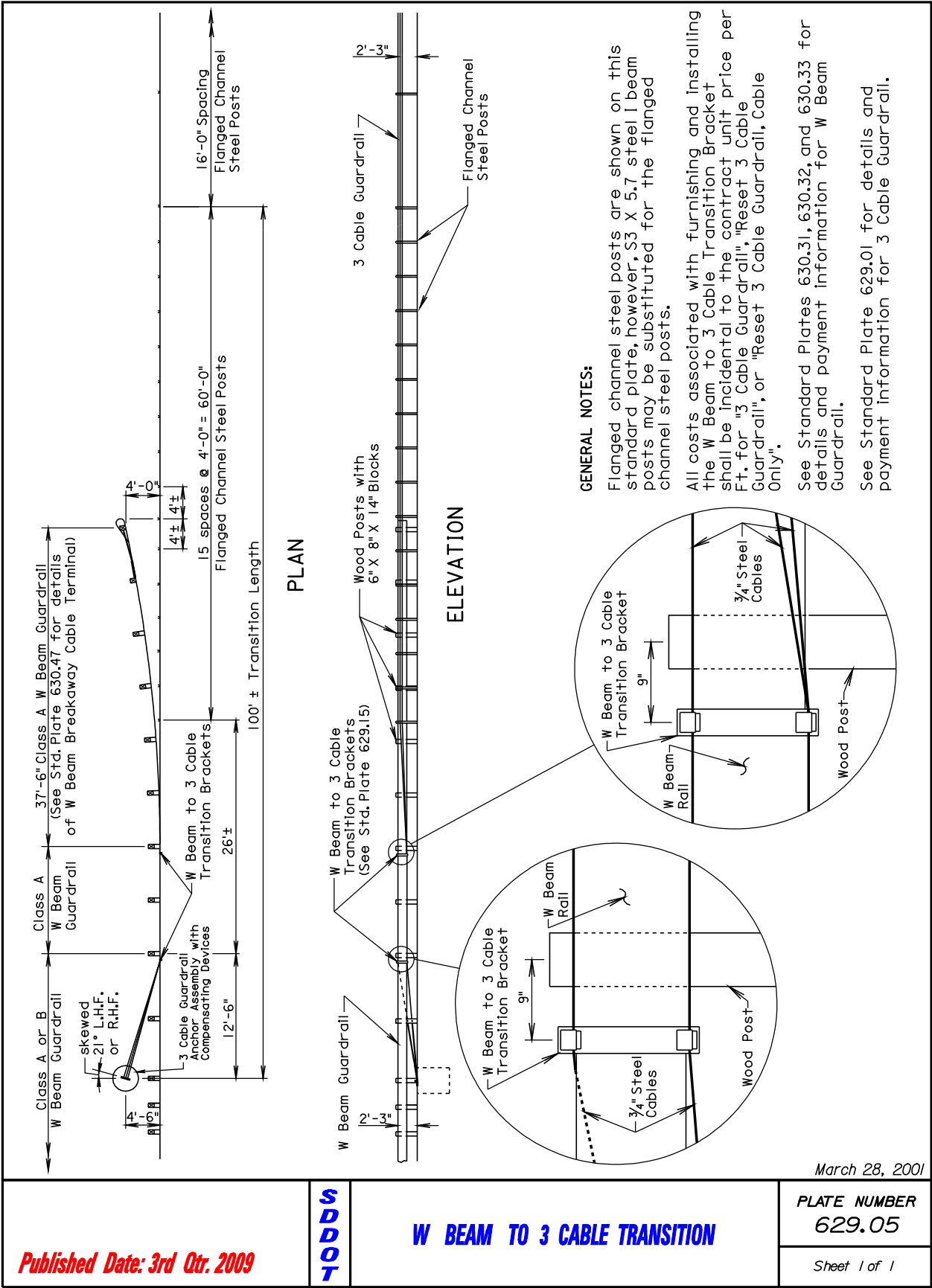
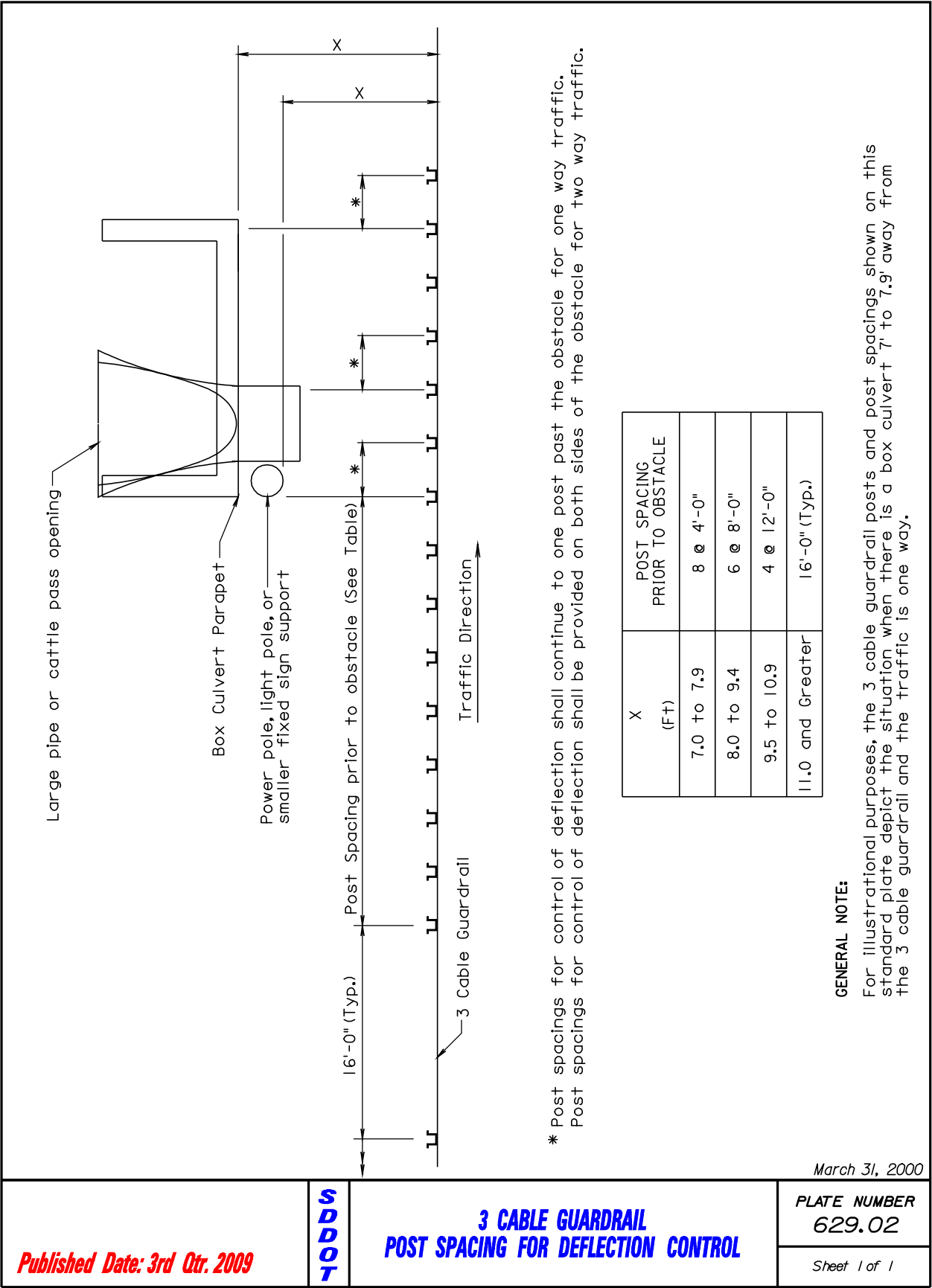
March 28, 2001



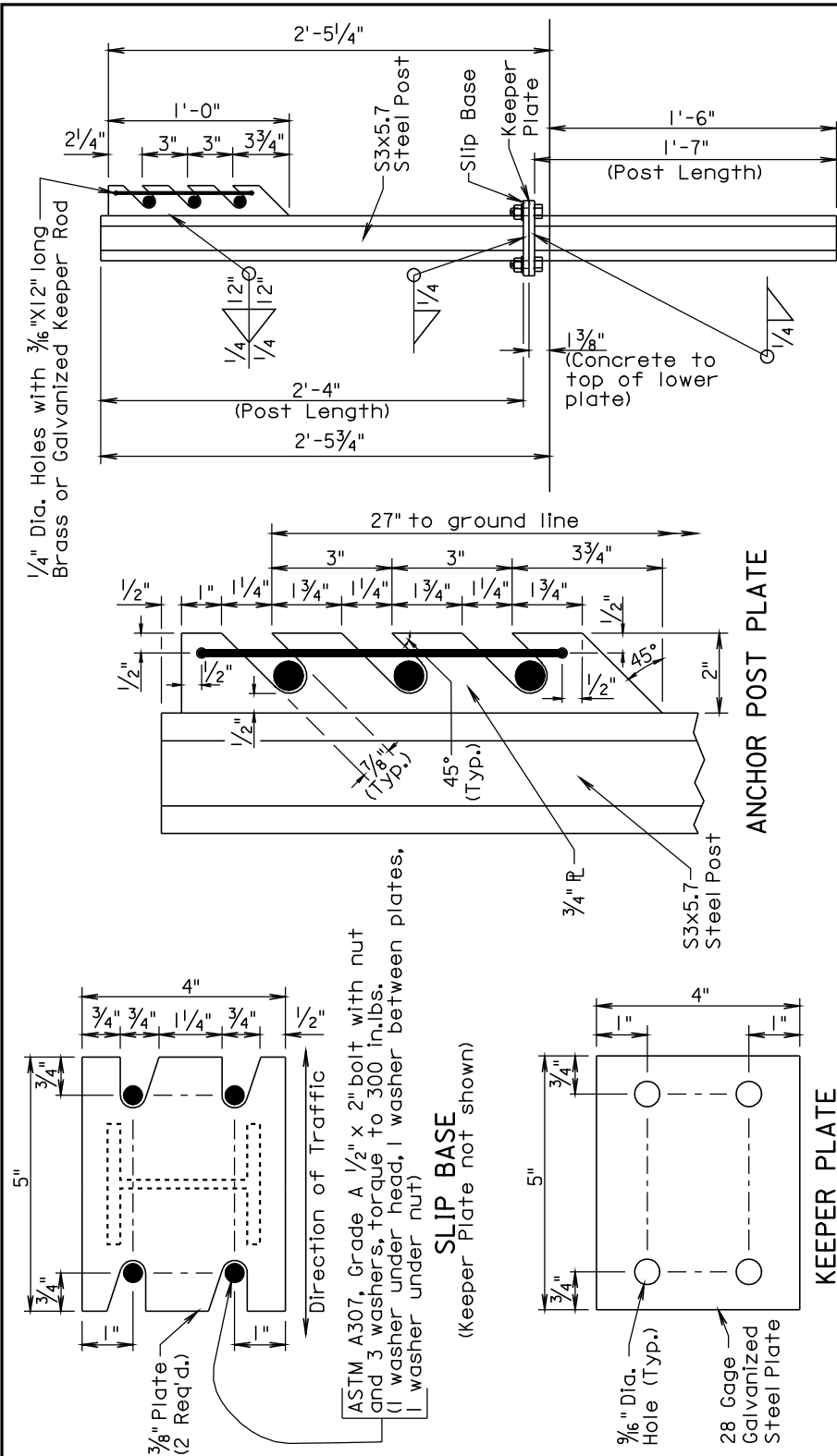
FLANGED CHANNEL STEEL POST
FOR 3 CABLE GUARDRAIL

GENERAL NOTES:

Flanged channel steel posts shall be produced from high strength steel in accordance with ASTM A499 Grade 60. Anchor plate shall be carbon steel sheet. Alternate anchor plate shall be ASTM A36 steel. Bolt shall be in conformance with ASTM A354 Grade BD or BC. Nut shall be in conformance with ASTM A563 Grade DH. Bolt shall be Cadmium plated per ASTM A165-80 Type OS except using clear chromate. Finish for the post and anchor plate shall be a high quality dark green outdoor acrylic enamel. Alternate anchor plate may be unfinished.



Plotting Date: 05-OCT-2009



ANCHOR POST

ANCHOR POST PLATE

SLIP BASE
(Keeper Plate not shown)

KEEPER PLATE

GENERAL NOTES:

Anchor post shall be a S3x5.7 rolled steel section. Post and plates shall conform to ASTM A36 and shall be galvanized in accordance with ASTM A123.

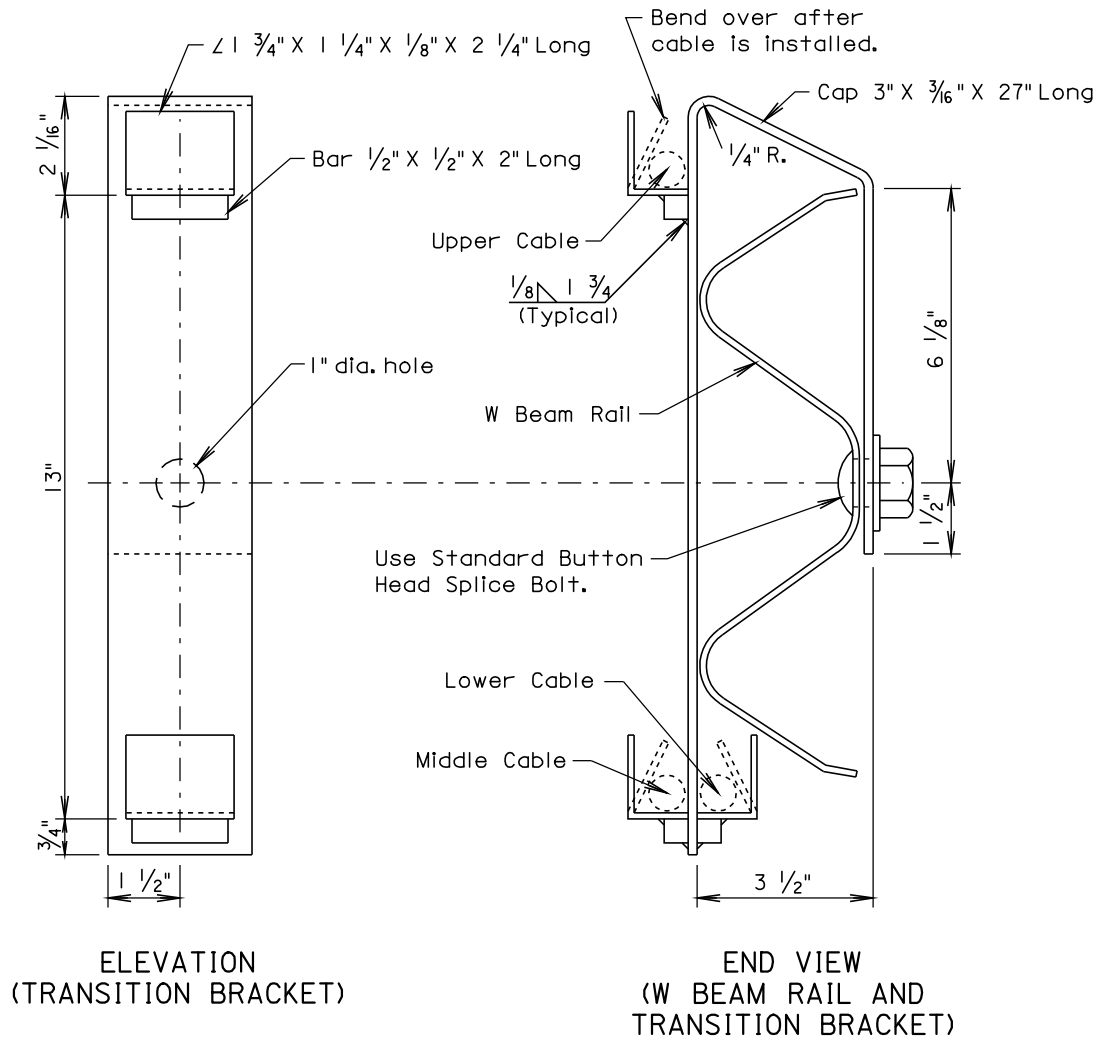
3/4" round wire cable shall consist of three strands (7 wires per strand) and have a minimum tensile strength of 25,000 pounds.

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

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

June 26, 2001

Published Date: 3rd Qtr. 2009	S D D O T	3 CABLE GUARDRAIL SLIP BASE ANCHOR ASSEMBLY	PLATE NUMBER
			629.10
			Sheet 3 of 3

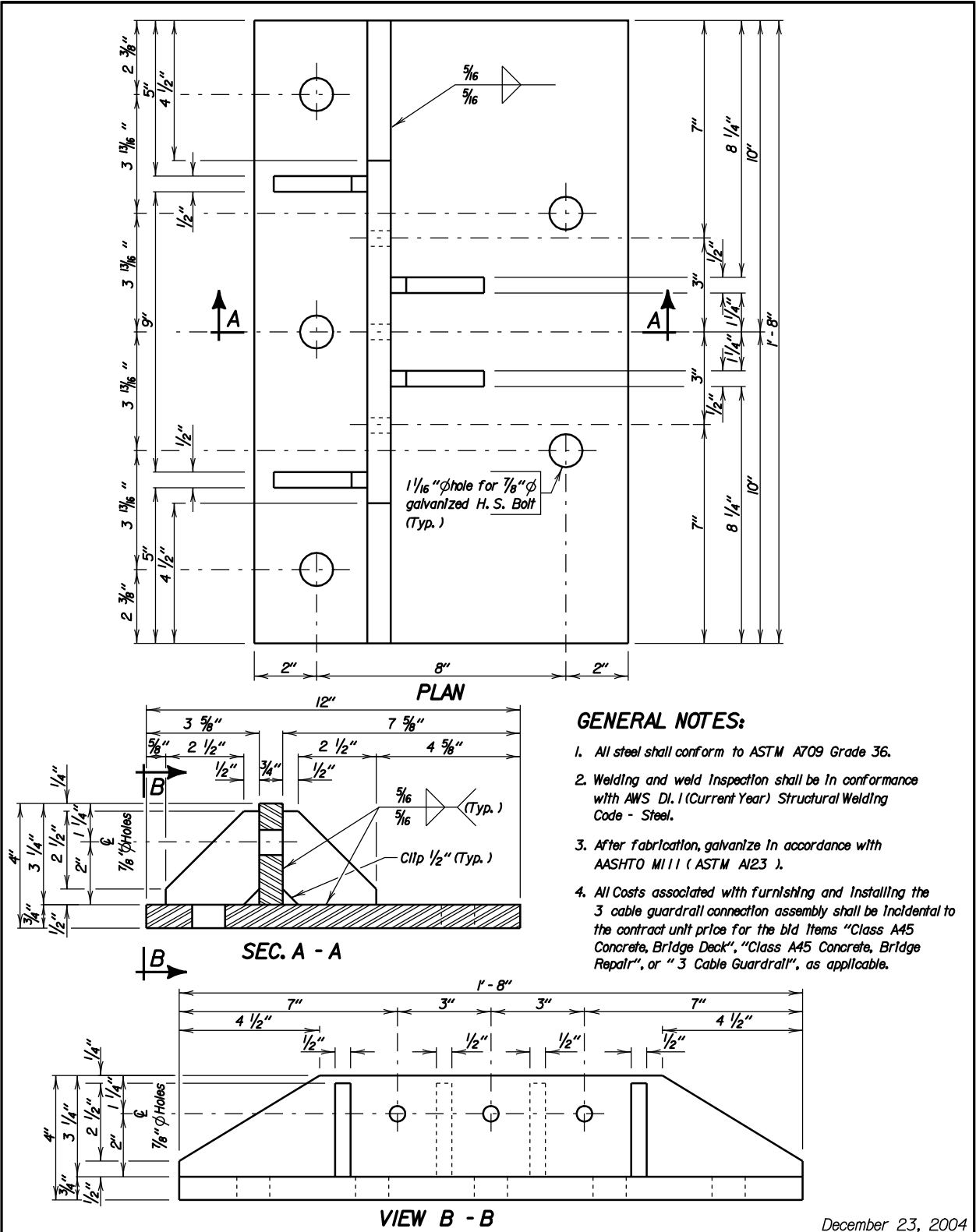


GENERAL NOTES:

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

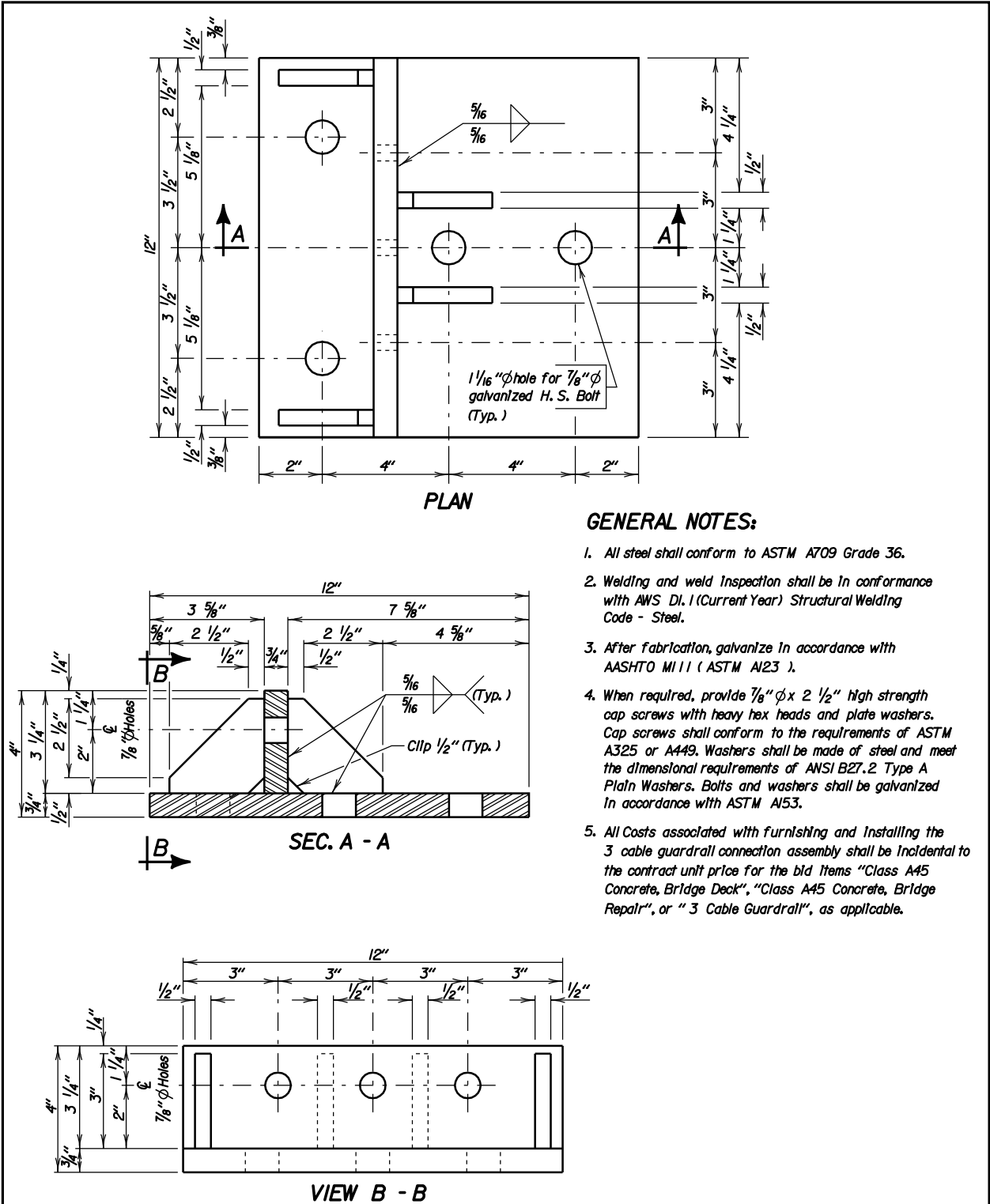
March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	W BEAM TO 3 CABLE TRANSITION BRACKET	PLATE NUMBER
			629.15
			Sheet 1 of 1



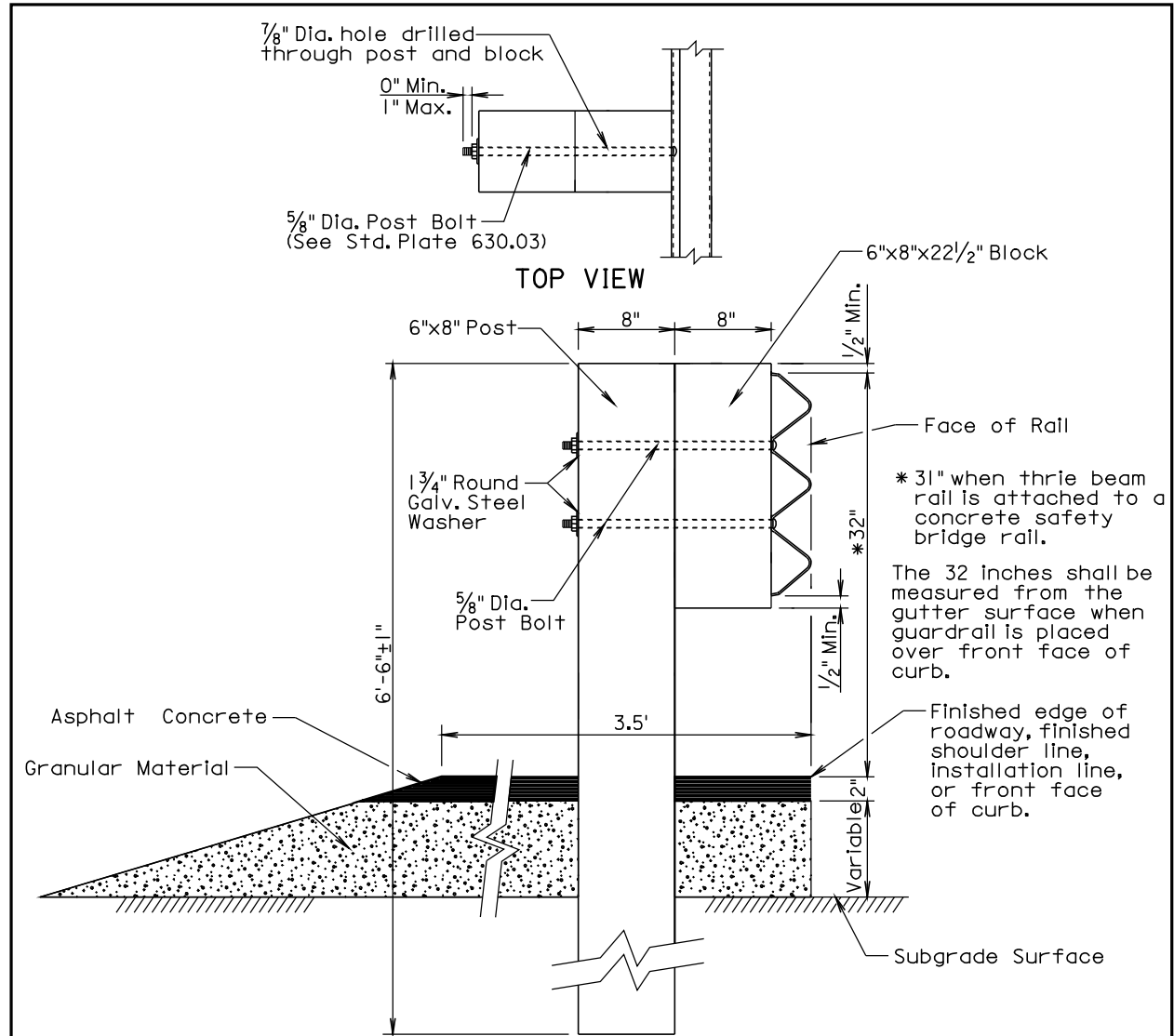
December 23, 2004

Published Date: 3rd Qtr. 2009	S D D O T	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER 629.30
			Sheet 1 of 1



December 23, 2004

Published Date: 3rd Qtr. 2009	S D D O T	3 CABLE GUARDRAIL CONNECTION ASSEMBLY	PLATE NUMBER 629.31
			Sheet 1 of 1



GENERAL NOTES:

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

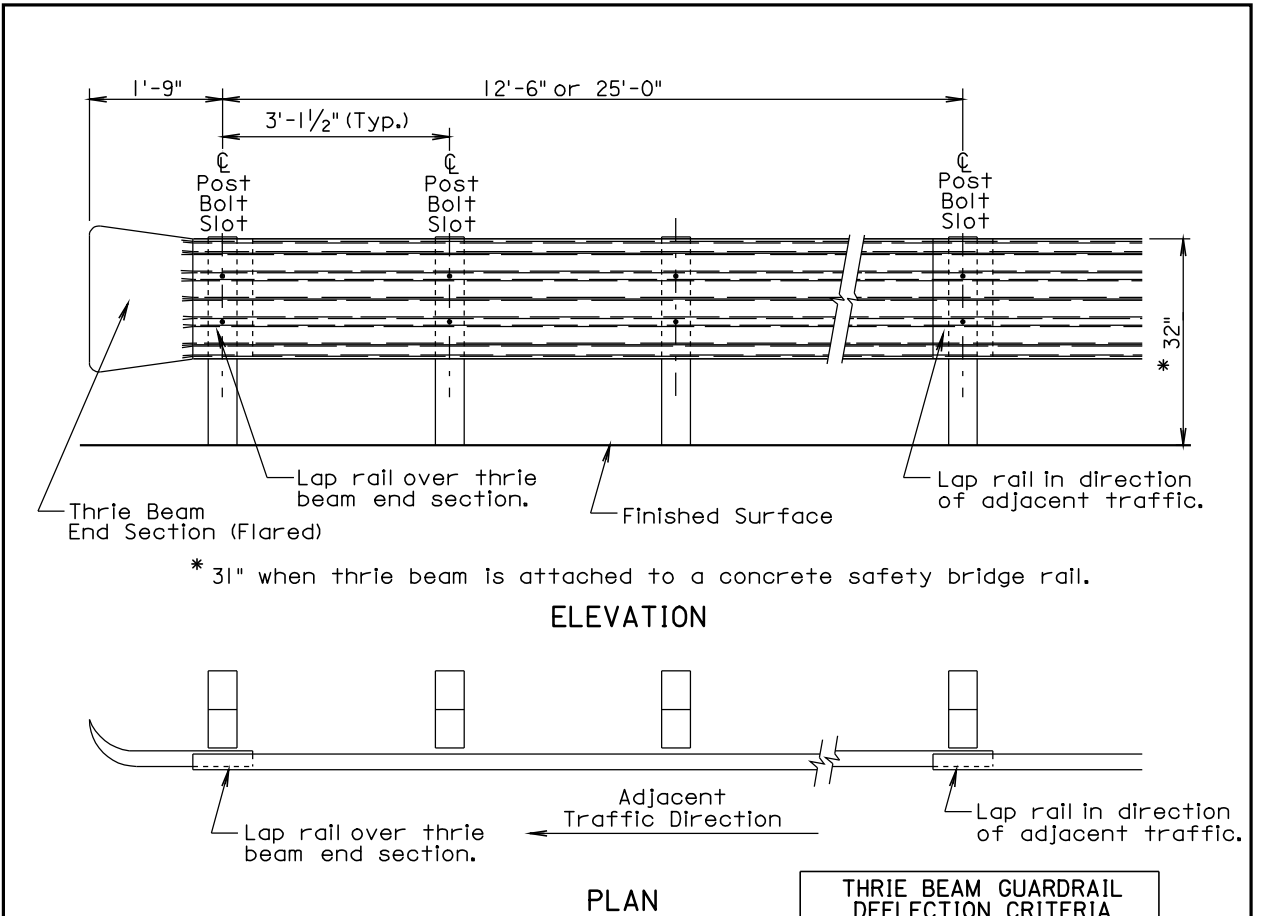
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "Thrie Beam Guardrail" bid item.

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.

March 31, 2000

Published Date: 3rd Qtr. 2009	SD DOT	THRIE BEAM GUARDRAIL POST INSTALLATION	PLATE NUMBER 630.01
			Sheet 1 of 1



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.

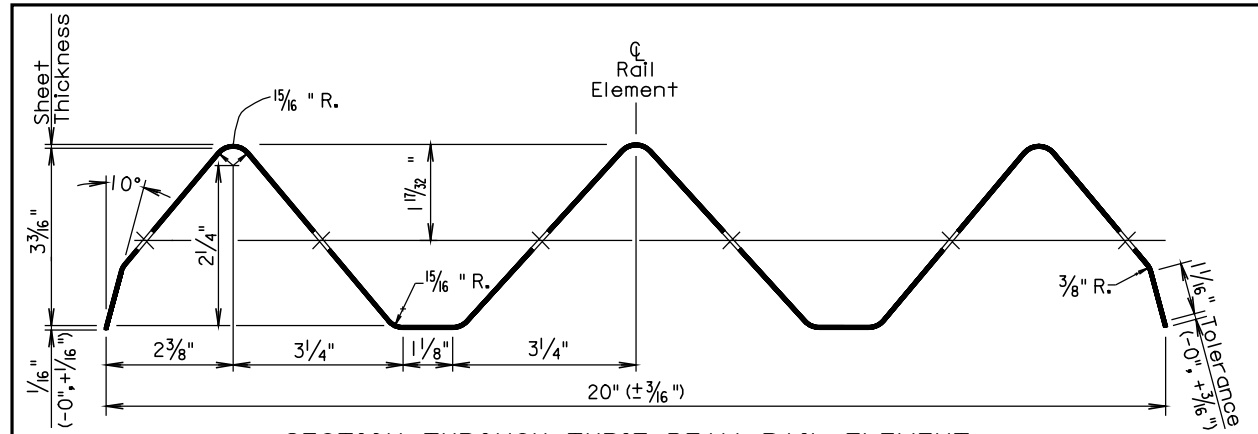
All costs for constructing thrie beam guardrail including labor, equipment, and materials including all posts, blocks, steel beam rail, and hardware shall be incidental to the contract unit price per foot for the respective "Thrie Beam Guardrail" bid item.

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

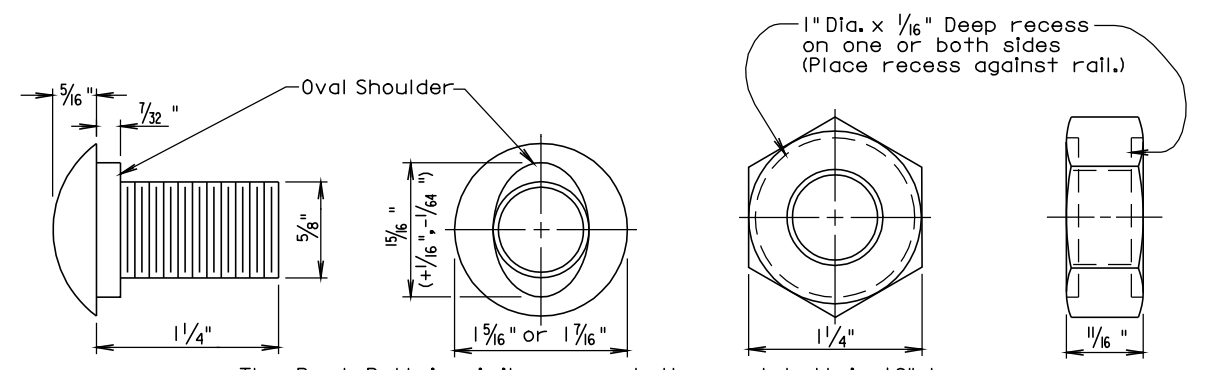
March 28, 2001

Published Date: 3rd Qtr. 2009	SD DOT	THRIE BEAM GUARDRAIL INSTALLATION	PLATE NUMBER 630.02
			Sheet 1 of 1

Plotting Date: 05-OCT-2009

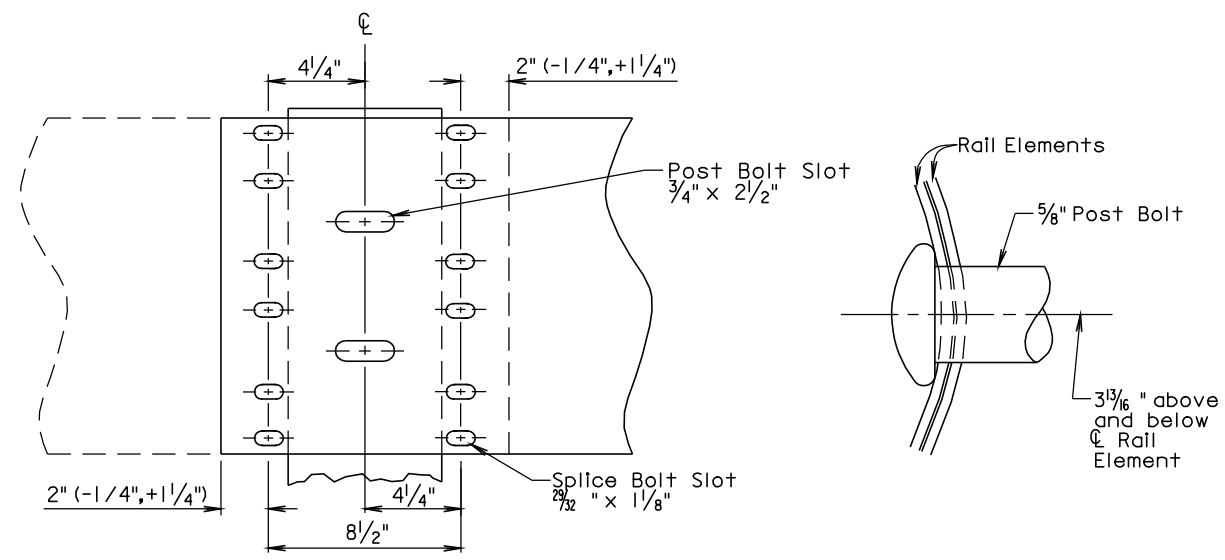


SECTION THROUGH THRIE BEAM RAIL ELEMENT



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

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

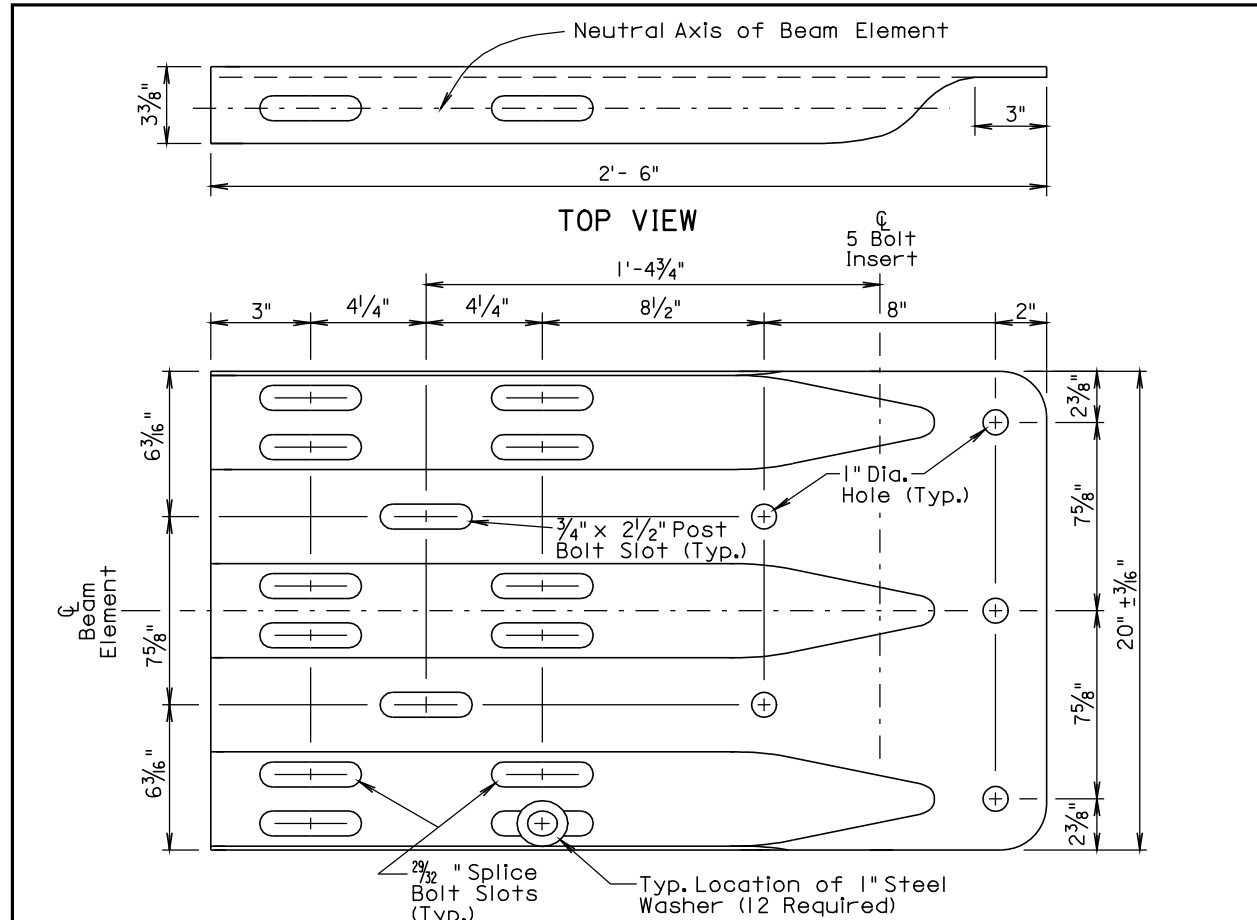


Lap in direction of traffic.

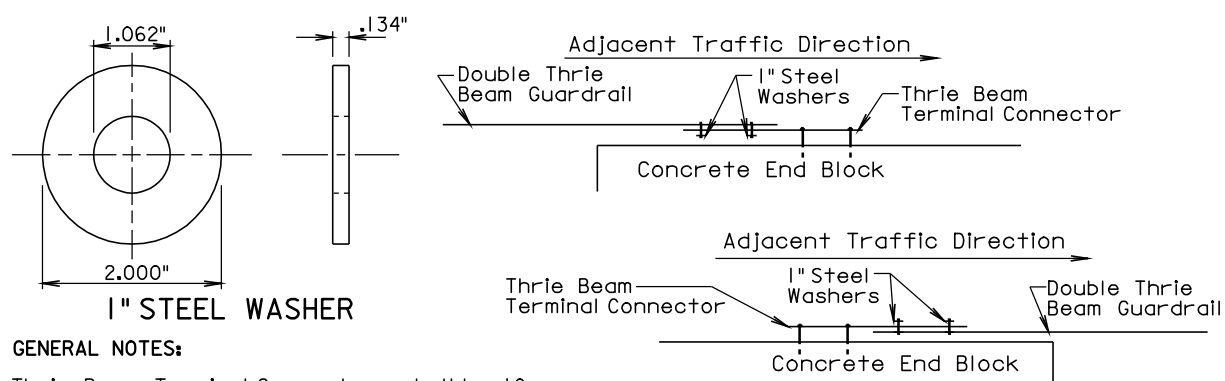
RAIL SPLICE

March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	THRIE BEAM RAIL, RAIL SPLICE, AND HARDWARE	PLATE NUMBER
			630.03
			Sheet 1 of 1



ELEVATION
THRIE BEAM TERMINAL CONNECTOR



GENERAL NOTES:

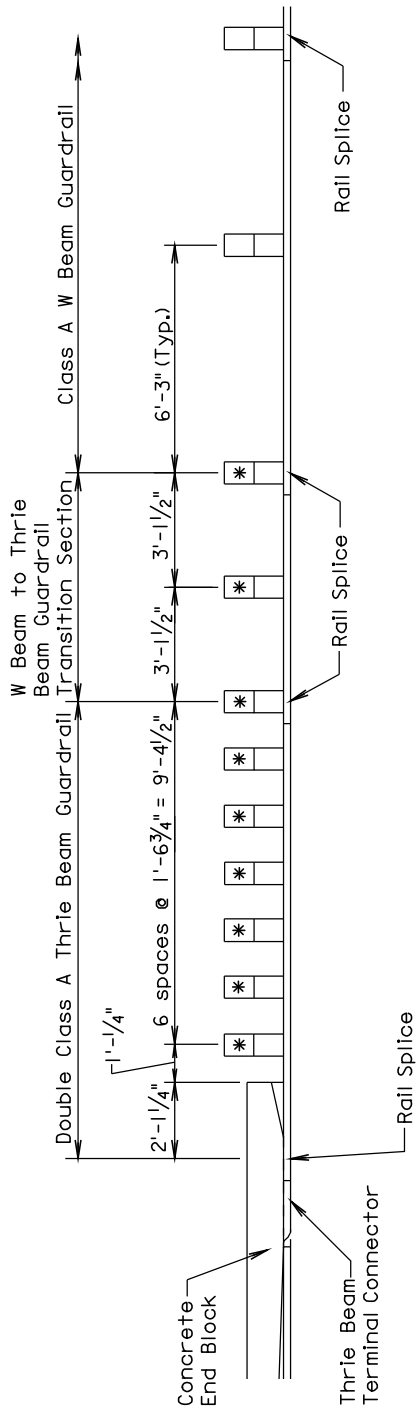
Thrie Beam Terminal Connectors shall be 10 gauge.

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

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

September 14, 2001

Published Date: 3rd Qtr. 2009	S D D O T	THRIE BEAM TERMINAL CONNECTOR AND 1 " STEEL WASHER	PLATE NUMBER
			630.05
			Sheet 1 of 1

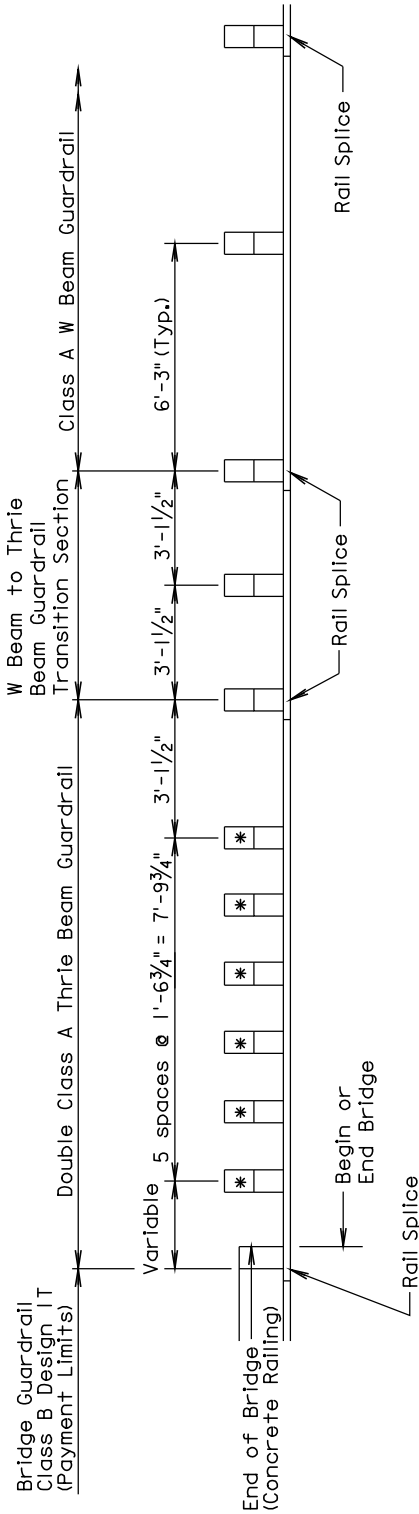


* 6" x 8" x 7' posts shall be used at these locations.

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

Published Date: 3rd Qtr. 2009	S D D O T	POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END	PLATE NUMBER
			630.15
			Sheet 1 of 1

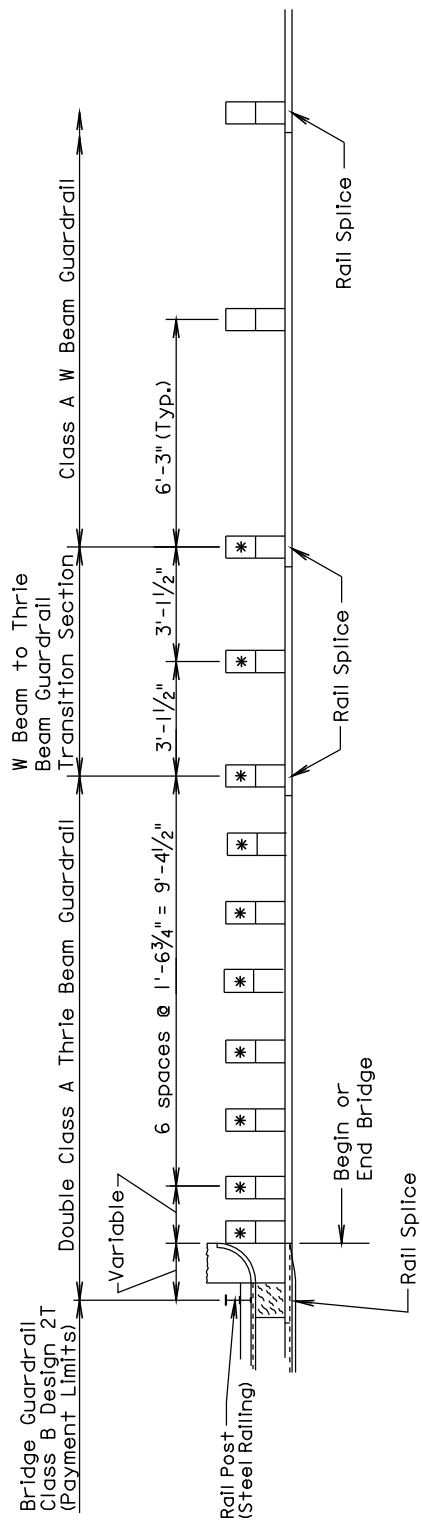


* 6" x 8" x 7' posts shall be used at these locations.

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END (BRIDGE GUARDRAIL DESIGN 1T)	PLATE NUMBER
			630.20
			Sheet 1 of 1



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

POST SPACING ARRANGEMENT FOR THRIE BEAM GUARDRAIL AT BRIDGE END

December 23, 2002

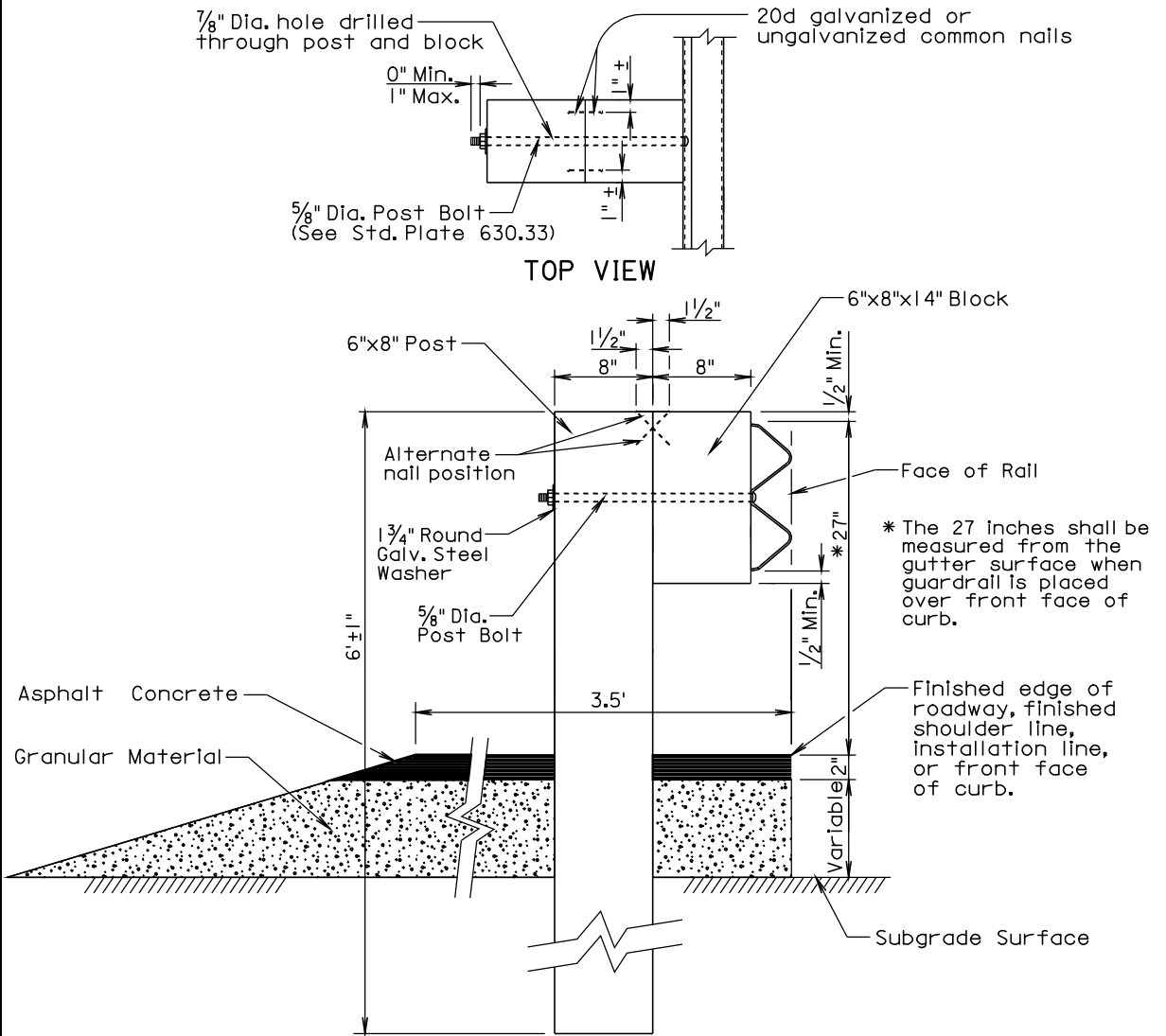
Published Date: 3rd Qtr. 2009

SDOT

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

PLATE NUMBER
630.21

Sheet 1 of 1



GENERAL NOTES:

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

September 20, 2000

Published Date: 3rd Qtr. 2009

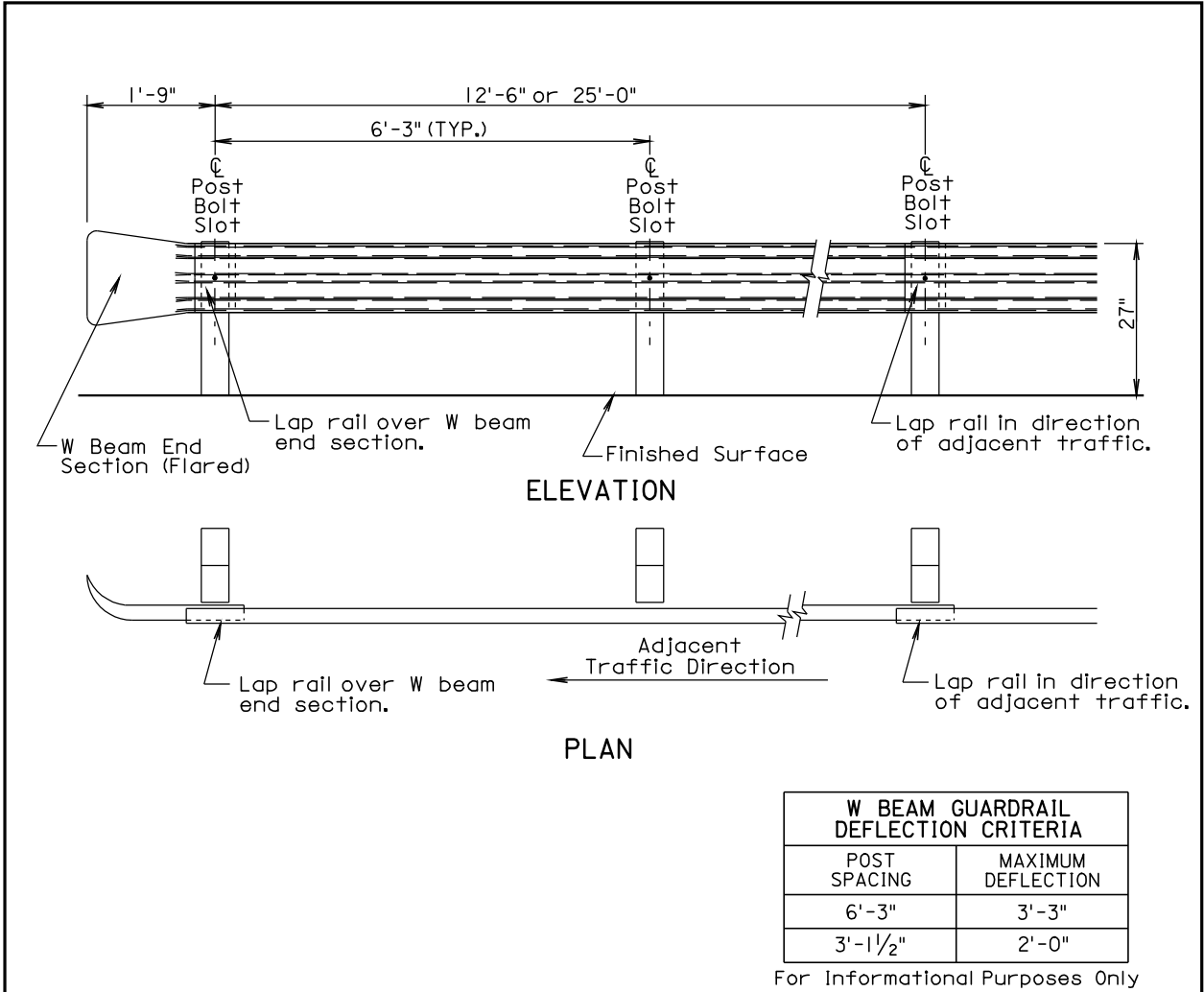
SDOT

W BEAM GUARDRAIL POST INSTALLATION

PLATE NUMBER
630.31

Sheet 1 of 1

Plotting Date: 05-OCT-2009



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.

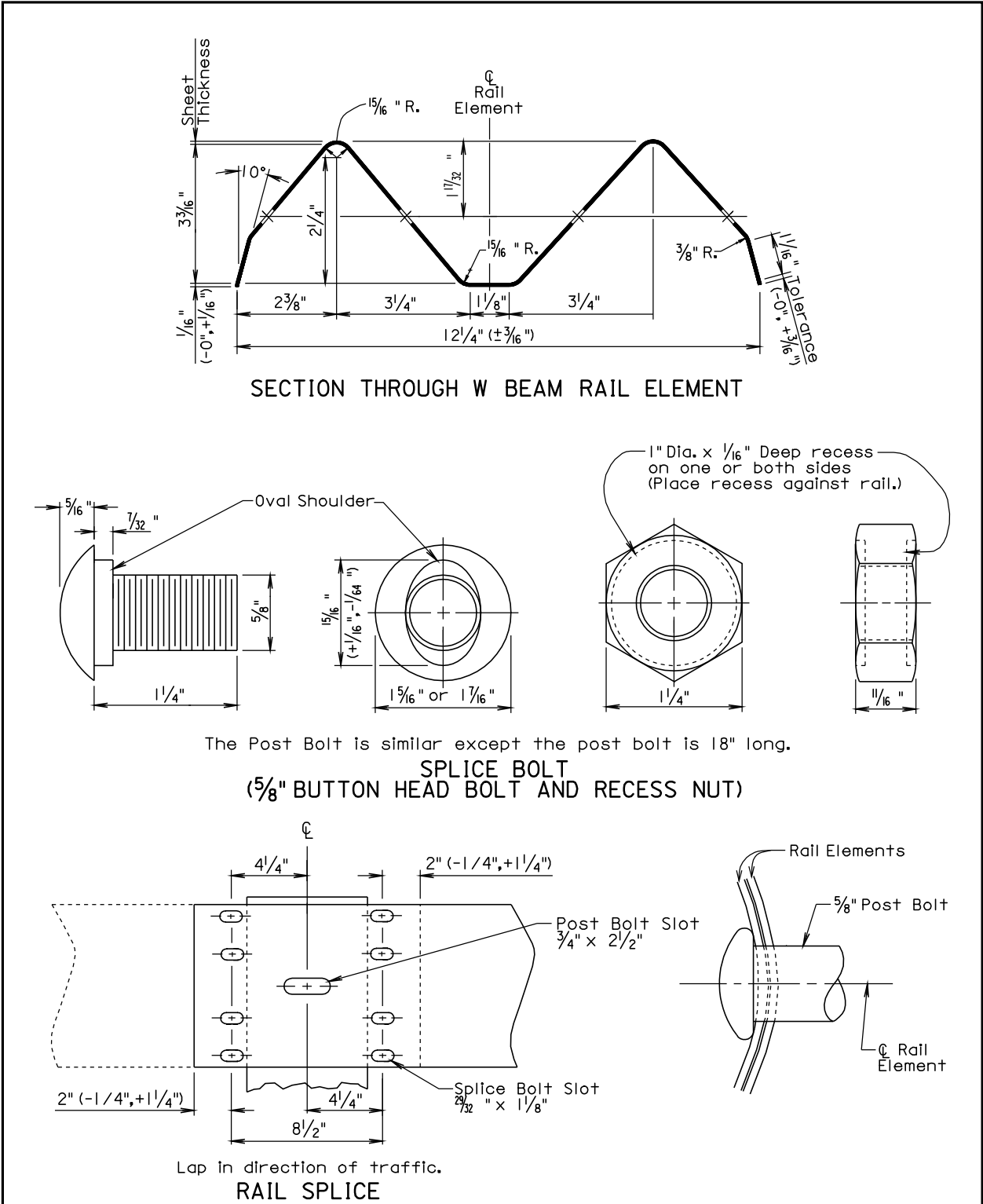
W beam rail section lengths may be 12'-6" and/or 25'-0". The combination of section lengths used shall be compatible with the total length of rail per site as shown in the plans.

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.

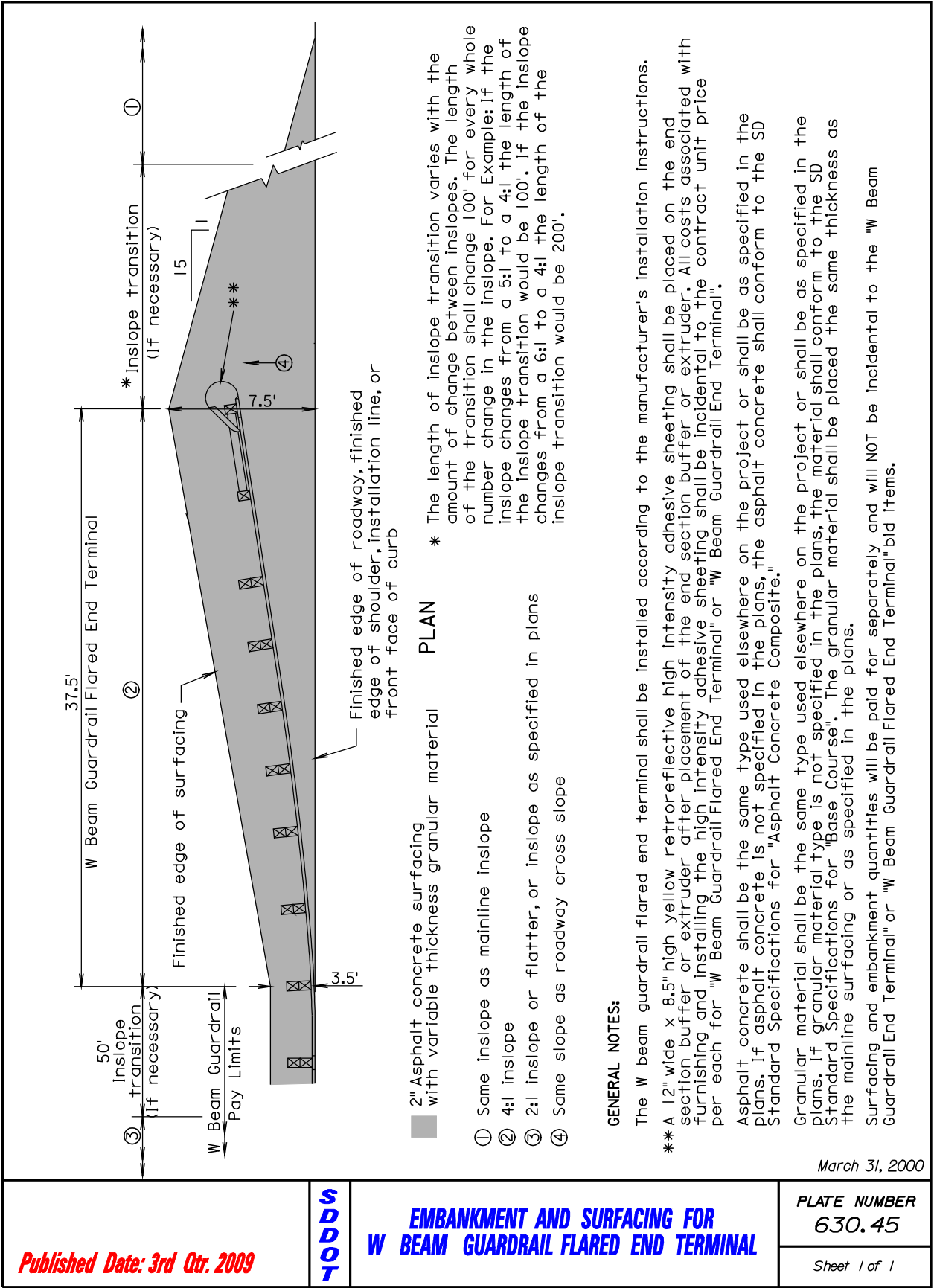
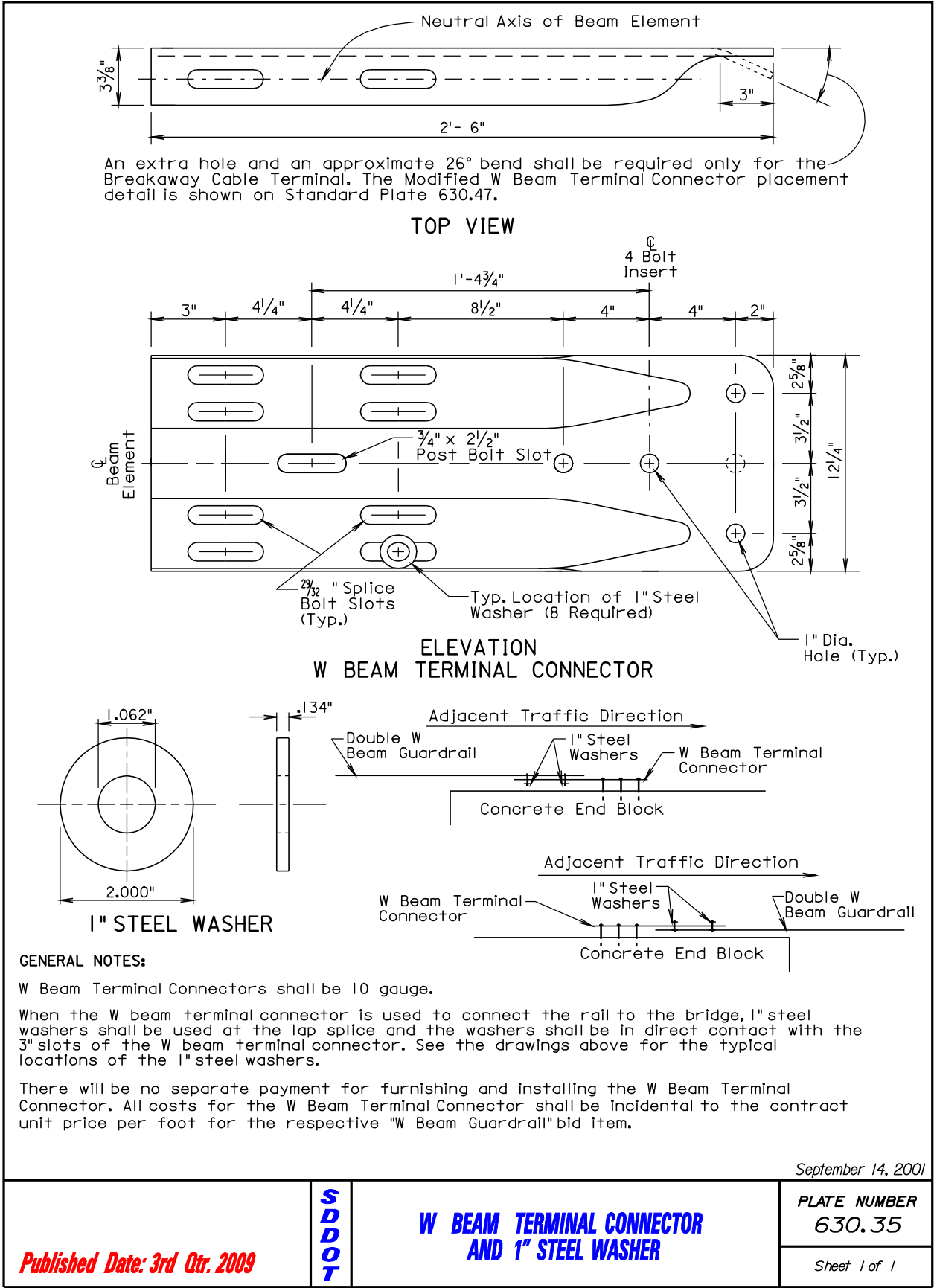
Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail" bid item.

March 28, 2001



December 23, 2004

Plotting Date: 05-OCT-2009



Published Date: 3rd Qtr. 2009

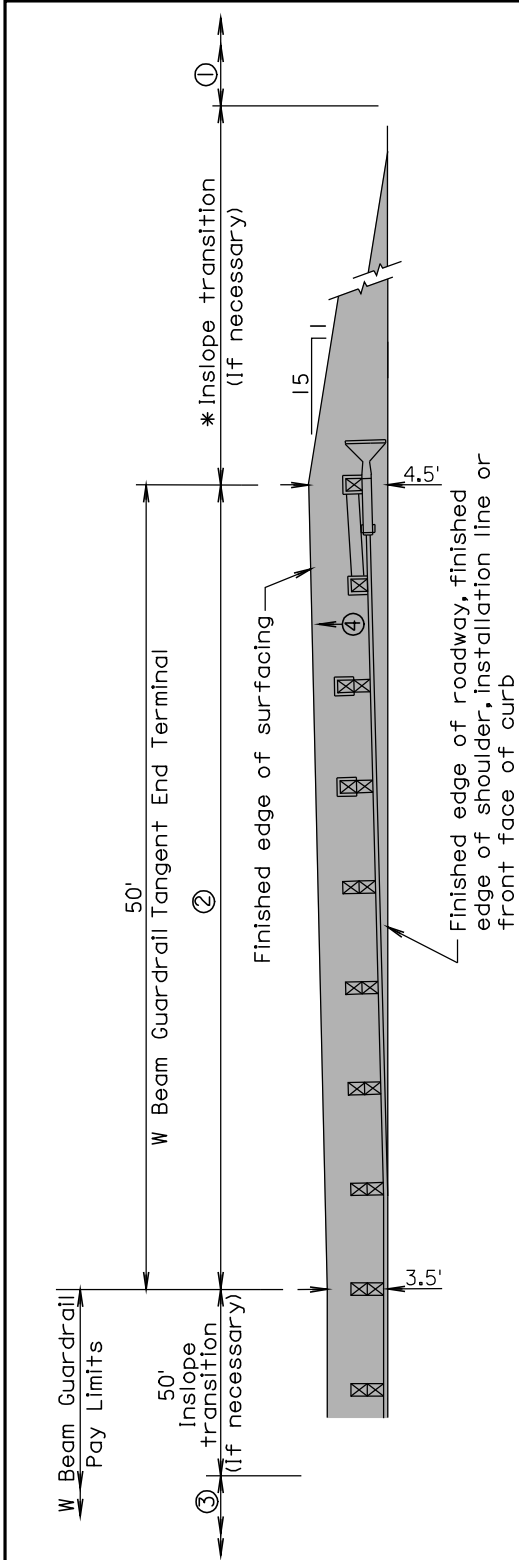
SDOT

EMBANKMENT AND SURFACING FOR
W BEAM GUARDRAIL TANGENT END TERMINAL

PLATE NUMBER
630.46

Sheet 1 of 1

March 28, 2001



PLAN

2" Asphalt concrete surfacing with variable thickness granular material

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

- ① Same inslope as mainline inslope
- ② 4:1 inslope
- ③ 2:1 inslope or flatter, or inslope as specified in plans
- ④ Same slope as roadway cross slope

GENERAL NOTES:

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

Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail End Terminal" or "W Beam Guardrail Tangent End Terminal" bid items.

Published Date: 3rd Qtr. 2009

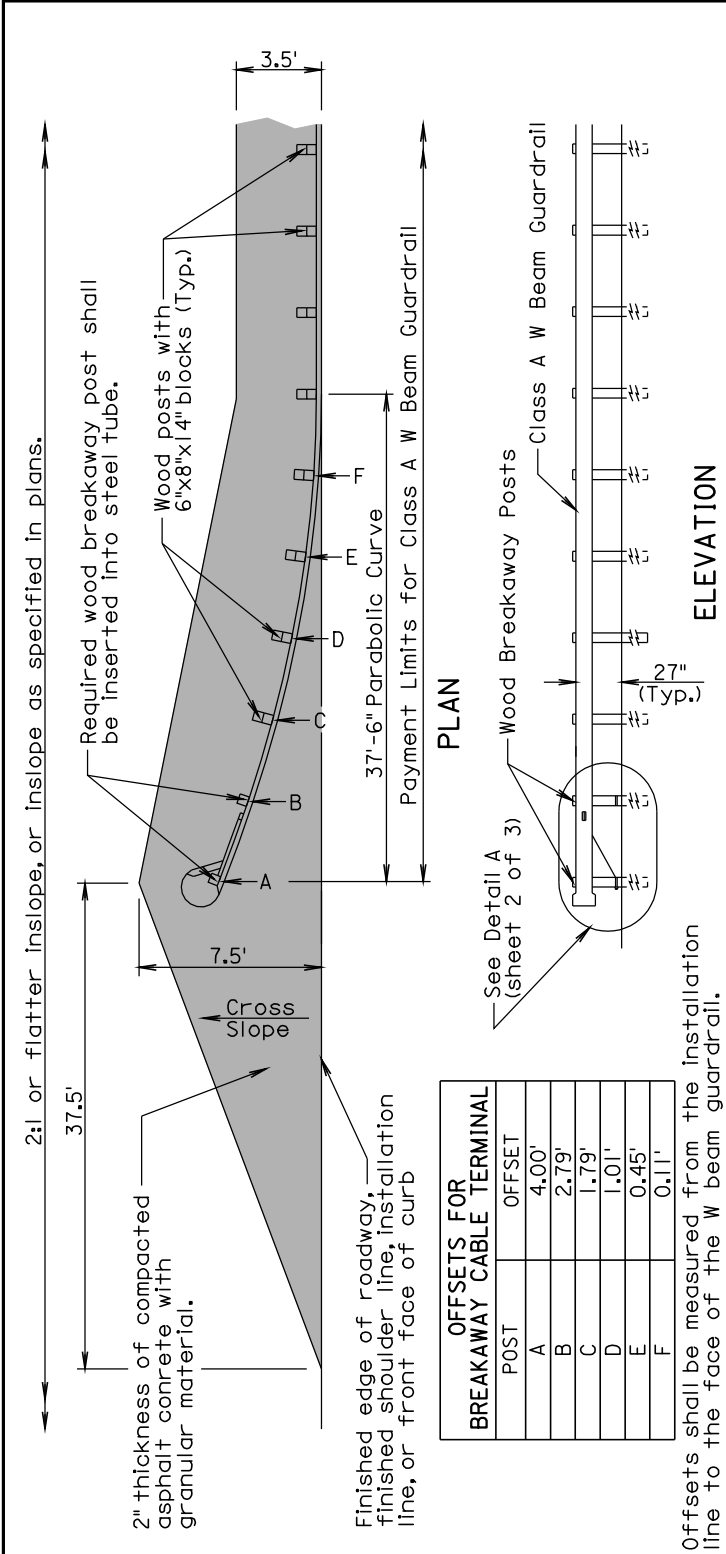
SDOT

W BEAM GUARDRAIL
BREAKAWAY CABLE TERMINAL

PLATE NUMBER
630.47

Sheet 1 of 3

December 23, 2006

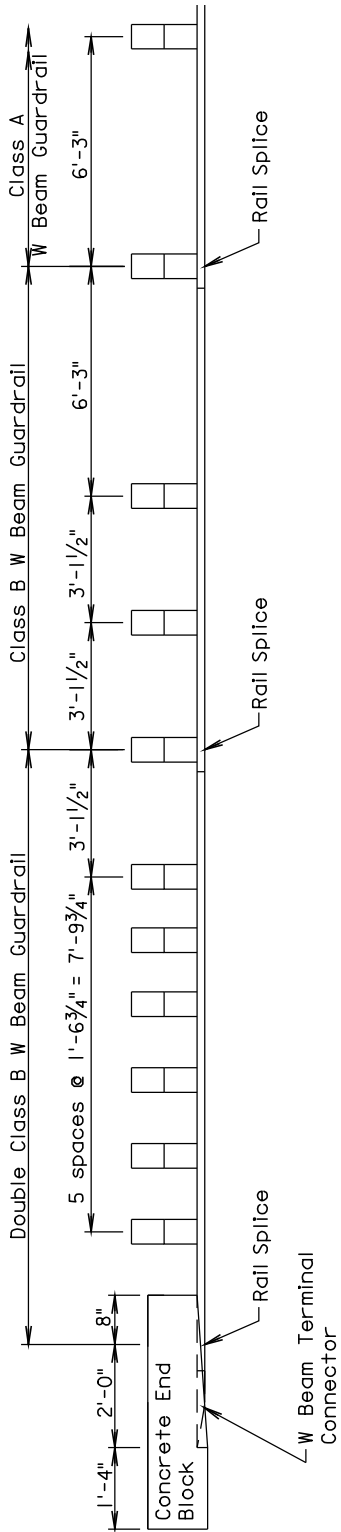


OFFSETS FOR BREAKAWAY CABLE TERMINAL	
POST	OFFSET
A	4.00'
B	2.79'
C	1.79'
D	1.01'
E	0.45'
F	0.11'

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. Surfacing and embankment quantities will be paid for separately and will NOT be incidental to the "W Beam Guardrail Breakaway Cable Terminal" or "Class A W Beam Guardrail with Wood Posts" bid items. Asphalt concrete shall be the same type used elsewhere on the project or shall be as specified in the plans. If asphalt concrete is not specified in the plans, the asphalt concrete shall conform to the 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. Costs for constructing the W Beam Guardrail Breakaway Cable Terminal including labor, equipment, and materials including the anchor bracket, cable assembly, steel tubes, soil plates, bearing plate, pipe sleeve, W beam end section (buffer), modified W beam terminal connector, and all necessary hardware shall be incidental to the contract unit price per each for "W Beam Guardrail Breakaway Cable Terminal".

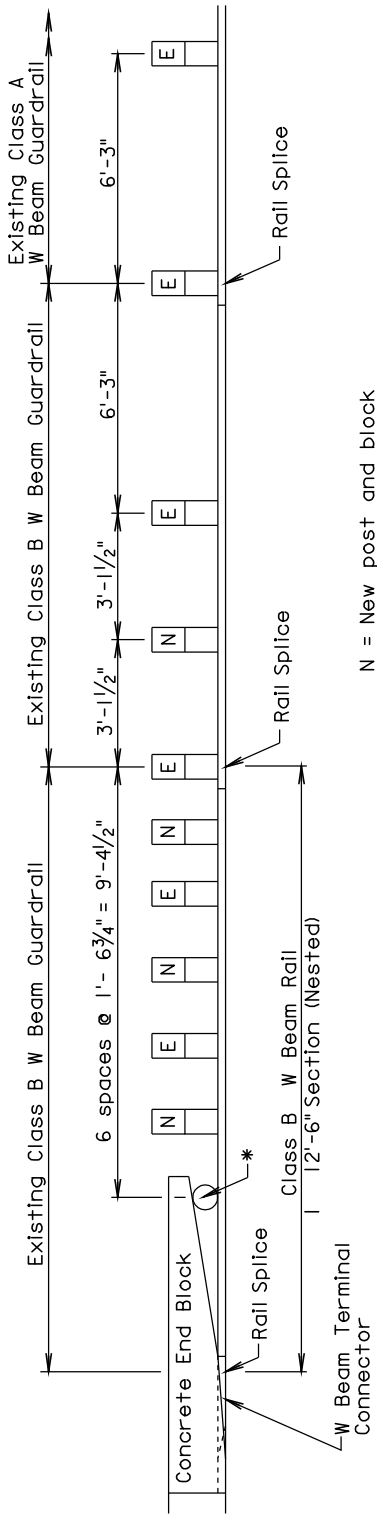
Plotting Date: 05-OCT-2009



POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END

March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END	PLATE NUMBER
			630.50
			Sheet 1 of 1



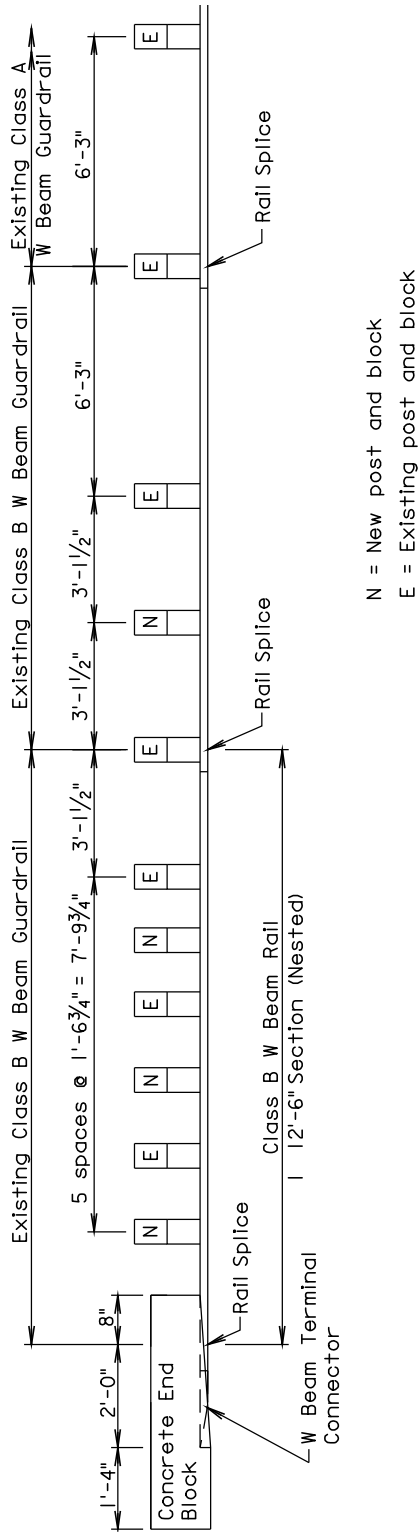
N = New post and block
E = Existing post and block

- * Remove and discard the in place tapered block and 5/8" threaded bolt. Install at the same location a 6" I.D. x 9" long schedule 40 galvanized pipe. Fasten to nested rails with 2" button head bolt with nut, rectangular plate washer, and 5/8" bolt washer.
- * All costs incurred to remove the block and furnish and install the pipe shall be incidental to the contract unit price per foot for "Straight Class B W Beam Rail".

POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END
(W BEAM RETROFIT)

March 31, 2000

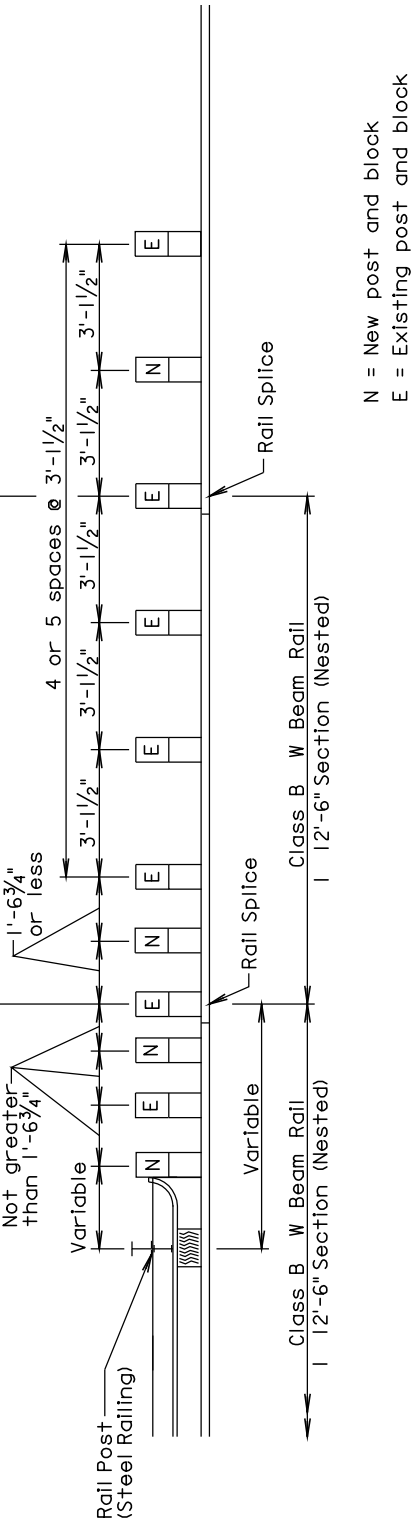
Published Date: 3rd Qtr. 2009	S D D O T	POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END (W BEAM RETROFIT)	PLATE NUMBER
			630.55
			Sheet 1 of 1



N = New post and block
E = Existing post and block

POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END
(W BEAM RETROFIT)

March 31, 2000

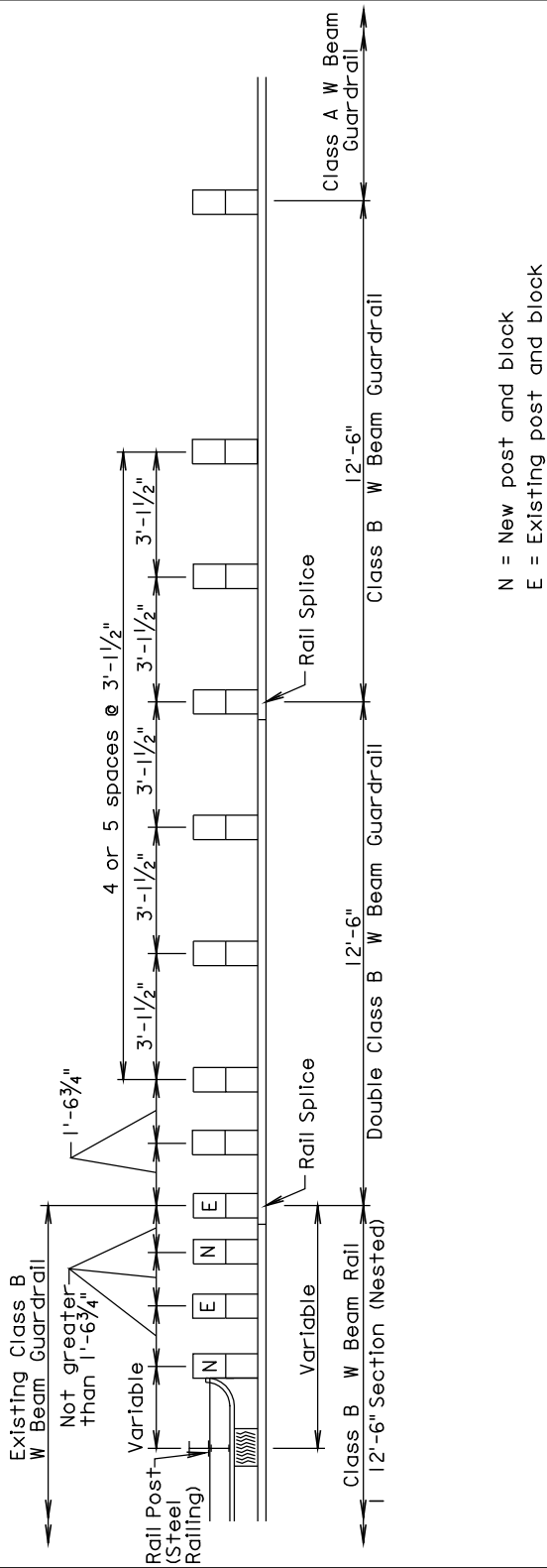


N = New post and block
E = Existing post and block

POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END
(W BEAM RETROFIT)

March 31, 2000

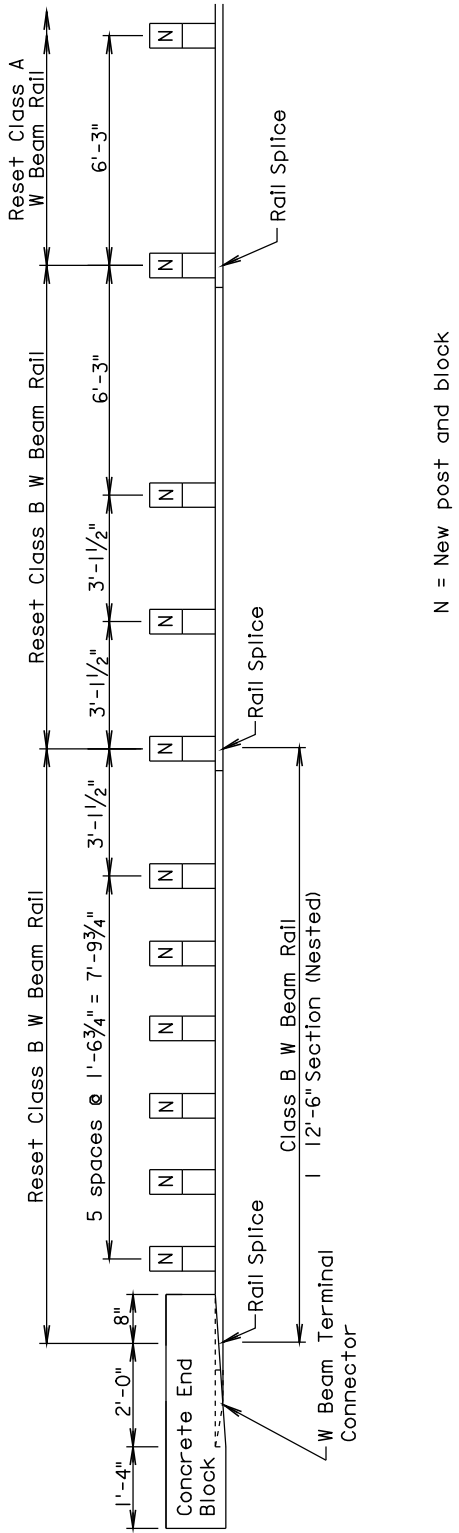
Plotting Date: 05-OCT-2009



POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END
(W BEAM REALIGNMENT)

March 31, 2000

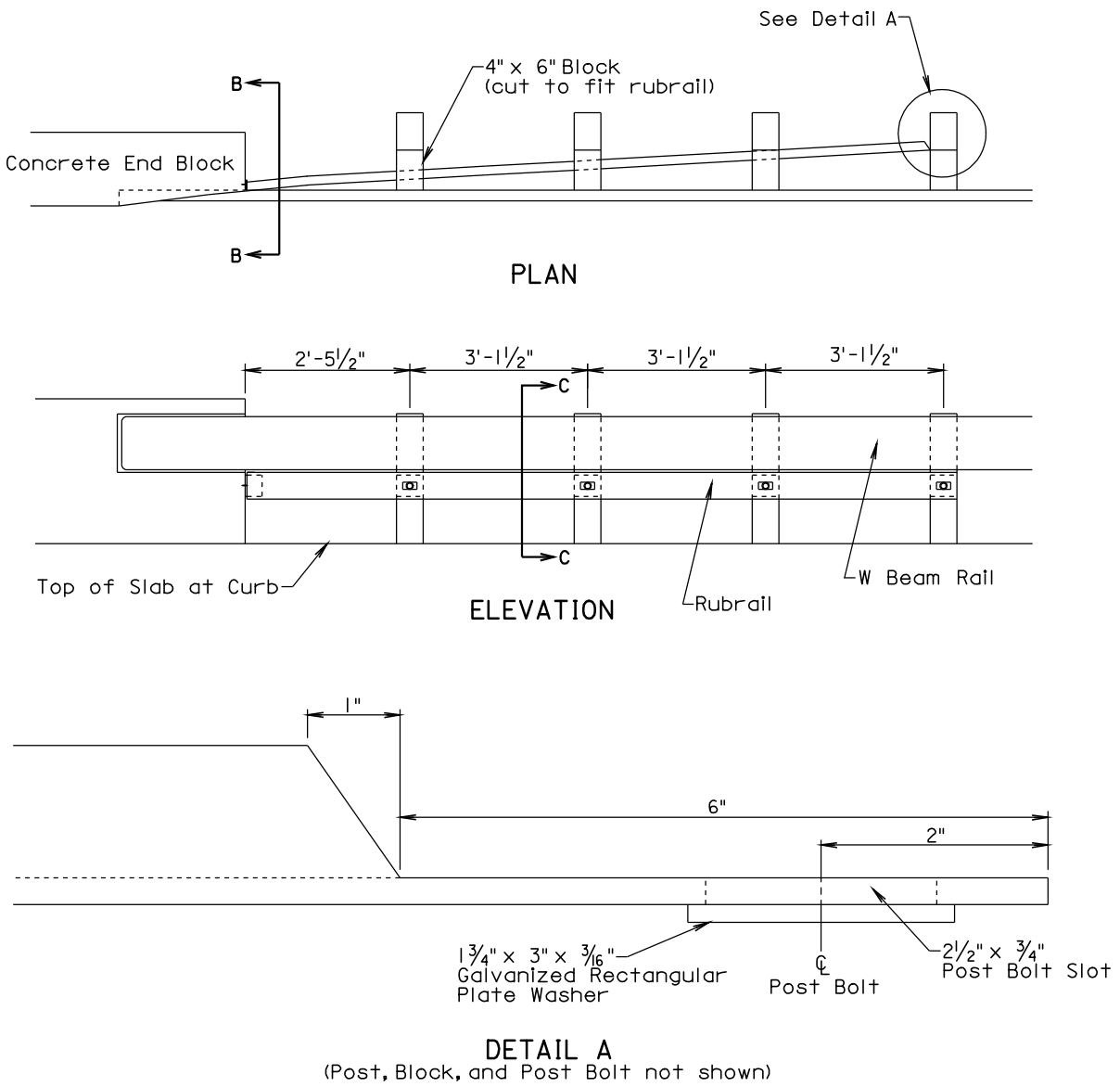
Published Date: 3rd Qtr. 2009	S D D O T	POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END (W BEAM REALIGNMENT)	PLATE NUMBER
			630.58
			Sheet 1 of 1



POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END
(W BEAM RESET AND RETROFIT)

March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	POST SPACING ARRANGEMENT FOR W BEAM GUARDRAIL AT BRIDGE END (W BEAM RESET AND RETROFIT)	PLATE NUMBER
			630.59
			Sheet 1 of 1



GENERAL NOTES:

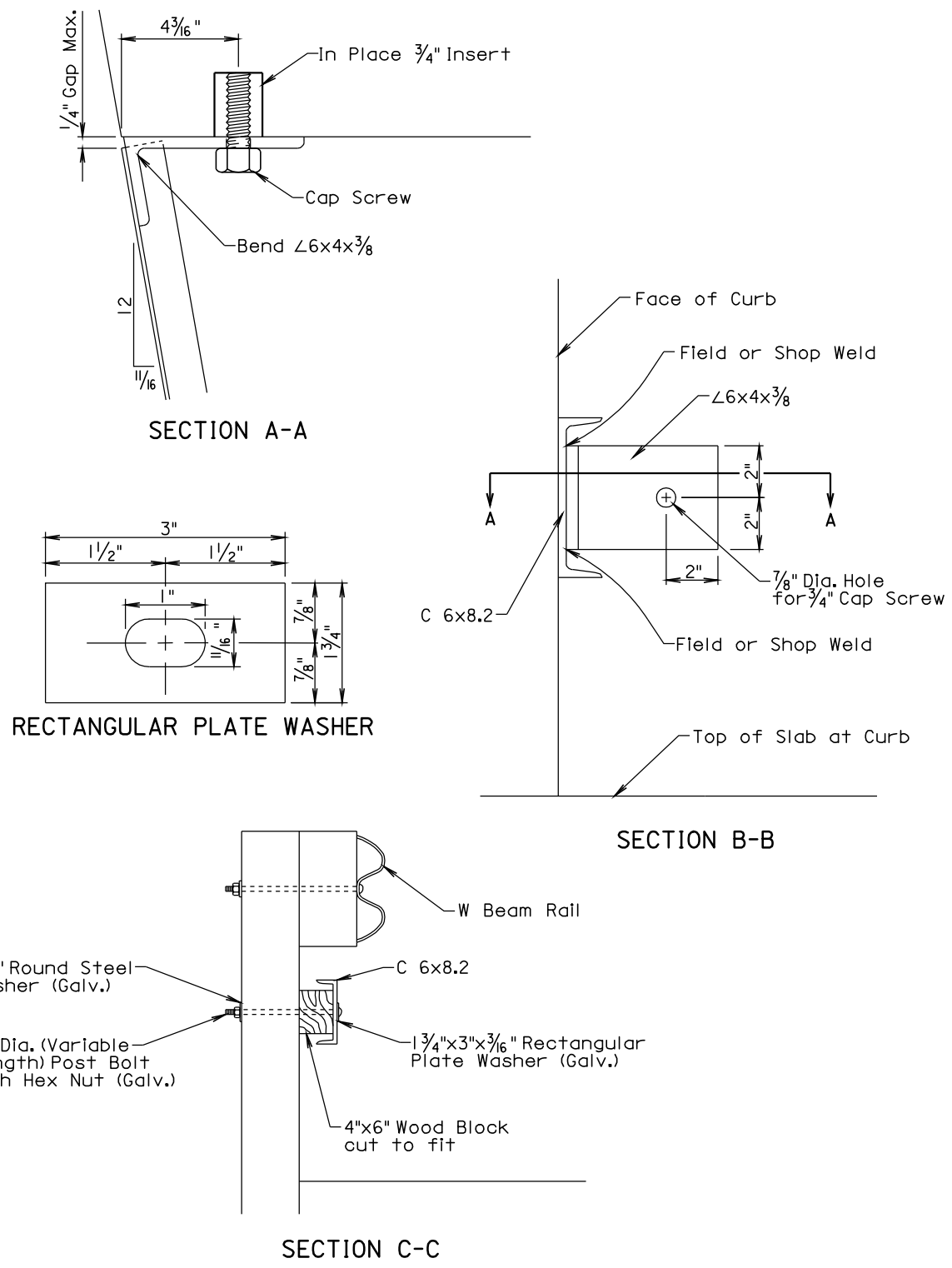
The steel shall be in conformance with ASTM A 36 and shall be galvanized after fabrication in conformance with ASTM A 123. If pre-galvanized steel members are used, all cuts and welds shall be coated with an approved galvanizing paint.

Offset blocks shall be in conformance with section 630 of the Standard Specifications.

All hardware shall be in conformance with the requirements of AASHTO M 180.

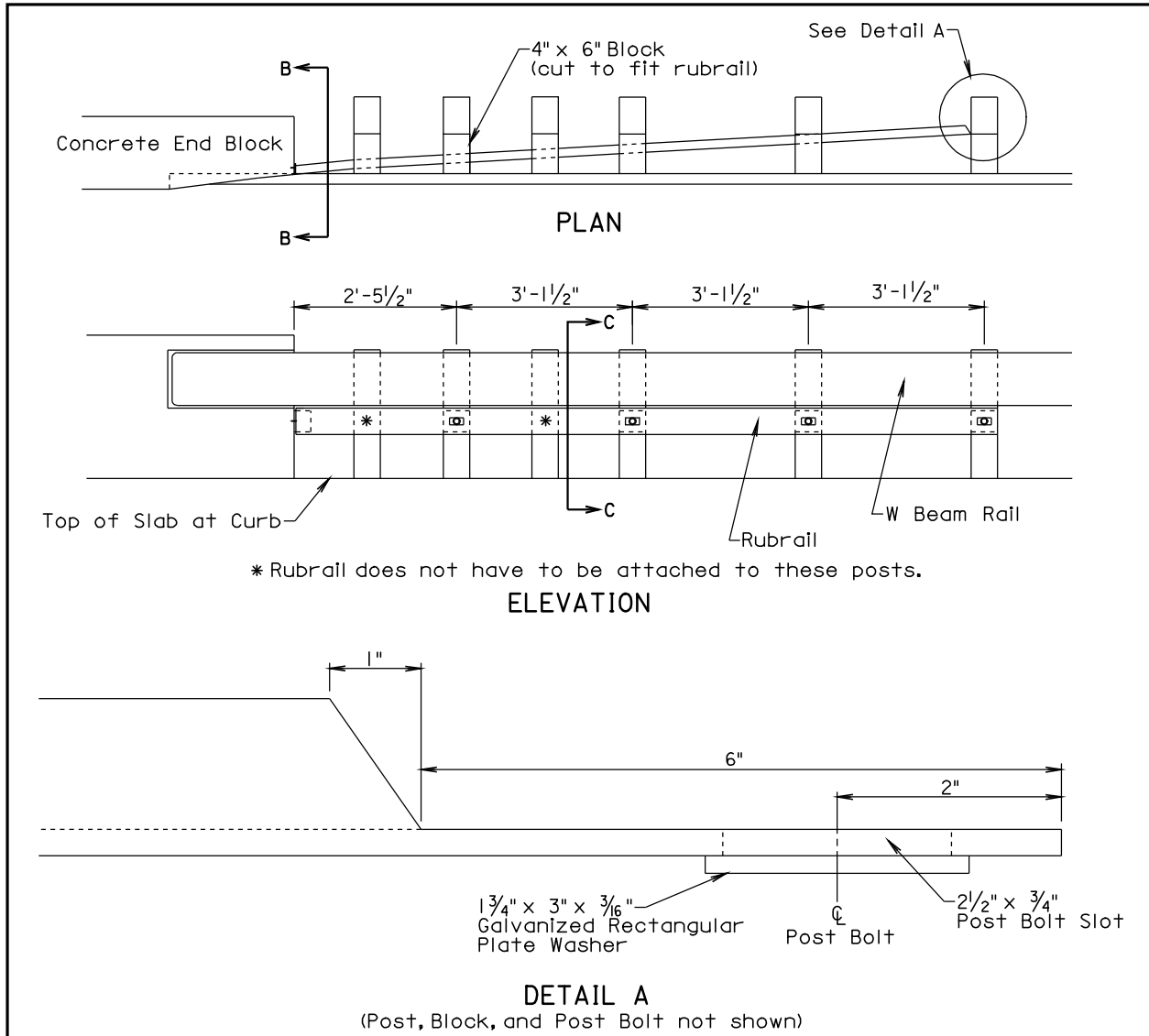
March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	RUBRAIL AT BRIDGE END (CAST IN INSERT)	PLATE NUMBER 630.75
			Sheet 1 of 2



March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	RUBRAIL AT BRIDGE END (CAST IN INSERT)	PLATE NUMBER 630.75
			Sheet 2 of 2



GENERAL NOTES:

The steel shall be in conformance with ASTM A 36 and shall be galvanized after fabrication in conformance with ASTM A 123. If pre-galvanized steel members are used, all cuts and welds shall be coated with an approved galvanizing paint.

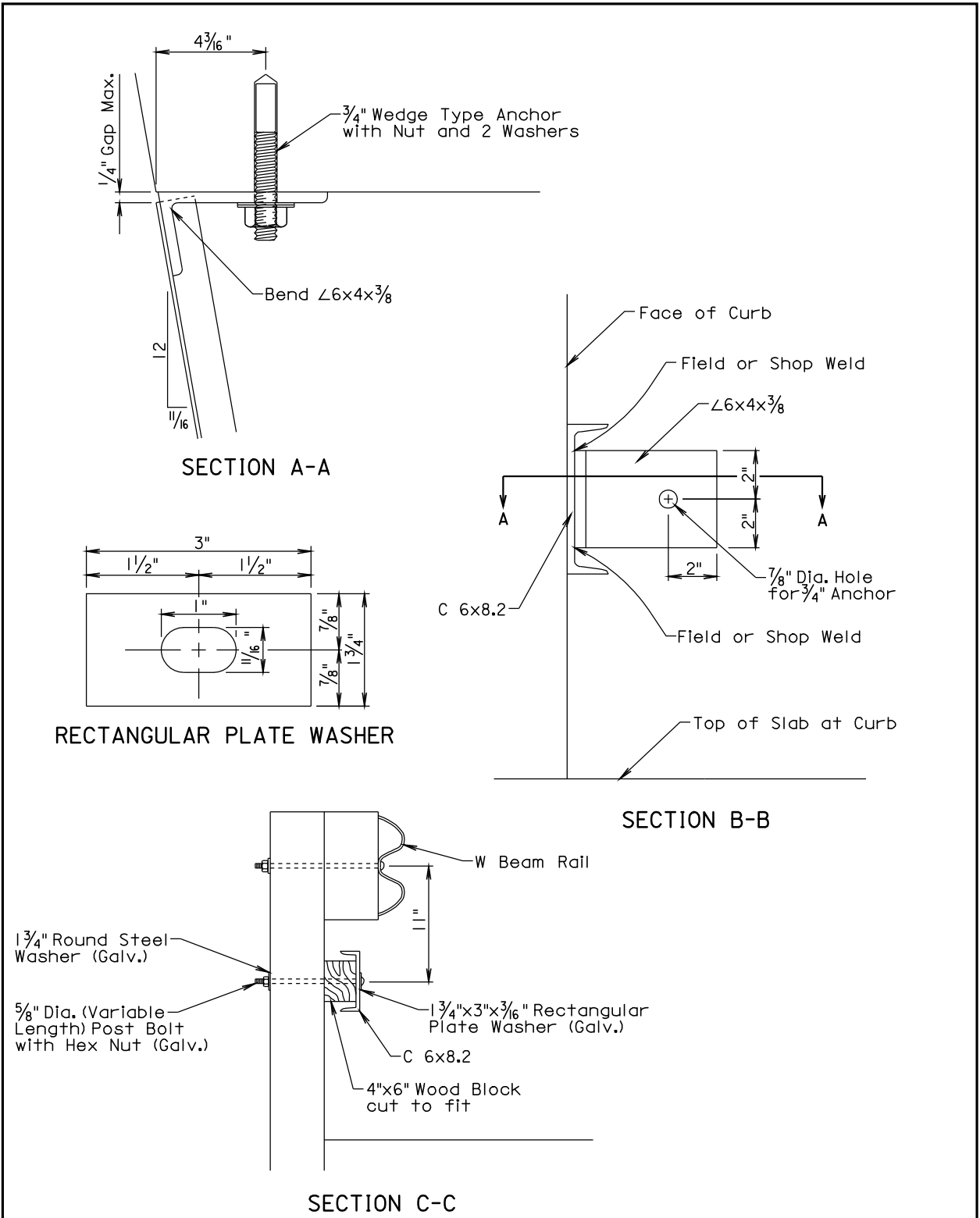
Offset blocks shall be in conformance with section 630 of the Standard Specifications.

All hardware shall be in conformance with the requirements of AASHTO M 180.

The wedge type anchor bolt, nut, and washer shall be hot dipped galvanized or made of a corrosion resistant material. The wedge type anchor shall be capable of sustaining an ultimate load in tension or shear of 17,000 pounds when the anchor is set in 4,500 psi compressive strength concrete. The anchor shall be installed according to the manufacturer's recommendations. The Contractor shall obtain certification from the manufacturer that the anchor meets the tensile and shear requirements and shall submit the certification to the Engineer. The cost for furnishing and installing the wedge type anchor, nut, and washer shall be incidental to the contract unit price per foot for "Rubrail".

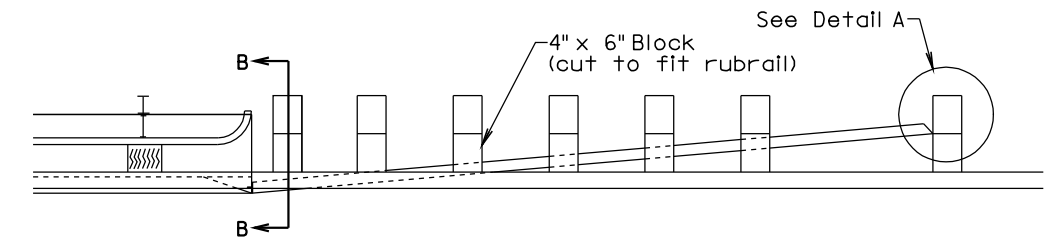
March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	RUBRAIL AT BRIDGE END (W BEAM RETROFIT AND DRILLED IN ANCHOR)	PLATE NUMBER 630.76
			Sheet 1 of 2

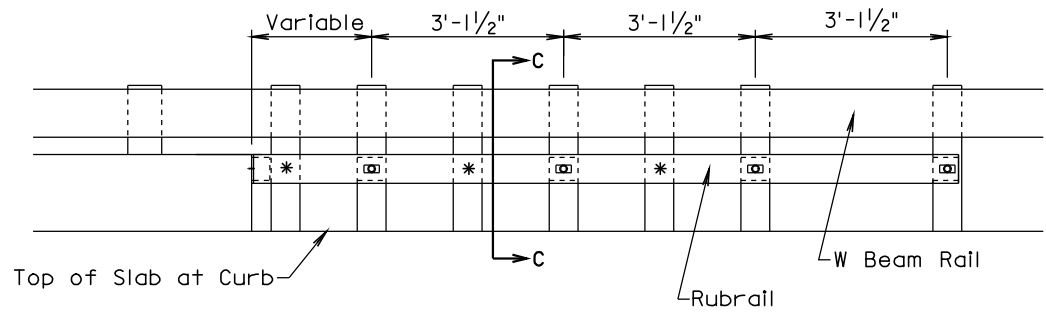


March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	RUBRAIL AT BRIDGE END (W BEAM RETROFIT AND DRILLED IN ANCHOR)	PLATE NUMBER 630.76
			Sheet 2 of 2

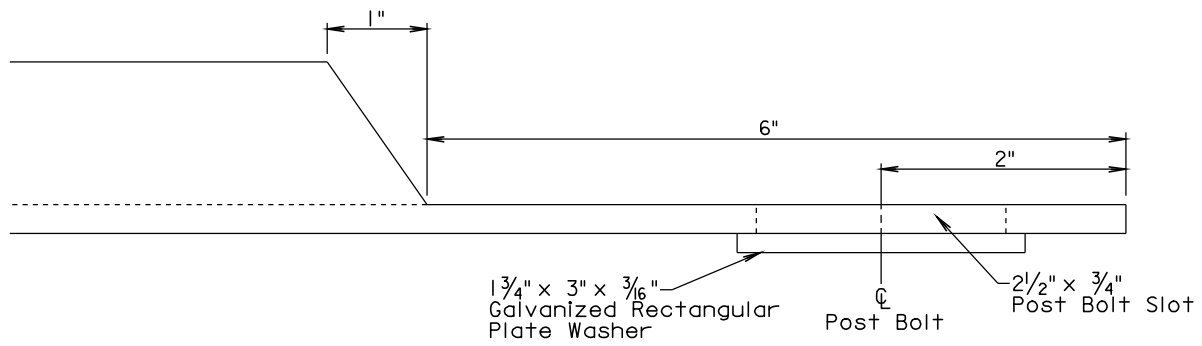


PLAN



*Rubrail does not have to be attached to these posts.

ELEVATION



DETAIL A

(Post, Block, and Post Bolt not shown)

GENERAL NOTES:

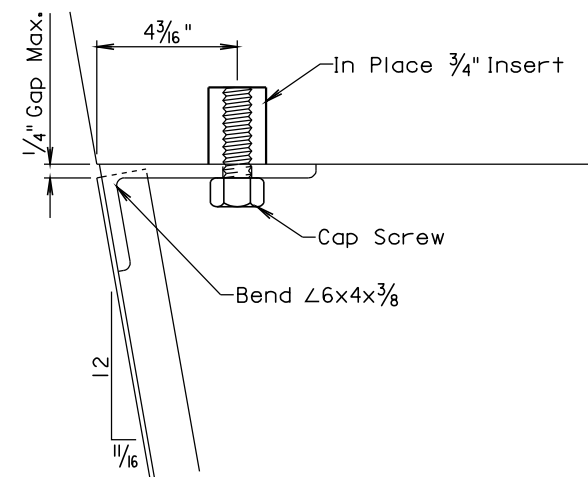
The steel shall be in conformance with ASTM A 36 and shall be galvanized after fabrication in conformance with ASTM A 123. If pre-galvanized steel members are used, all cuts and welds shall be coated with an approved galvanizing paint.

Offset blocks shall be in conformance with section 630 of the Standard Specifications.

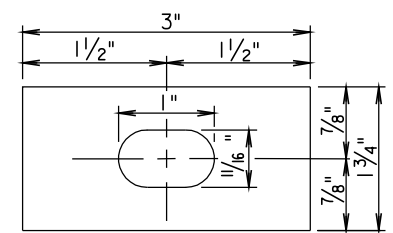
All hardware shall be in conformance with the requirements of AASHTO M 180.

March 31, 2000

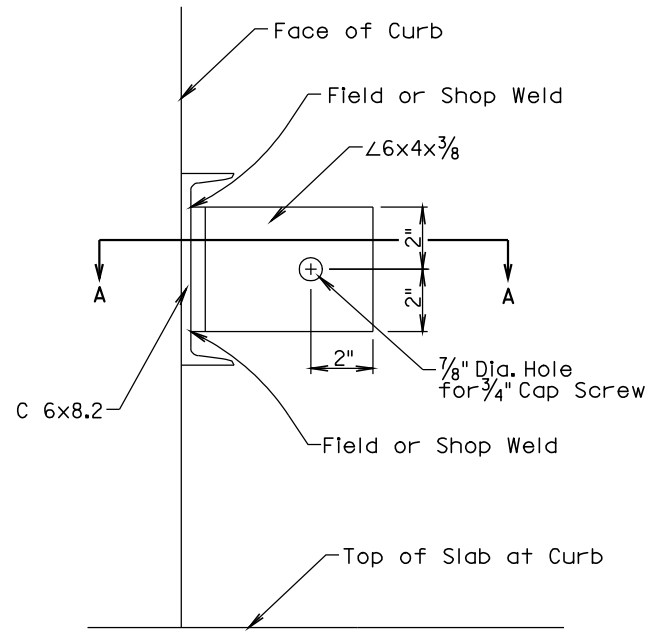
Published Date: 3rd Qtr. 2009	S D D O T	RUBRAIL AT BRIDGE END (W BEAM RETROFIT AND CAST IN INSERT)	PLATE NUMBER 630.77
			Sheet 1 of 2



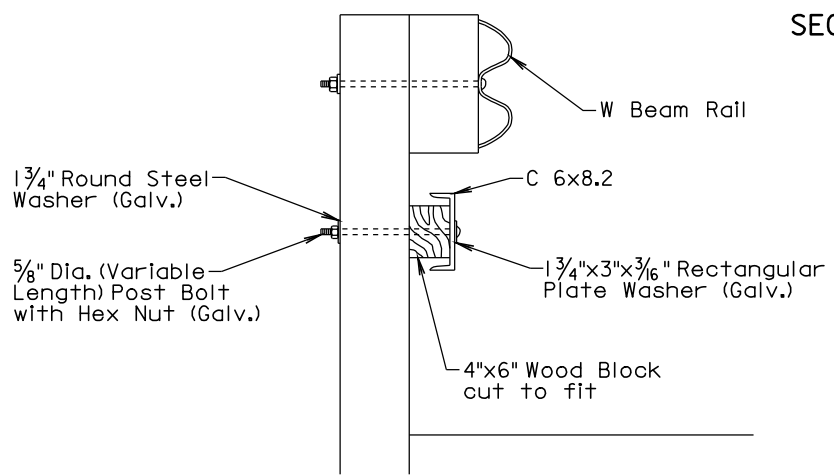
SECTION A-A



RECTANGULAR PLATE WASHER



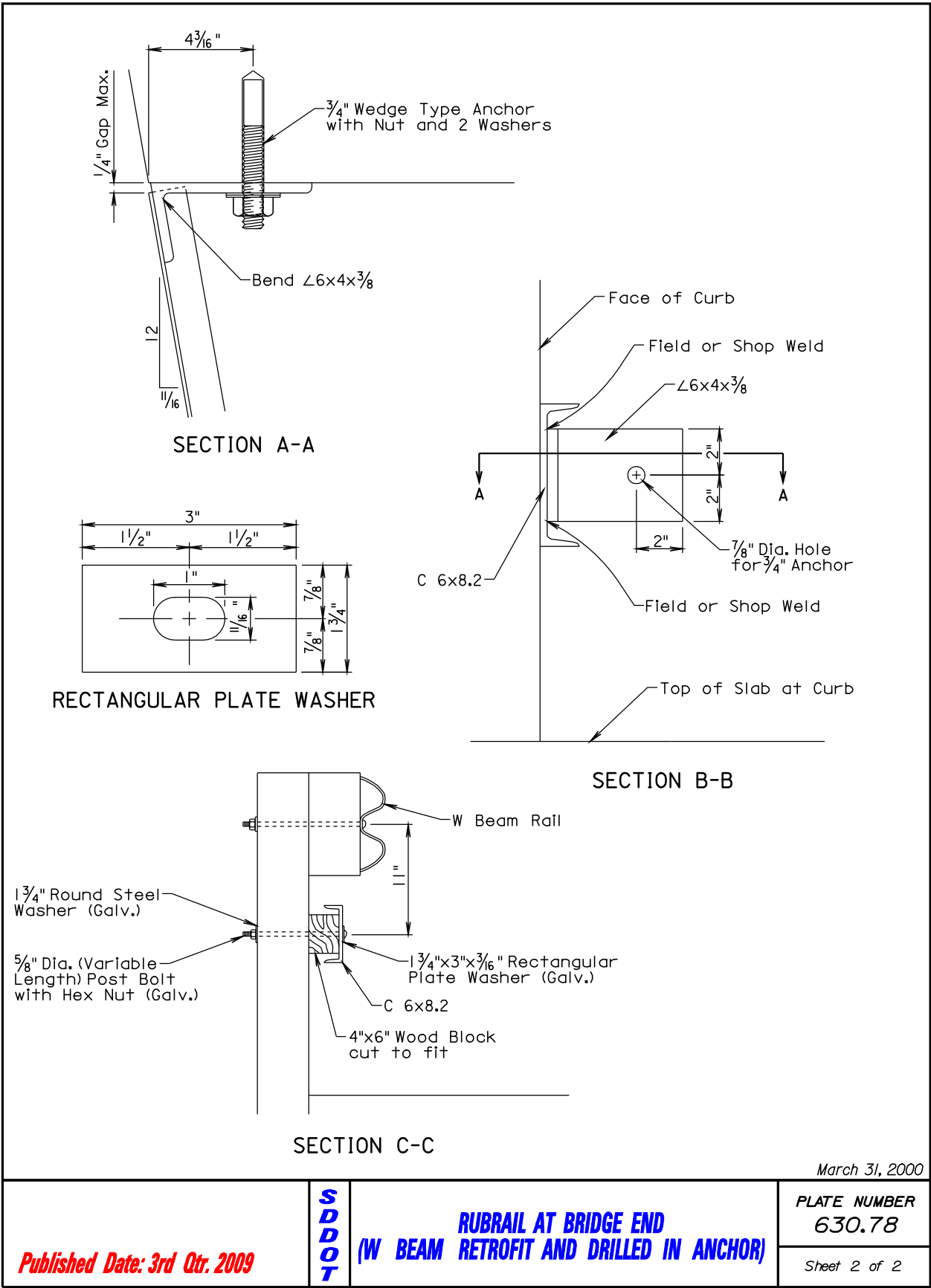
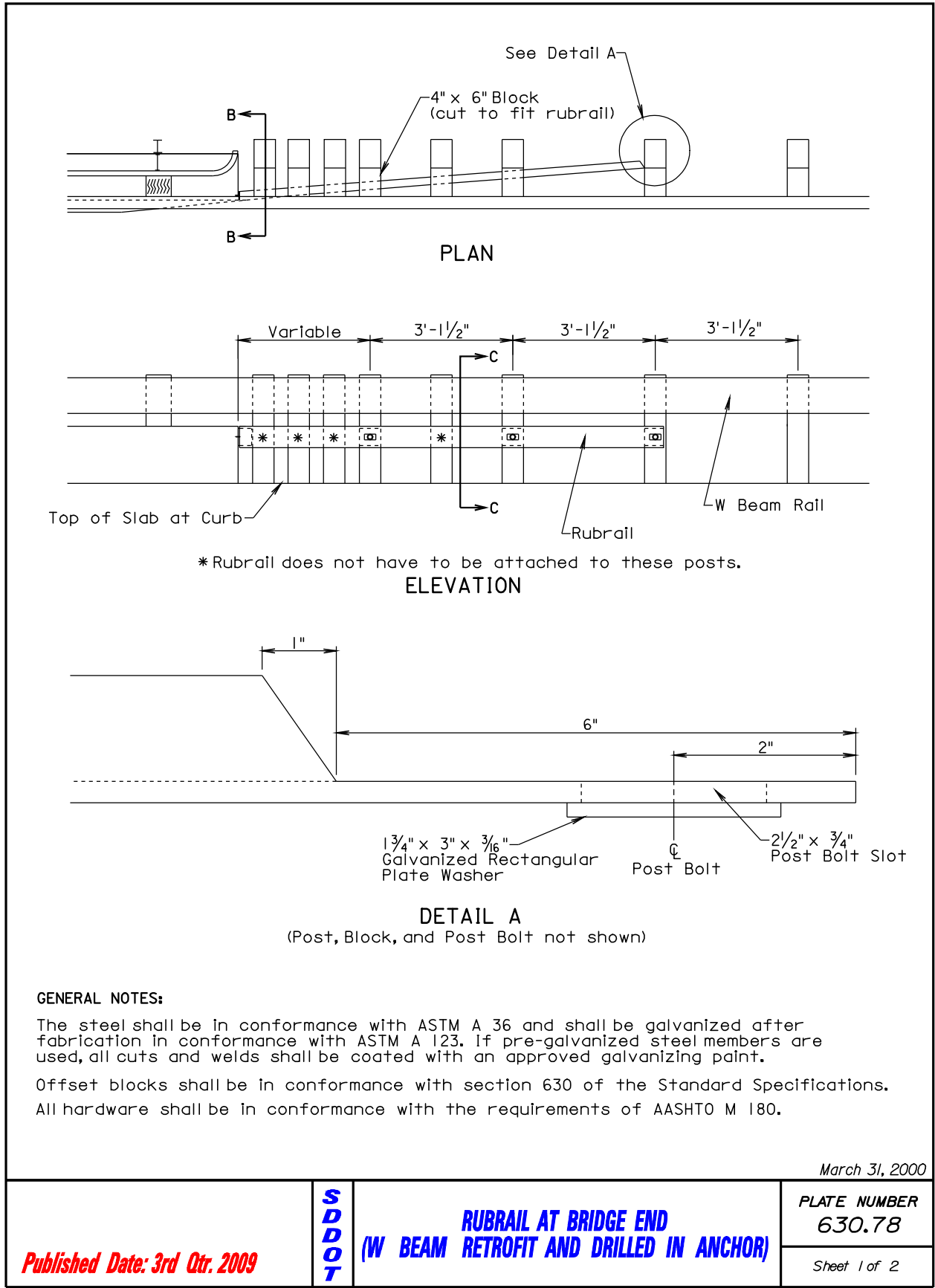
SECTION B-B

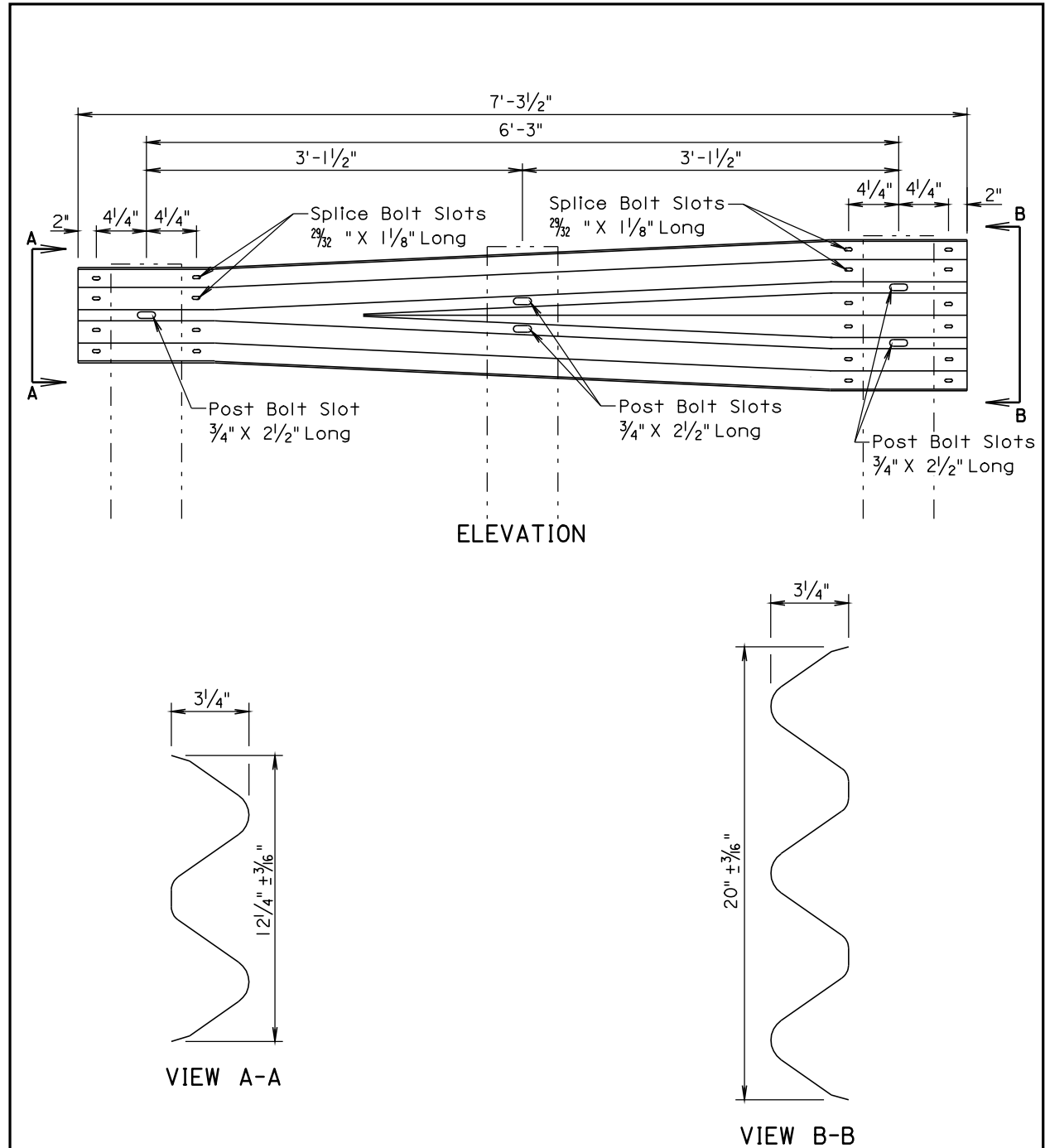


SECTION C-C

March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	RUBRAIL AT BRIDGE END (W BEAM RETROFIT AND CAST IN INSERT)	PLATE NUMBER 630.77
			Sheet 2 of 2



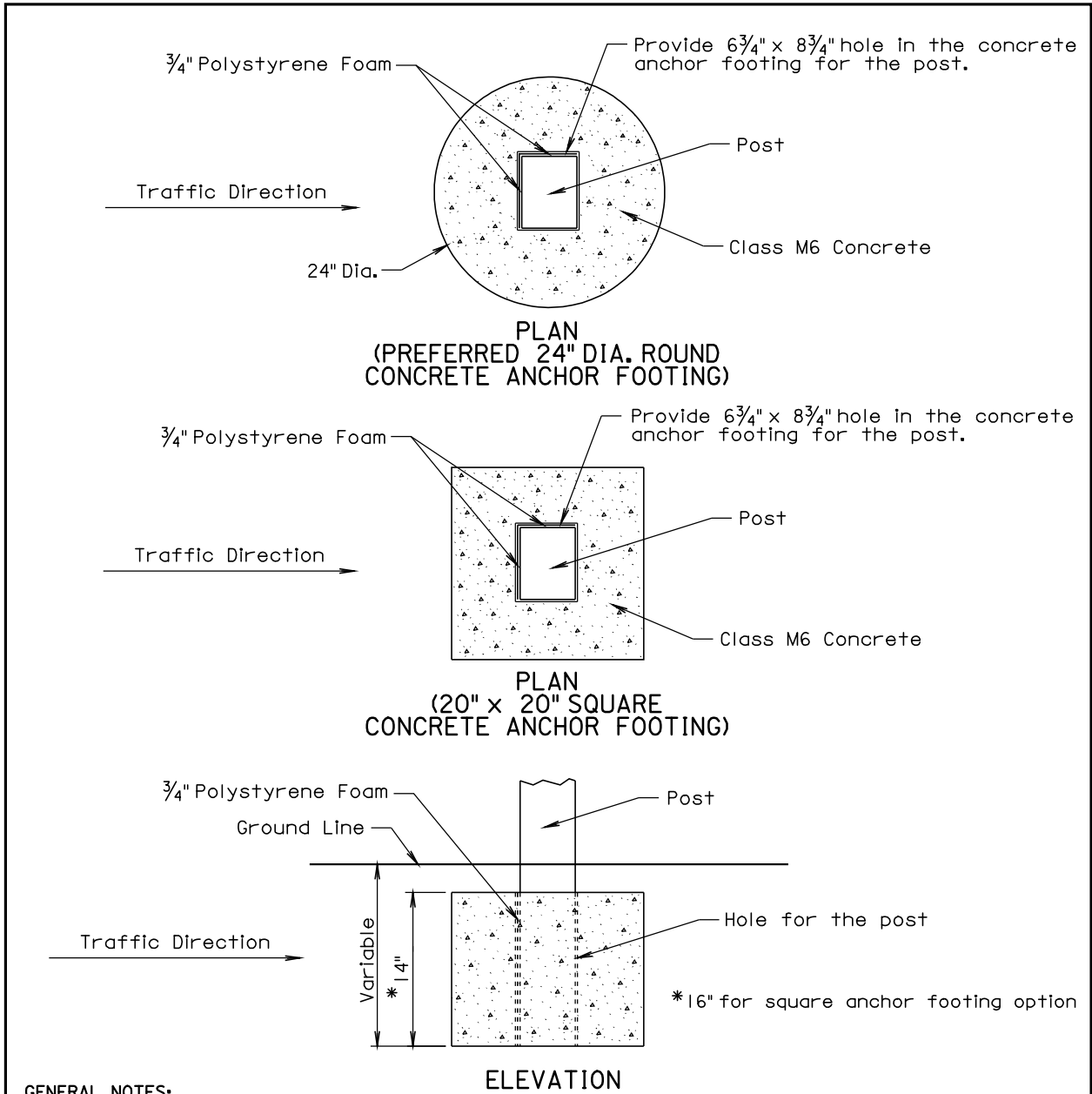


GENERAL NOTE:

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

March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	W BEAM TO THRIE BEAM GUARDRAIL TRANSITION SECTION	PLATE NUMBER 630.82
			Sheet 1 of 1



GENERAL NOTES:

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

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

Forms for the concrete anchor footing hole is not required.

Concrete for the concrete anchor footing shall be Class M6.

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

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

March 31, 2000

Published Date: 3rd Qtr. 2009	S D D O T	CONCRETE ANCHOR FOOTING FOR SHORT GUARDRAIL POST	PLATE NUMBER 630.84
			Sheet 1 of 1