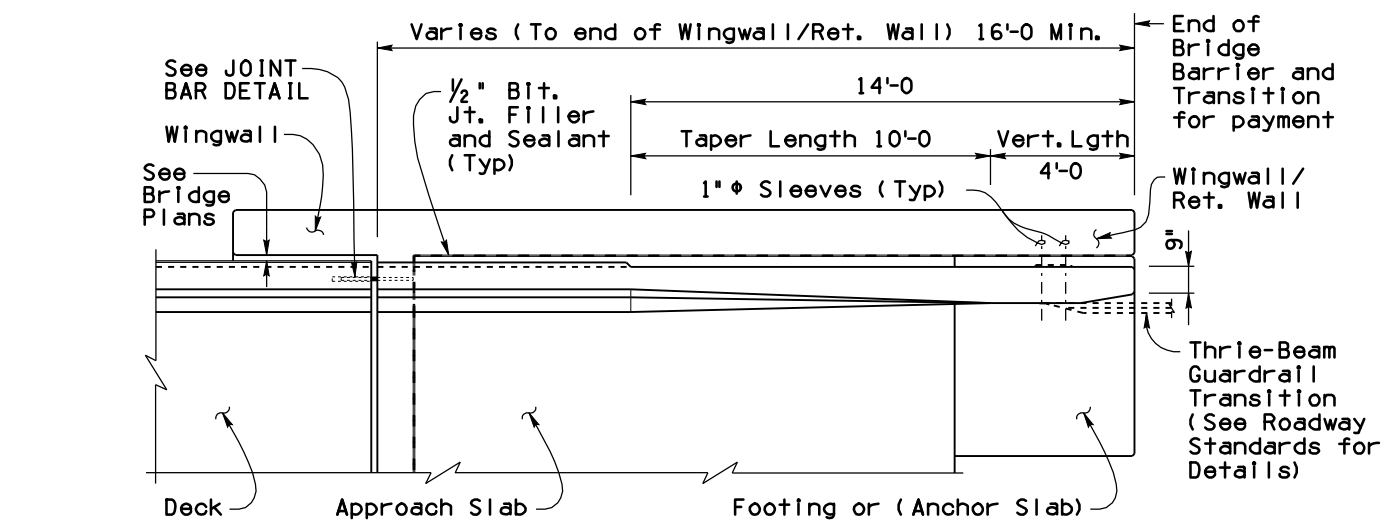


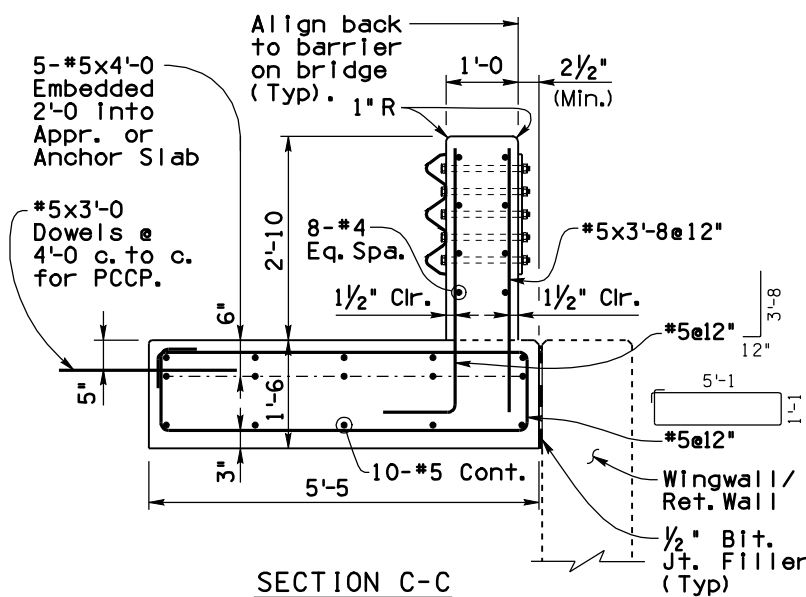
Note to Designer:  
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06/12

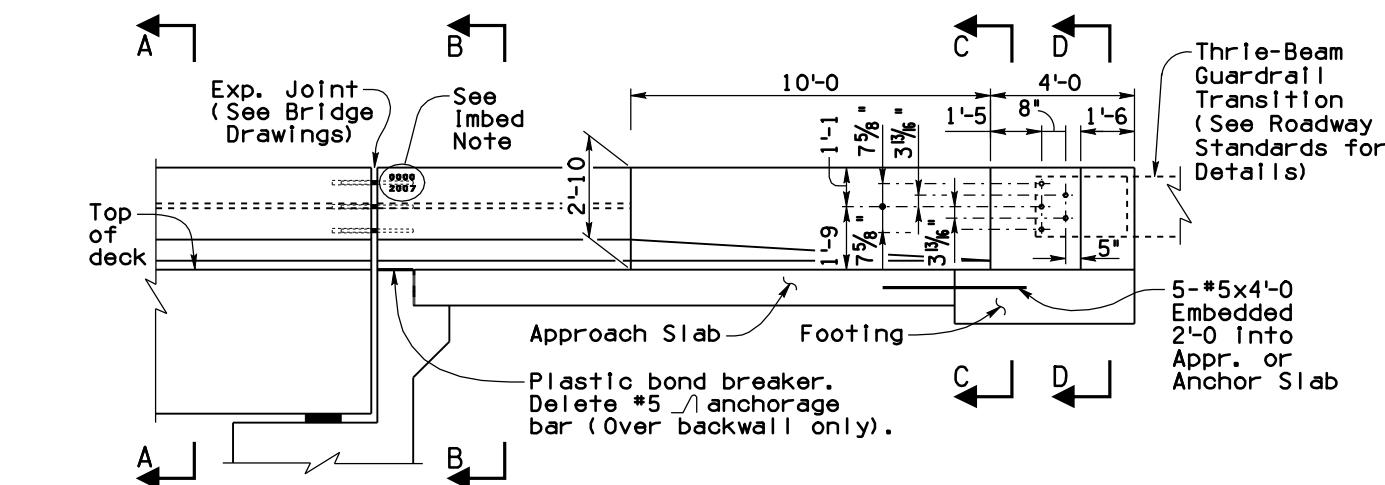
PRIOR DISTRIBUTION DATE



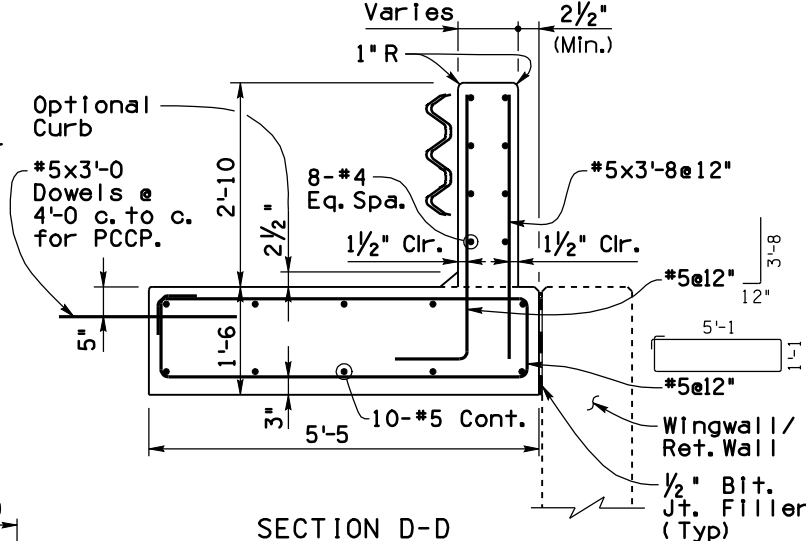
PLAN



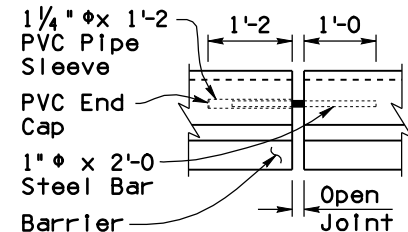
SECTION C-C



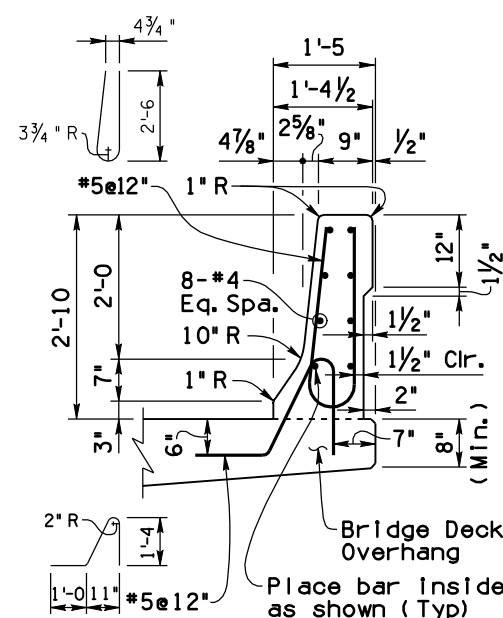
ELEVATION



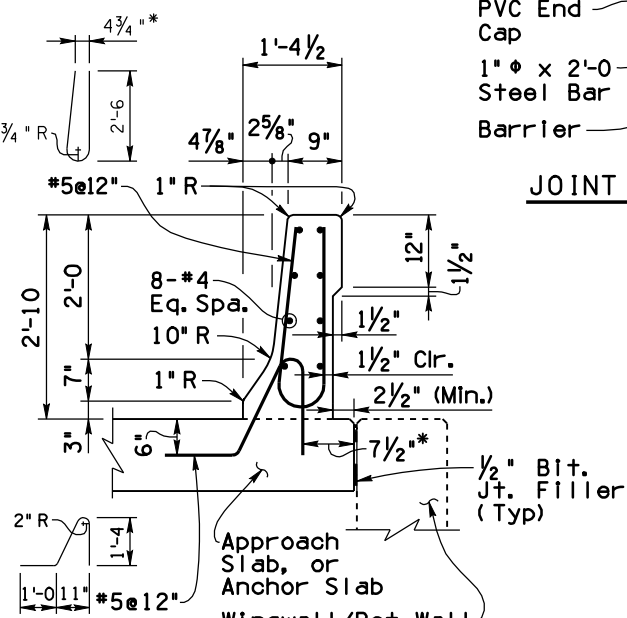
SECTION D-D



JOINT BAR DETAIL

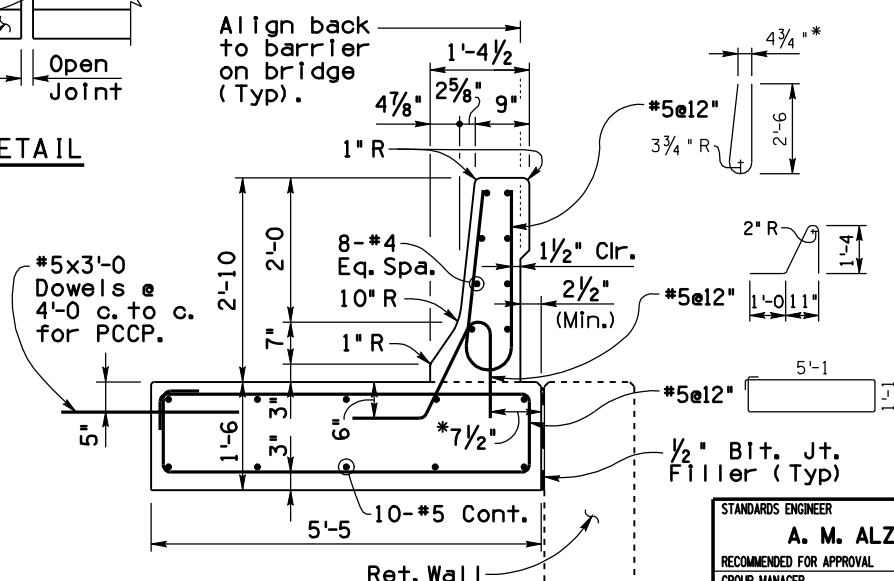


SECTION A-A



SECTION B-B

\*Varies at taper length



SECTION

Continuous Barrier With Footing

### GENERAL NOTES:

Construction Specification - Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.

Design Specifications - AASHTO LRFD Bridge Design Specifications, 7th Edition 2014.

This barrier has been successfully crash tested and is structurally evaluated as meeting the requirements of NCHRP Report 350 Test Level 4.

All Concrete shall be Class "S" (f'c = 4000 psi).

Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60. All reinforcing shall be epoxy coated at locations above EL.4000 ft.

All bends and hooks shall meet the requirements of AASHTO LRFD Article 5.10. All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

All reinforcing steel shall have 2 inch clear cover unless noted otherwise.

Concrete barriers on continuous superstructures shall have 1/2" bituminous joint filler in open joints over piers. See bridge drawings for details.

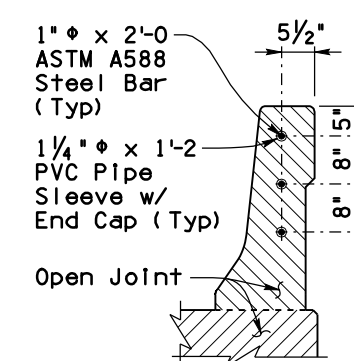
Imbed 1/2", Bridge Number and Year Built, using 1 1/2" w x 2" h number impressions in concrete, located as shown at the approach end of the outside lane.

Anchorage bars are included in the pay item for barrier (Item No. 6011140).

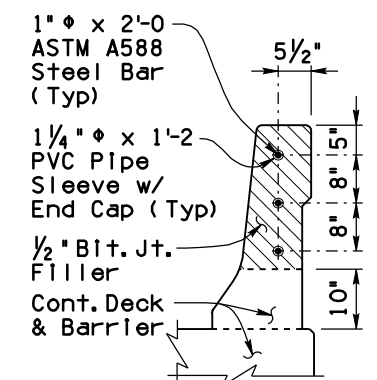
Omit bridge barrier transition when concrete barrier is continuous beyond bridge.

Dimensions shall not be scaled from drawings.

Item No. 6011140 F-SHAPE BRIDGE CONCRETE BARRIER AND TRANSITION (34")  
Measure: Linear Foot



OPEN JOINT DETAIL  
At Expansion Joints



OPEN JOINT DETAIL  
Over Continuous Piers

STANDARDS ENGINEER	A. M. ALZUBI
RECOMMENDED FOR APPROVAL	
GROUP MANAGER	D. L. EBERHART
APPROVED	
STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	12/17 DATE

ARIZONA DEPARTMENT OF TRANSPORTATION  
INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION  
BRIDGE GROUP STANDARD DRAWING

F-SHAPE BRIDGE CONCRETE BARRIER  
AND TRANSITION (34")

DRAWING NO.  
SD 1.01

PRIOR DISTRIBUTION DATE

## PLAN

## ELEVATION

SECTION A-A

SECTION B-B

### JOINT BAR DETAIL

SECTION D-D

SECTION 

\*Varies at  
taper length

GENERAL NOTES:

Construction Specification - Arizona Department of  
Transportation Standard Specifications for Road  
and Bridge Construction, latest Edition.

Design Specifications - AASHTO LRFD Bridge Design Specifications, 7th Edition 2014.

This barrier has been successfully crash tested and is structurally evaluated as meeting the requirements of NCHRP Report 350 Test Level 5.

All Concrete shall be Class "S" ( $f'_c = 4000$  psi).

Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60. All reinforcing shall be epoxy coated at locations above EL.4000 ft.

All bends and hooks shall meet the requirements of AASHTO LRFD Article 5.10. All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

All reinforcing steel shall have 2 inch clear cover unless noted otherwise.

Concrete barriers on continuous superstructures shall have 1/2" bituminous joint filler in open joints over piers. See bridge drawings for details.

Imbed  $\frac{1}{2}$ ", Bridge Number and Year Built, using  $1\frac{1}{2}$ " w x 2" h number impressions in concrete, located as shown at the approach end of the outside lane.

Anchorage bars are included in the pay item for barrier ( Item No. 6011141).

Omit bridge barrier transition when concrete barrier is continuous beyond bridge.

Dimensions shall not be scaled from drawings.

Item No. 6011141 F-SHAPE BRIDGE CONCRETE  
BARRIER AND TRANSITION (44")  
Measure: Linear Foot

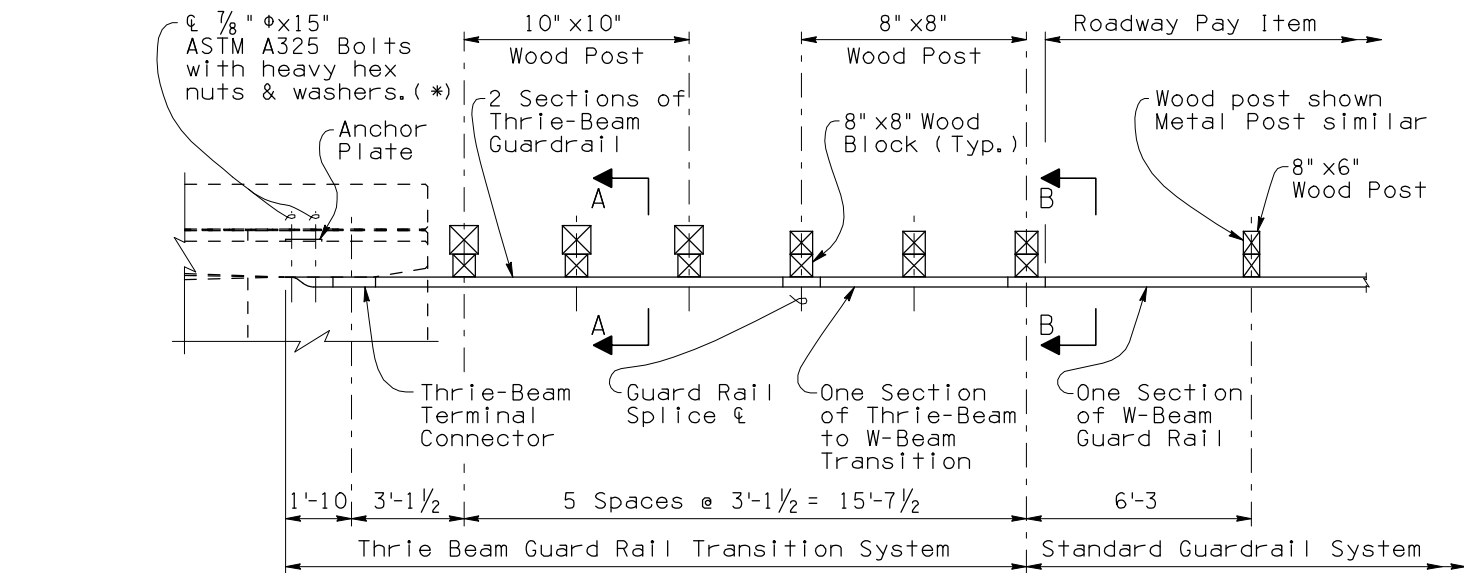
### OPEN JOINT DETAIL At Expansion Joints

### OPEN JOINT DETAIL Over Continuous Piers

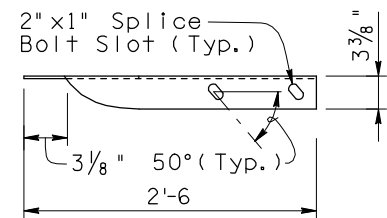
STANDARDS ENGINEER <b>A. M. ALZUBI</b> RECOMMENDED FOR APPROVAL GROUP MANAGER <b>D. L. EBERHART</b> APPROVED STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	12/17 DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING  <b>F-SHAPE BRIDGE CONCRETE BARRIER          AND TRANSITION (44")</b>	DRAWING NO.  <b>SD 1.02</b>

Note to Designer:  
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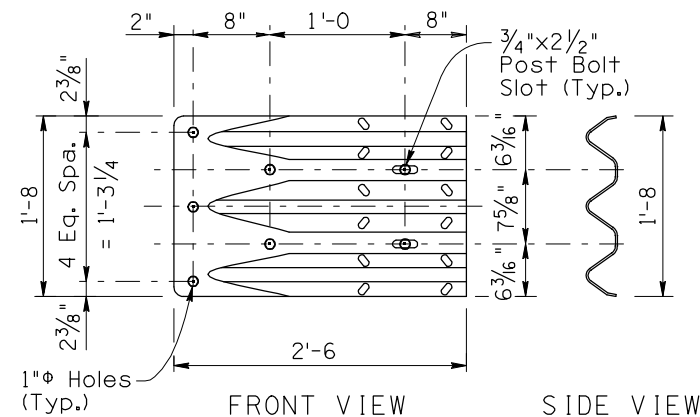
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	Original Issue	6.UH.	8-99
5	General Update	6.UH.	11-07
6	Barrier height reference	6.UH.	6-12
7		.	



PLAN



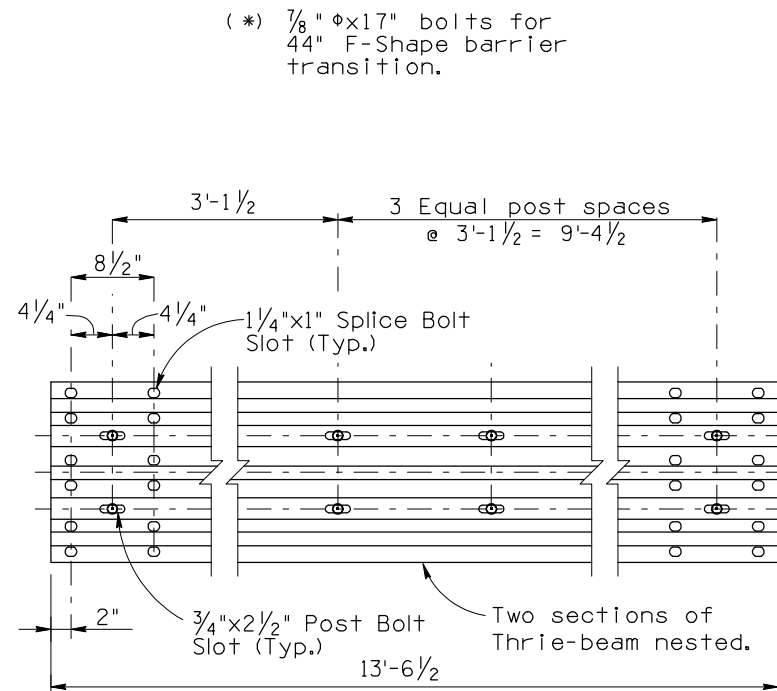
TOP VIEW



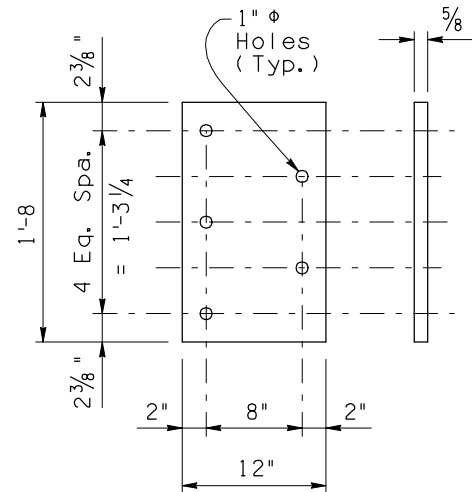
FRONT VIEW

SIDE VIEW

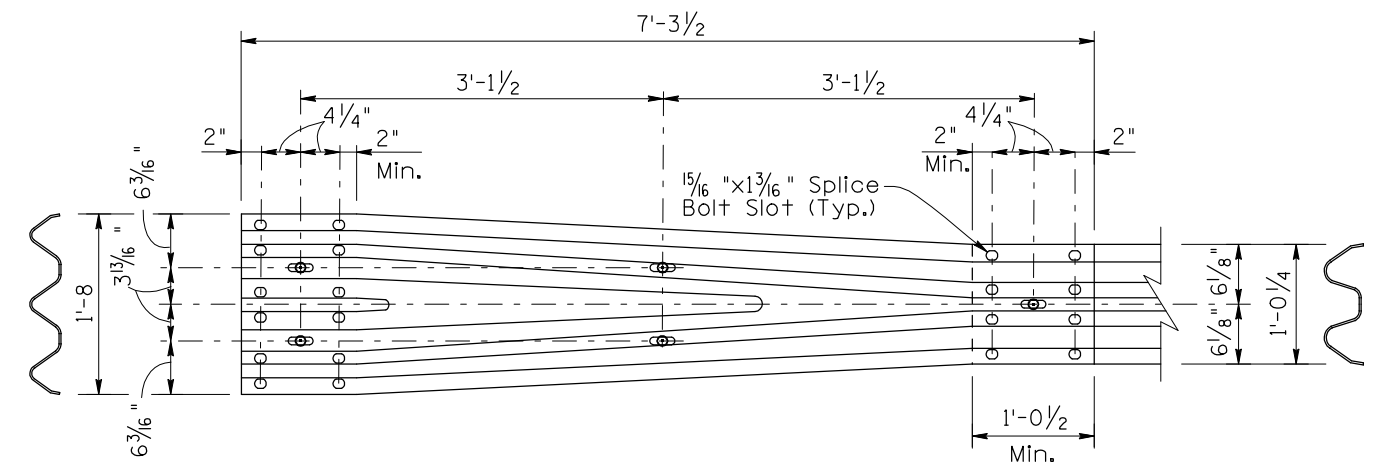
THRIE BEAM TERMINAL CONNECTOR



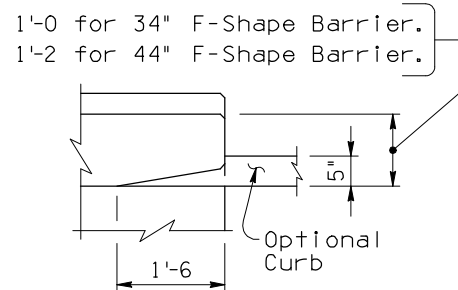
THRIE BEAM ELEVATION



ANCHOR PLATE

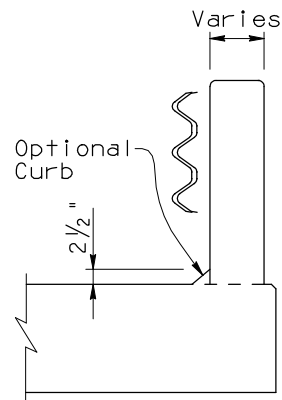


TRANSITION ELEVATION



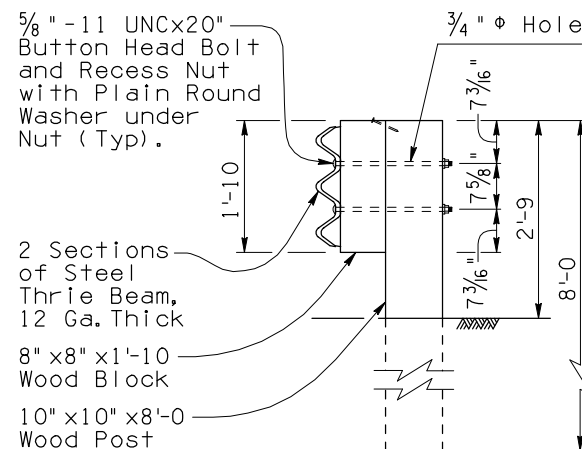
PART. PLAN

(Showing Opt. Curb)

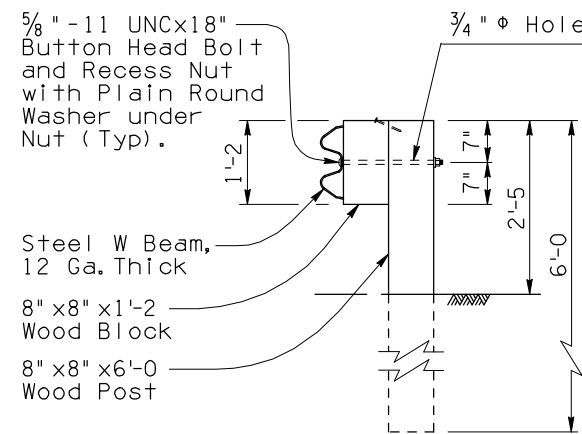


END VIEW

(Showing Opt. Curb)



SECTION A-A



SECTION B-B

## GENERAL NOTES:

Thrie Beam Transition Hardware provided is per AASHTO-AGC-ARTBA Joint Committee Task Force 13 Report.

Structural steel shall conform to ASTM Specification A36 unless noted otherwise.

Anchor plates, terminal connectors and thrie beams shall be galvanized after fabrication in accordance with ASTM A123 unless noted otherwise. All bolts, nuts and washers shall be galvanized in accordance with the requirements of ASTM A153. At the contractors option, stainless steel bolts and washers may be used. They shall conform to or exceed the mechanical requirements of ASTM A325. Provide additional washers, as needed, for longer bolt length.

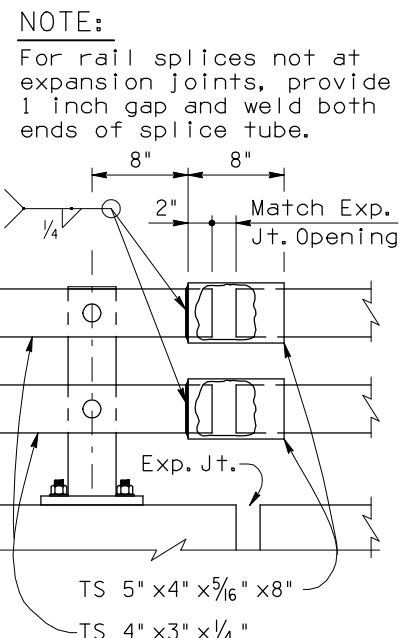
Overlap of the terminal connector, thrie beam, transition and guardrails shall be in the direction of the adjacent traffic lane.

Dimensions shall not be scaled from drawings.

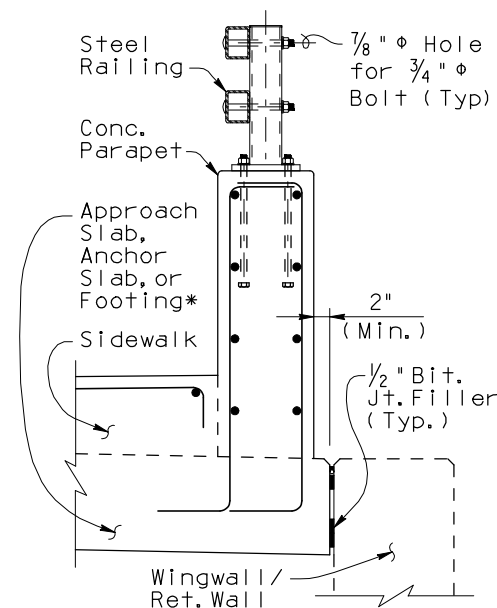
Item No. 9050430 THRIE BEAM GUARD RAIL TRANSITION SYSTEM  
Measure: Each

DESIGN APPROVED <i>Shafiq H. Hasan</i>		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>BRIDGE GROUP STRUCTURE DETAIL</b>	
APPROVED FOR DISTRIBUTION <i>Teon A. Nehme</i>		THRIE BEAM GUARD RAIL TRANSITION SYSTEM	
ROUTE	PROJECT NO.	FA NO.	DRAWING NO. SD 1.03
LOCATION			SHEET NO. OF

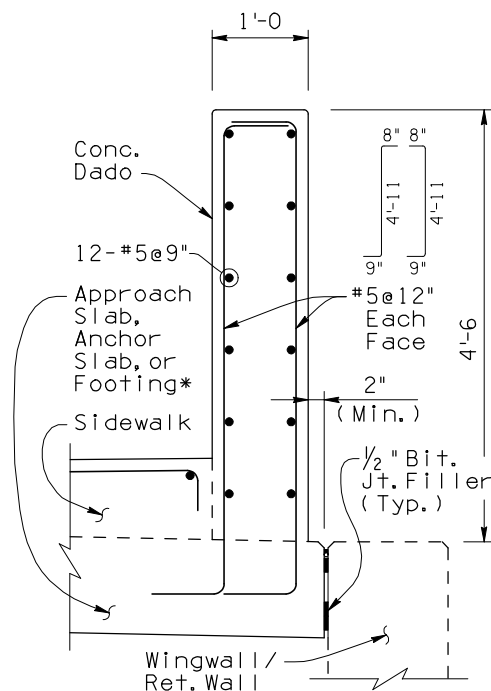
NO	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	Original Issue	S.J.H.	8-99
2	Bld Item No. Note	S.J.H.	9-99
3	General Update, Revised width of parapet and sidewalk.	S.J.H.	3-09
4	*	*	



DETAIL A  
(Exp. Splice Shown)



SECTION C-C



SECTION C-C

See Bridge Plans for rail layout, elevation, joint locations and rail end treatments.

All exposed steel edges shall be ground smooth. All structural steel rail assembly components shall be galvanized after fabrication in accordance with ASTM A123. All galvanizing that has been damaged in handling, transportation or welding shall be repaired by the application of a paste compound of an approved zinc powder and flux.

All post bolt heads shall be on sidewalk side. All bolts, nuts and washers shall be galvanized in accordance with the requirements of ASTM A153.

For fence attachment details, see Structure Detail SD 1.05.  
(Lower rail tube is not required with fence.)

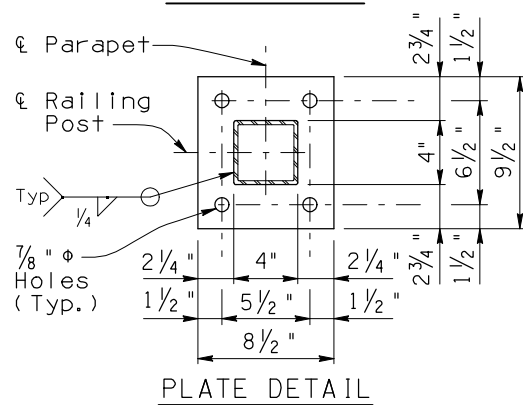


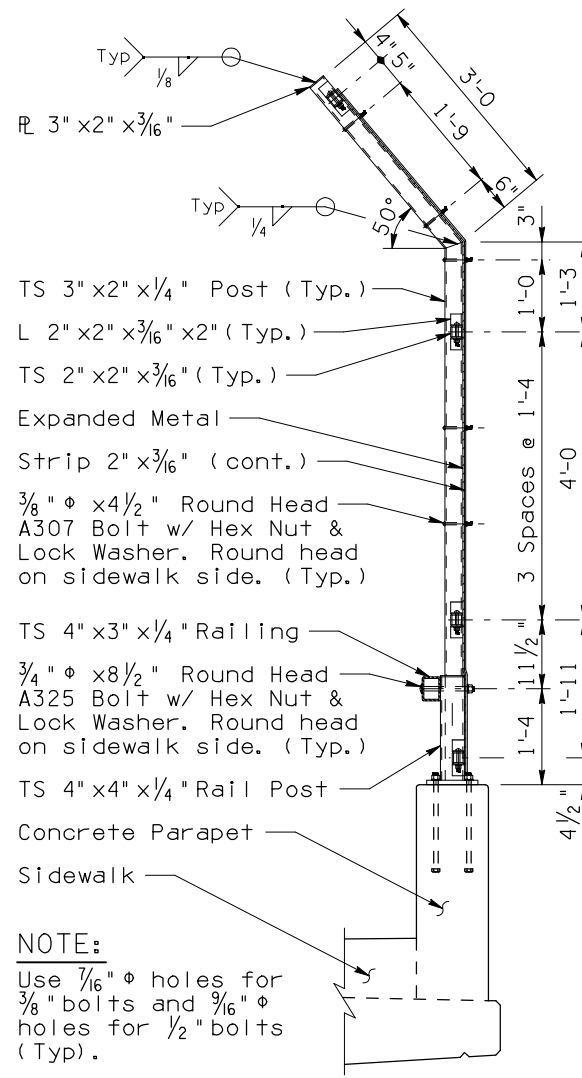
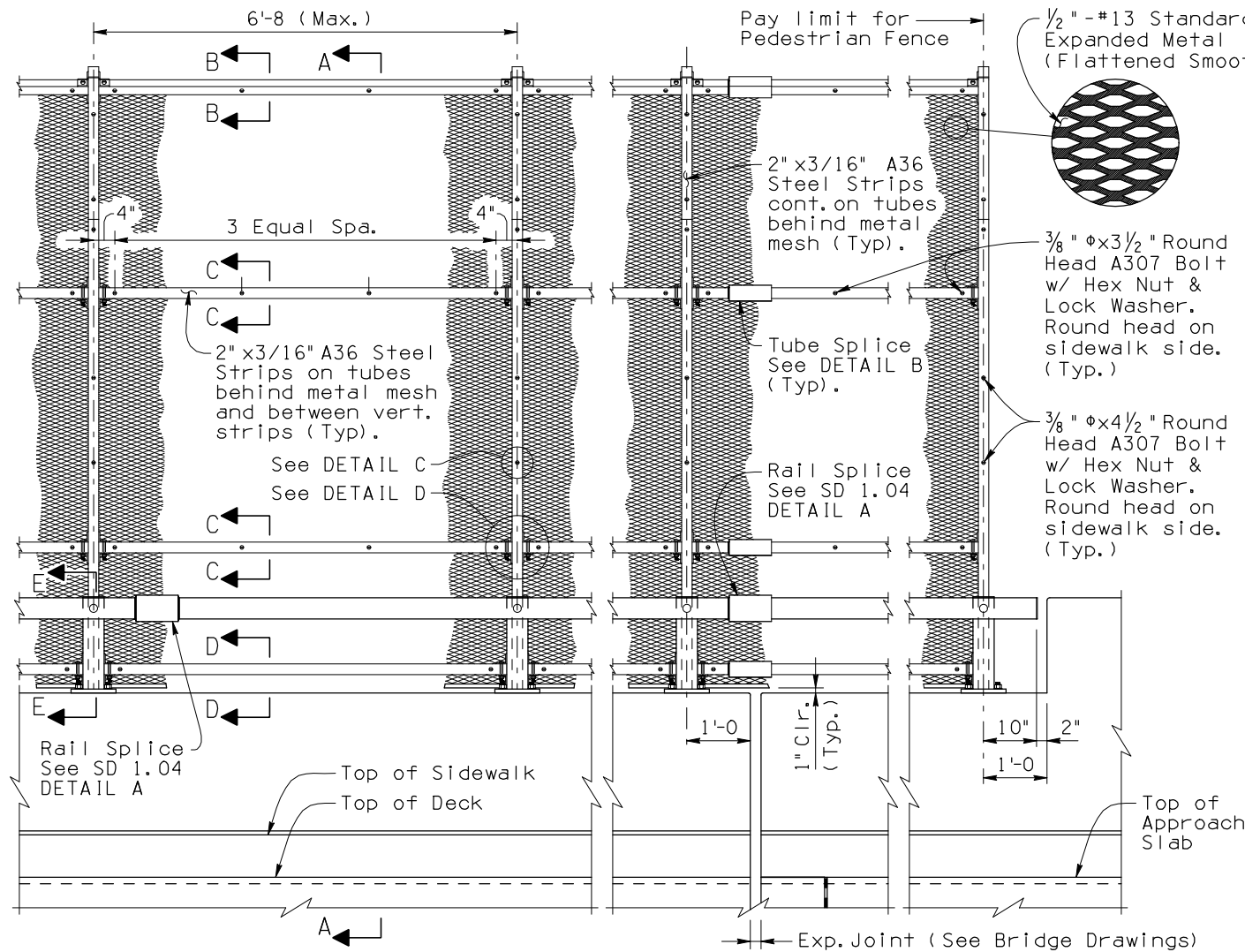
PLATE DETAIL

Item No. 6011132 COMBINATION PEDESTRIAN-TRAFFIC  
BRIDGE RAILING  
Measure: Linear Foot

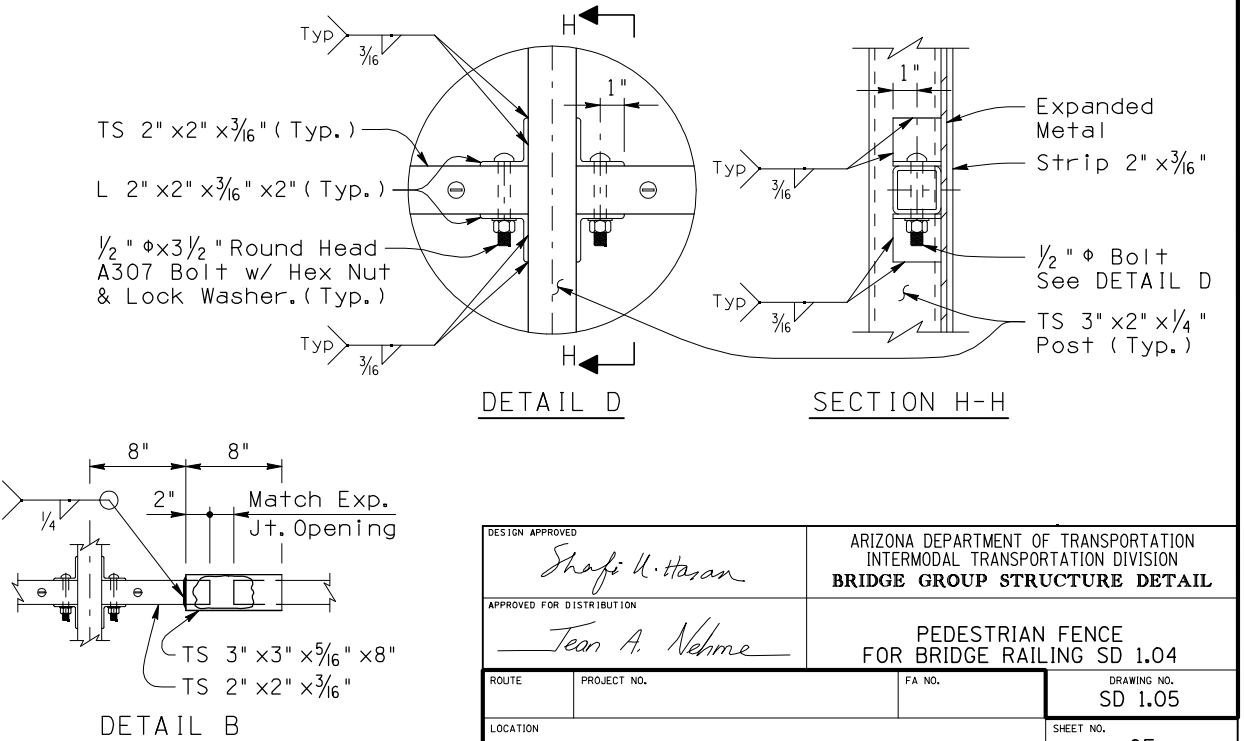
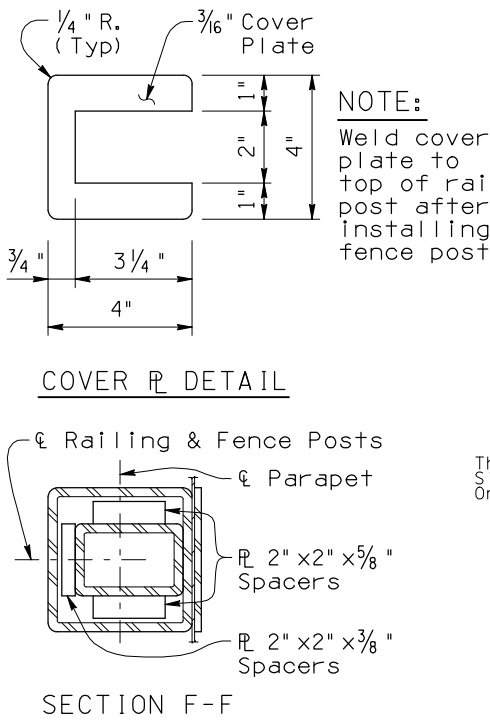
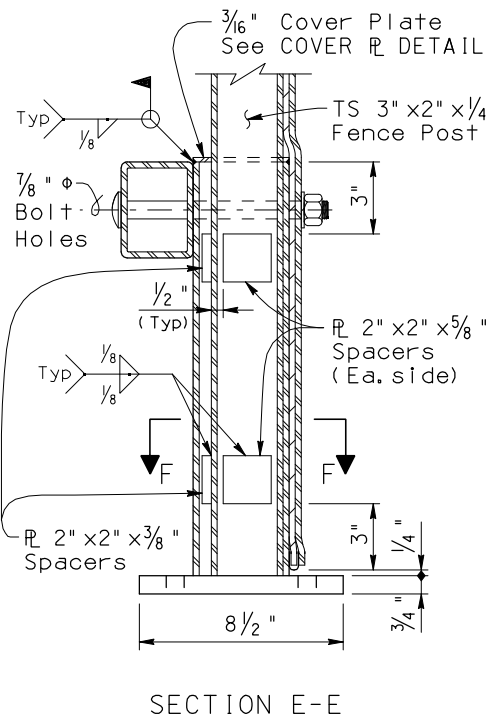
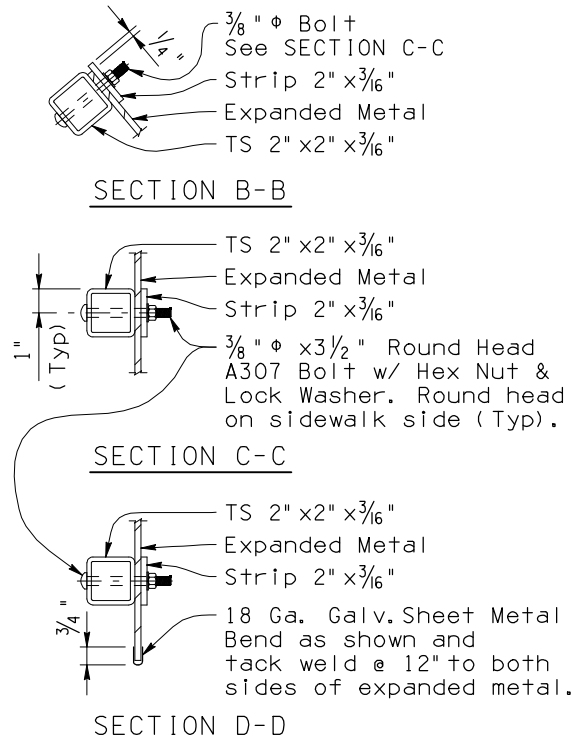
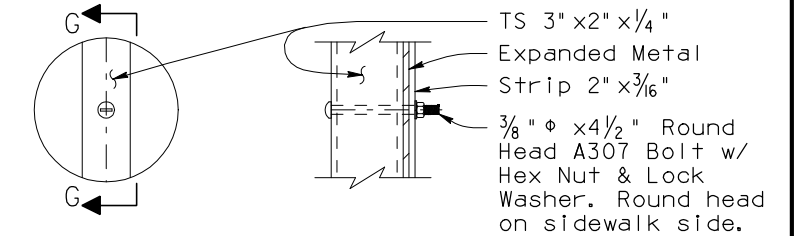
DESIGN APPROVED <i>Shafiq U. Hasan</i>		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>BRIDGE GROUP STRUCTURE DETAIL</b>	
APPROVED FOR DISTRIBUTION <i>Tean A. Nehme</i>		COMBINATION PEDESTRIAN-TRAFFIC BRIDGE RAILING	
ROUTE	PROJECT NO.	FA NO.	DRAWING NO. SD 1.04
LOCATION			SHEET NO. OF

Note to Designer:  
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NO.	DESCRIPTION OF REVISIONS	MADE BY	DATE
1	Original Issue	6/04	8-99
2	Rev. from No.	6/04	9-99
3	Lower fence, modify bolts to A307, add rail splice, & post weld	6/04	12-00
4	General Update, Revised material specs.	6/04	3-09



**GENERAL NOTES:**  
Construction Specification - Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.  
Design Specifications - AASHTO LRFD Bridge Design Specifications, 4th Edition 2007.  
Structural tubing (TS) shall be ASTM A500 Grade B. Expanded metal shall conform to ASTM F1267 Type 11, Class 2, Grade A. Expanded metal shall be flattened smooth (No sharp edges). All other structural steel shall conform to ASTM A36 unless noted otherwise. All fence components and hardware shall be Galvanized.  
All welding shall conform to the requirements of the American Welding Society, ANSI/AASHTO/AWS D1.5 Bridge Welding Code, latest Edition.  
See Bridge Drawings for location and length of pedestrian fence.  
See SD 1.04 for details of concrete parapet, sidewalk, railing and applicable notes.  
Dimensions shall not be scaled from drawings.  
Payment for PEDESTRIAN FENCE is included in the pay item for COMBINATION PEDESTRIAN-TRAFFIC BRIDGE RAILING (SD 1.04) (Item No. 6011132).

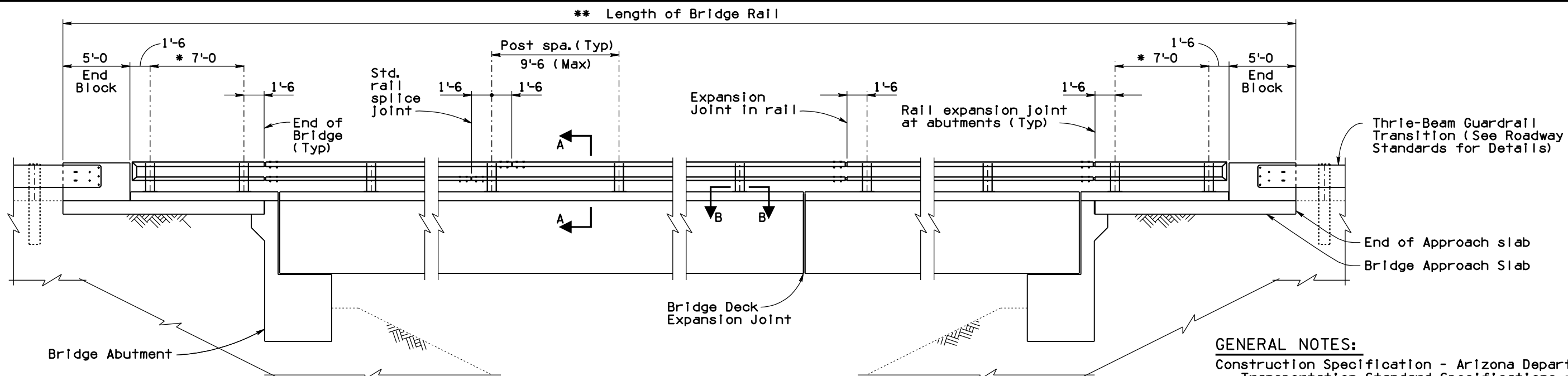


DESIGN APPROVED <i>Shafiq U. Hasan</i>		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>BRIDGE GROUP STRUCTURE DETAIL</b>	
APPROVED FOR DISTRIBUTION <i>Tam A. Nehme</i>		PEDESTRIAN FENCE FOR BRIDGE RAILING SD 1.04	
ROUTE	PROJECT NO.	FA NO.	DRAWING NO. SD 1.05
LOCATION			SHEET NO. OF

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06/12

PRIOR DISTRIBUTION DATE



**NOTE:**  
For Sections A-A and B-B see SD1.06 (2 of 4)

### TWO TUBE BRIDGE RAIL ELEVATION

#### GENERAL NOTES:

Construction Specification - Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.

Design Specifications - AASHTO LRFD Bridge Design Specifications, 7th Edition 2014.

This barrier has been successfully crash tested and is structurally evaluated as meeting the requirements of NCHRP Report 350 Test Level 4.

All Concrete shall be Class "S" ( $f'c = 4500$  psi).

Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60. All reinforcing shall be epoxy coated at locations above EL. 4000 ft.

All bends and hooks shall meet the requirements of AASHTO LRFD Article 5.10. All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

All reinforcing steel shall have 1/2 inch clear cover unless noted otherwise.

Structural tubing (TS) shall be ASTM A500 Grade B. Anchor plates, posts and other structural steel shall conform to ASTM A36 unless noted otherwise.

All anchor bolts, studs, nuts and washers shall be ASTM A325 and shall be galvanized in accordance with the requirements of ASTM A153.

Labor and materials for steel railing assembly, curb, end block, anchorage bars and hardware are included in the pay item (Item No. 6011134).

Dimensions shall not be scaled from drawings.

Item No. 6011134 TWO TUBE BRIDGE RAIL  
Measure: Linear Foot

\* Dimension shown is for a typical 15'-0" long approach slab. Spacing may be adjusted up to a maximum of 9'-6" as needed. Additional posts shall be added for dimensions greater than 9'-6".

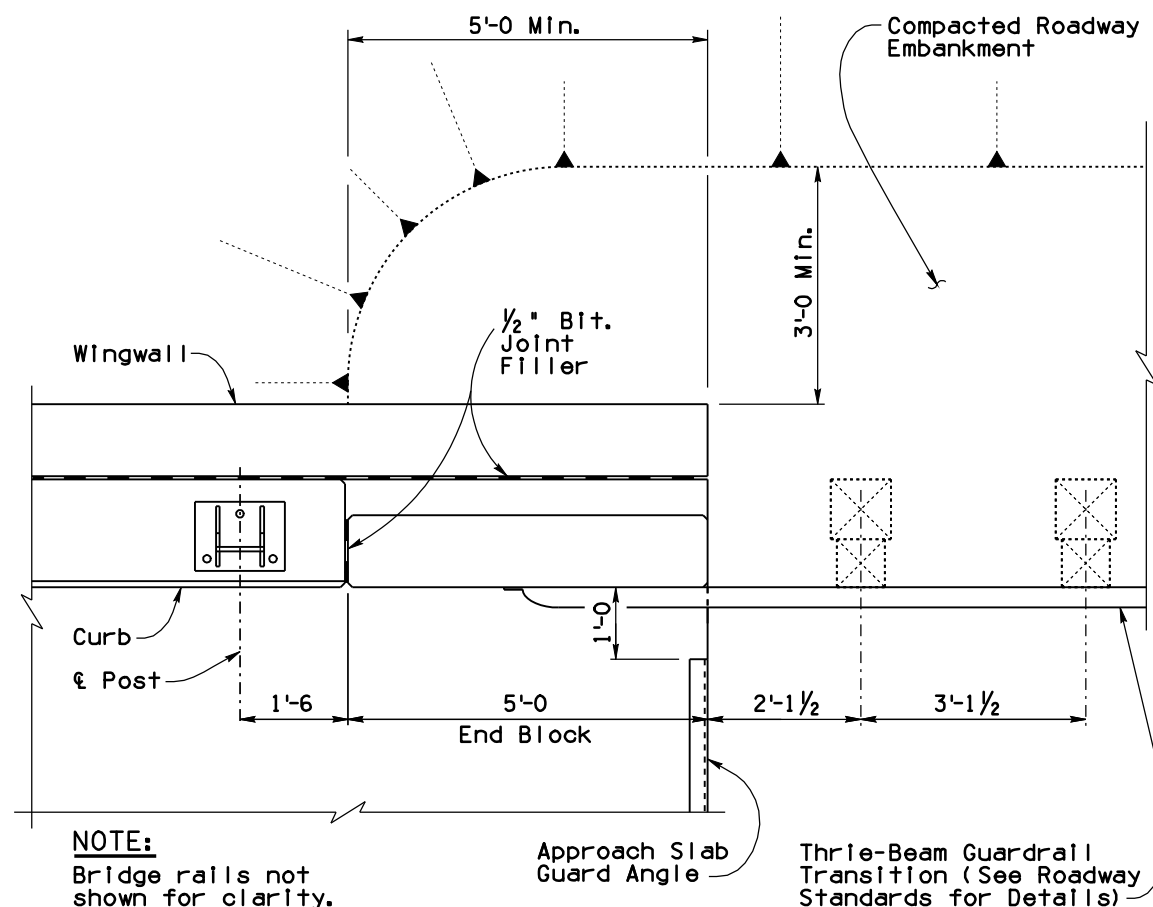
\*\* Project bridge plans shall show the length of bridge rail and the layout of posts, rails, joint locations, approach slabs, Guardrail transitions and elevations.

#### RAILING NOTES:

All posts shall be vertical. Panel lengths of rail shall be continuous and attached to a minimum of two posts. Rail splices shall be located at expansion joints and shall be constructed as detailed.

All exposed steel edges shall be ground smooth. All structural steel rail assembly components shall be galvanized after fabrication in accordance with ASTM A123. All galvanizing that has been damaged in handling, transportation or welding shall be repaired by the application of a paste compound of an approved zinc powder and flux.

All welding shall conform to the requirements of the American Welding Society, ANSI/AASHTO/AWS D1.5 Bridge Welding Code, latest Edition.



**NOTE:**  
Bridge rails not shown for clarity.

### PLAN (End Block At Guardrail Transition)

STANDARDS ENGINEER <b>A. M. ALZUBI</b> RECOMMENDED FOR APPROVAL GROUP MANAGER <b>D. L. EBERHART</b> APPROVED STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING	
	TWO TUBE BRIDGE RAIL	DRAWING NO. <b>SD 1.06</b>
		Sheet 1 of 4
	DATE 12/17	

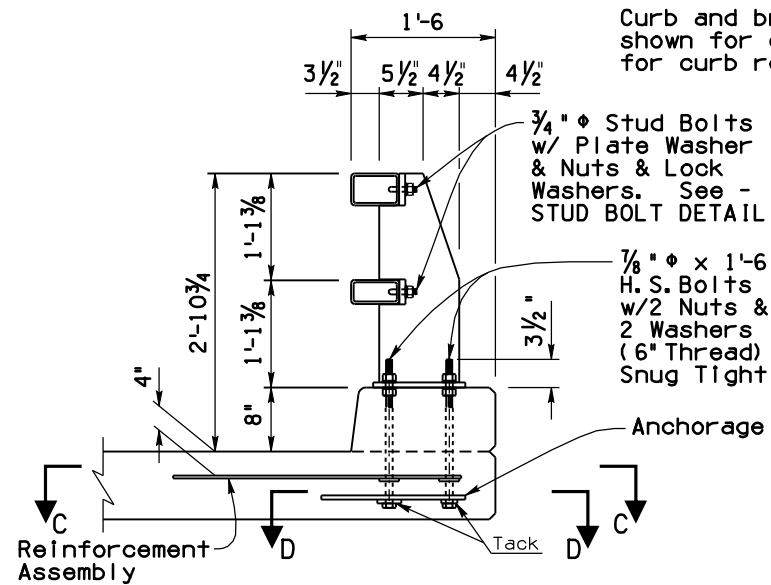
Note to Designer:  
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06/12

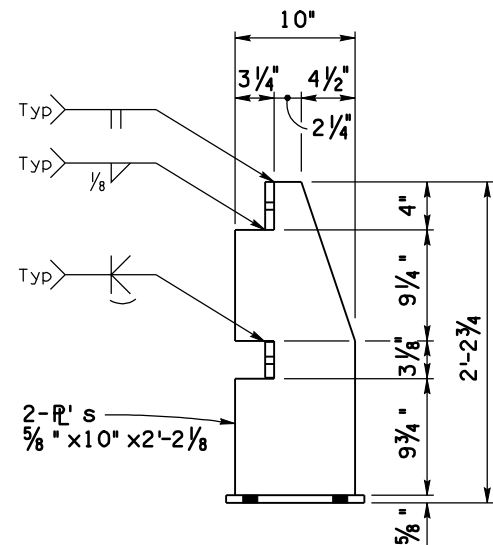
PRIOR DISTRIBUTION DATE

#### NOTE:

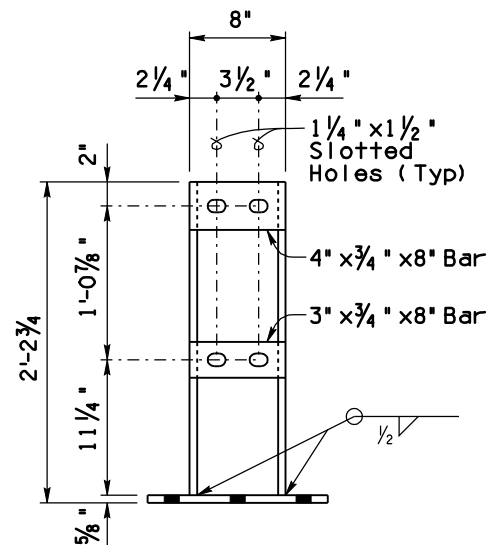
Curb and bridge deck reinforcement not shown for clarity. See SD 1.06(4 of 4) for curb reinforcing.



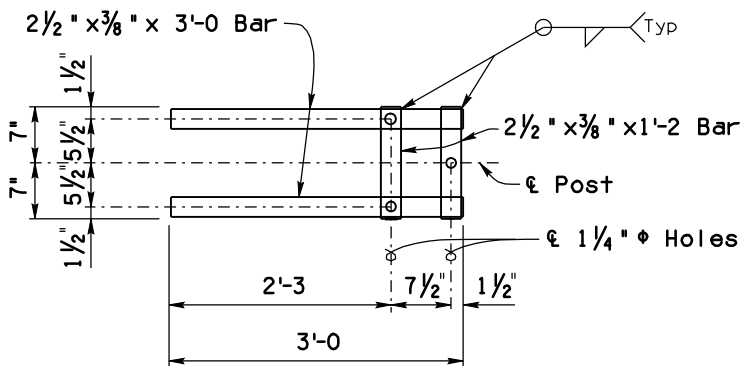
SECTION A-A



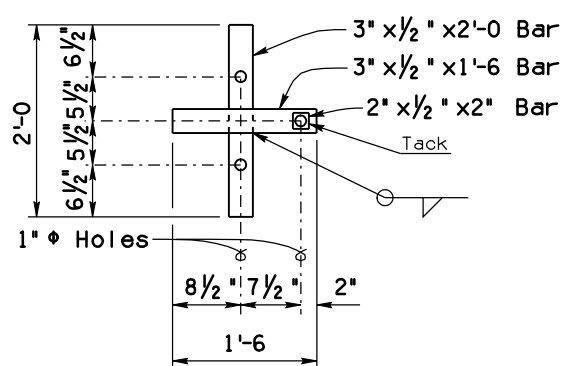
POST DETAIL  
(Side View)



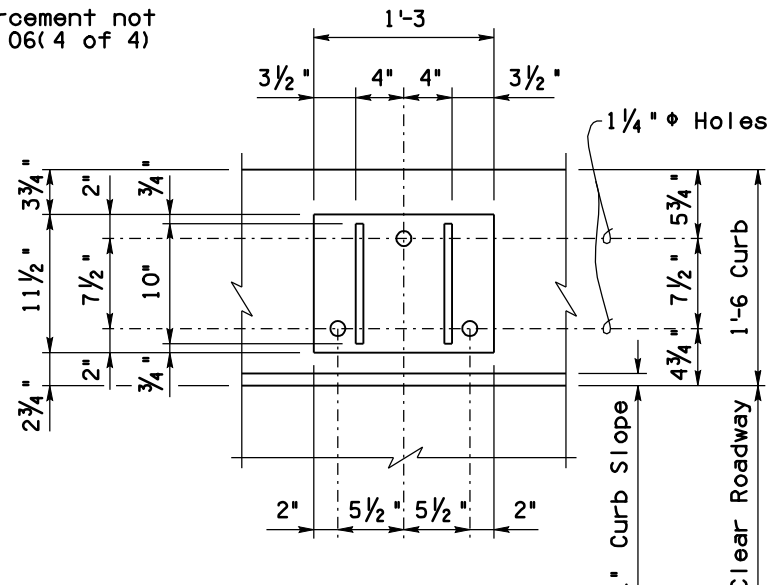
POST DETAIL  
(Elevation)



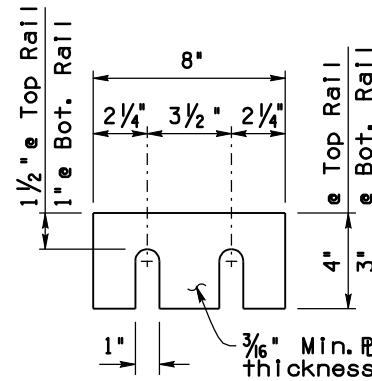
SECTION C-C  
(Reinforcement Assembly)



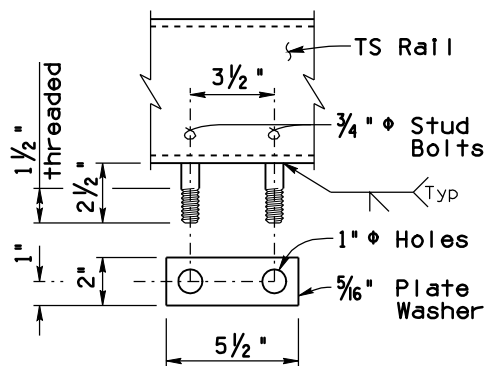
SECTION D-D  
(Anchorage)



SECTION B-B



SHIM PLATE DETAIL



STUD BOLT DETAIL

#### INSTALLATION NOTES:

1. Venting and pick-up holes in rails and sleeves shall be shown on fabricator's shop plans.
2. Anchor bolts may be tack welded to anchorage. (Shop or field.)
3. All rough edges on posts and rails shall be ground smooth.
4. Post base (R's) shall be flat after fabrication.
5. Rails shall not be field spliced.
6. Railing posts shall be in place and in proper alignment prior to placement of curb concrete.
7. Shim plates shall be provided as necessary to provide contact of TS rails to posts. Bolted connections shall be snug tight.
8. After installation of rail, the exposed rail bolt threads shall be painted with two coats of zinc rich paint conforming to the requirements of ADOT Standard Specifications for Road and Bridge Construction.
9. Rail expansion splices shall be located in the railing panel which passes over the bridge expansion joint. See Bridge Drawings for expansion joint locations.
10. Either top or bottom rail in standard splice terminal section may be the longer rail.
11. In rehabilitation work, railing that cannot feasibly be made continuous over a minimum of two posts shall be provided with a double-bolted splice.
12. Not more than one splice shall be permitted per side of post except at expansion splices.

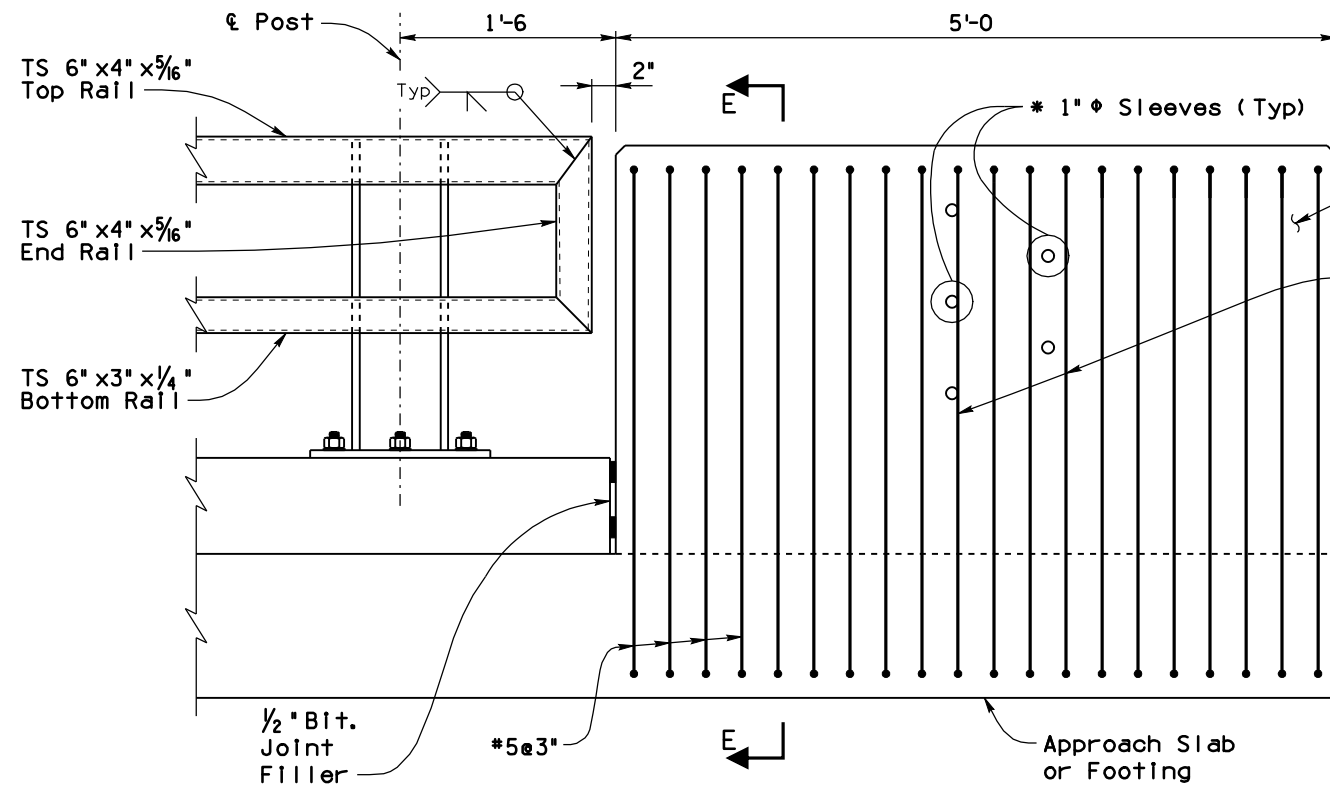
STANDARDS ENGINEER <b>A. M. ALZUBI</b> RECOMMENDED FOR APPROVAL GROUP MANAGER <b>D. L. EBERHART</b> APPROVED STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING	
	TWO TUBE BRIDGE RAIL	
	DRAWING NO. <b>SD 1.06</b> Sheet 2 of 4	



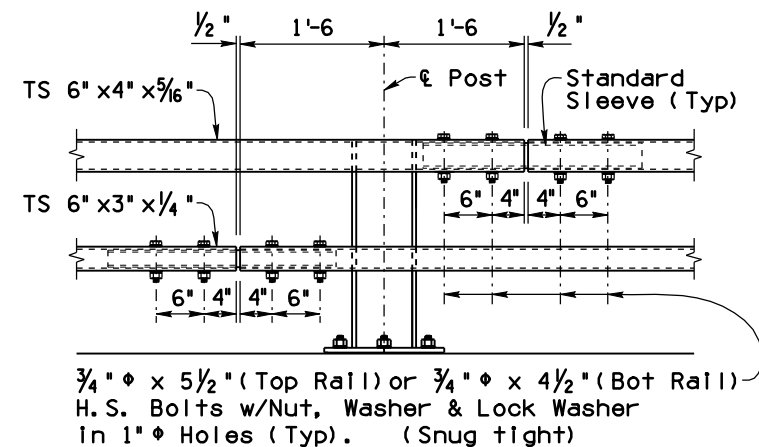
Note to Designer:  
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06/12

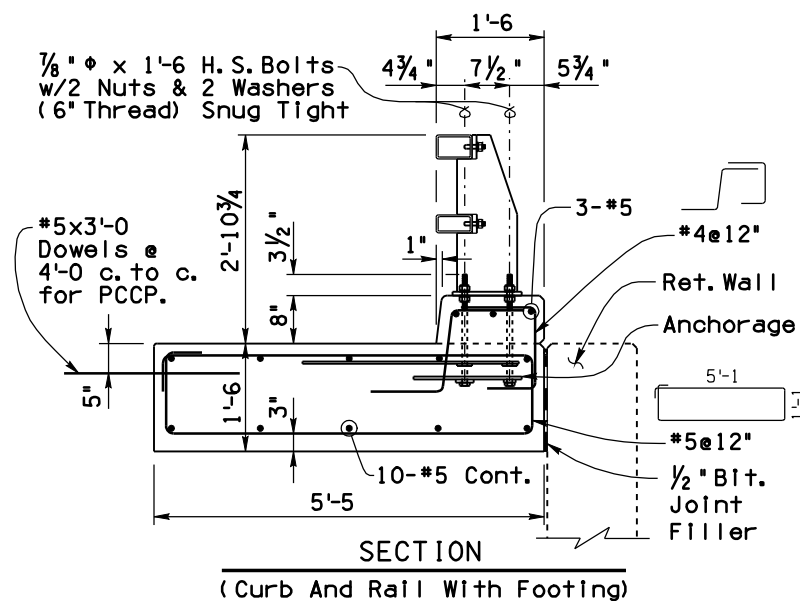
PRIOR DISTRIBUTION DATE



END BLOCK DETAIL

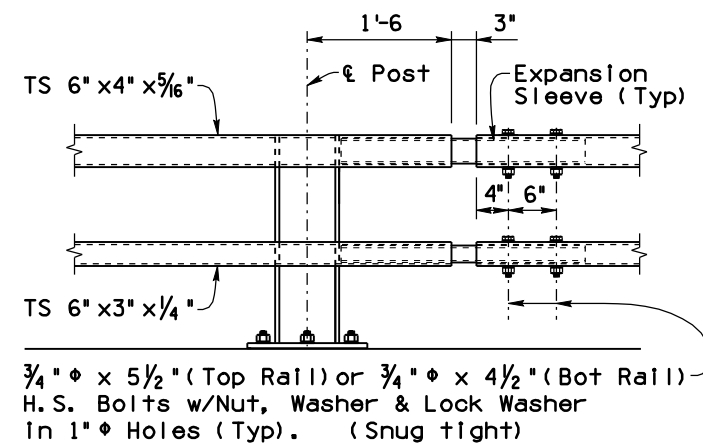


STANDARD SPLICE



SECTION

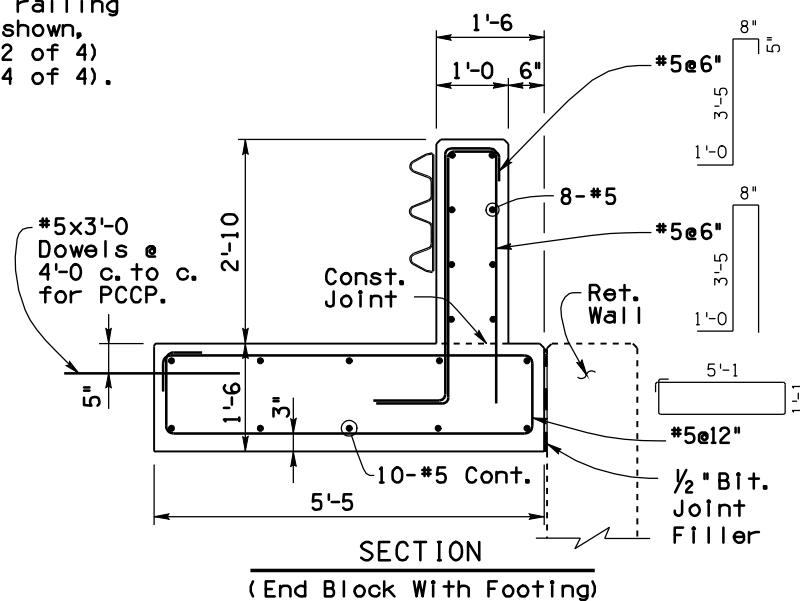
(Curb And Rail With Footing)



EXPANSION SPLICE

NOTE:

For curb and railing details not shown, See SD 1.06(2 of 4) and SD 1.06(4 of 4).

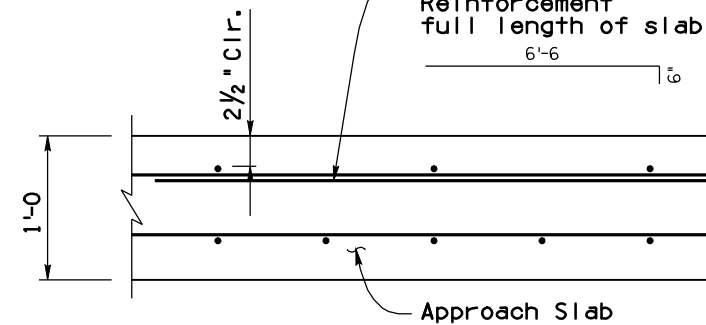


SECTION

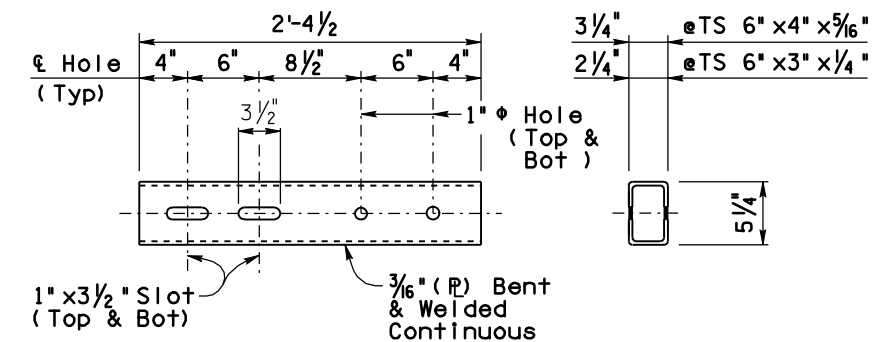
(End Block With Footing)

\* 1"  $\phi$  Sleeves (Typ)  
See Roadway Standards for Thrie-Beam Guardrail Transition Details

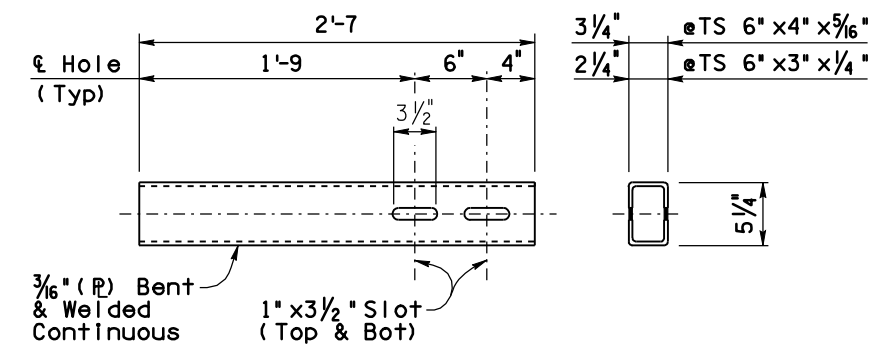
Concrete End Block  
Adjust vert. rebar spacing as necessary



SECTION E-E



STANDARD SLEEVE DETAILS



EXPANSION SLEEVE DETAILS

STANDARDS ENGINEER  
A. M. ALZUBI  
RECOMMENDED FOR APPROVAL  
GROUP MANAGER  
D. L. EBERHART  
APPROVED  
STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION  
12/17  
DATE

ARIZONA DEPARTMENT OF TRANSPORTATION  
INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION  
BRIDGE GROUP STANDARD DRAWING

TWO TUBE BRIDGE RAIL

DRAWING NO.

SD 1.06

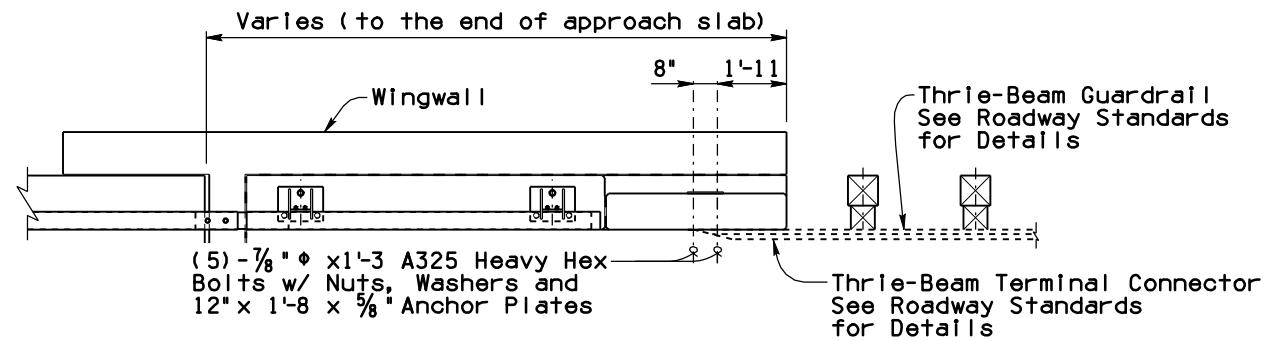
Sheet 3 of 4



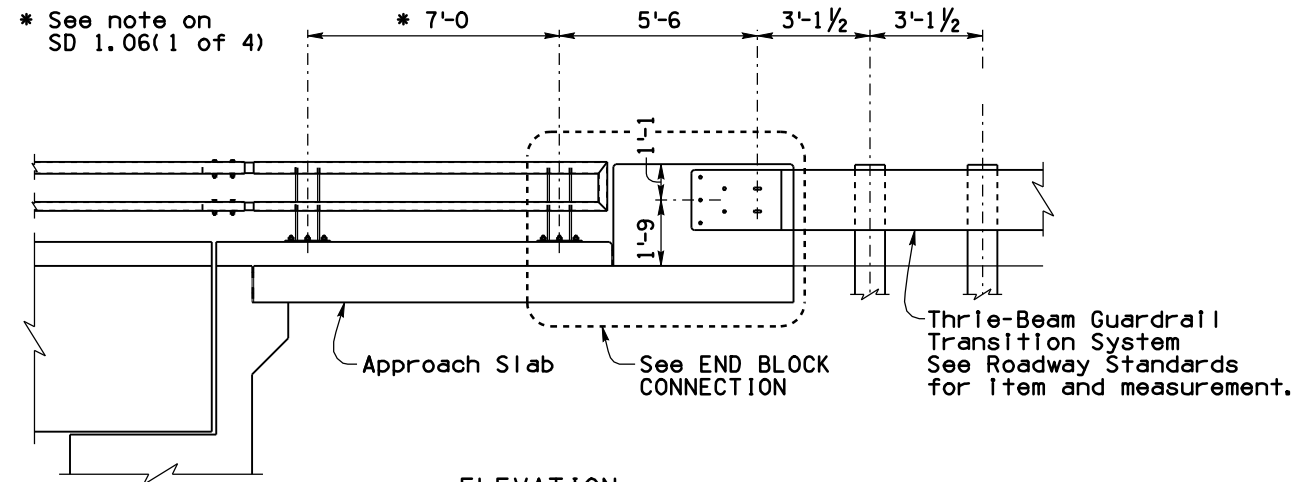
Note to Designer:  
The information presented in this Standard Drawing has been prepared in accordance with recognized engineering principles and is for general use. It should not be used for specific application without competent professional examination and verification of its suitability and applicability by a licensed professional engineer. Contents within the inner border line shall not be altered.

06/12

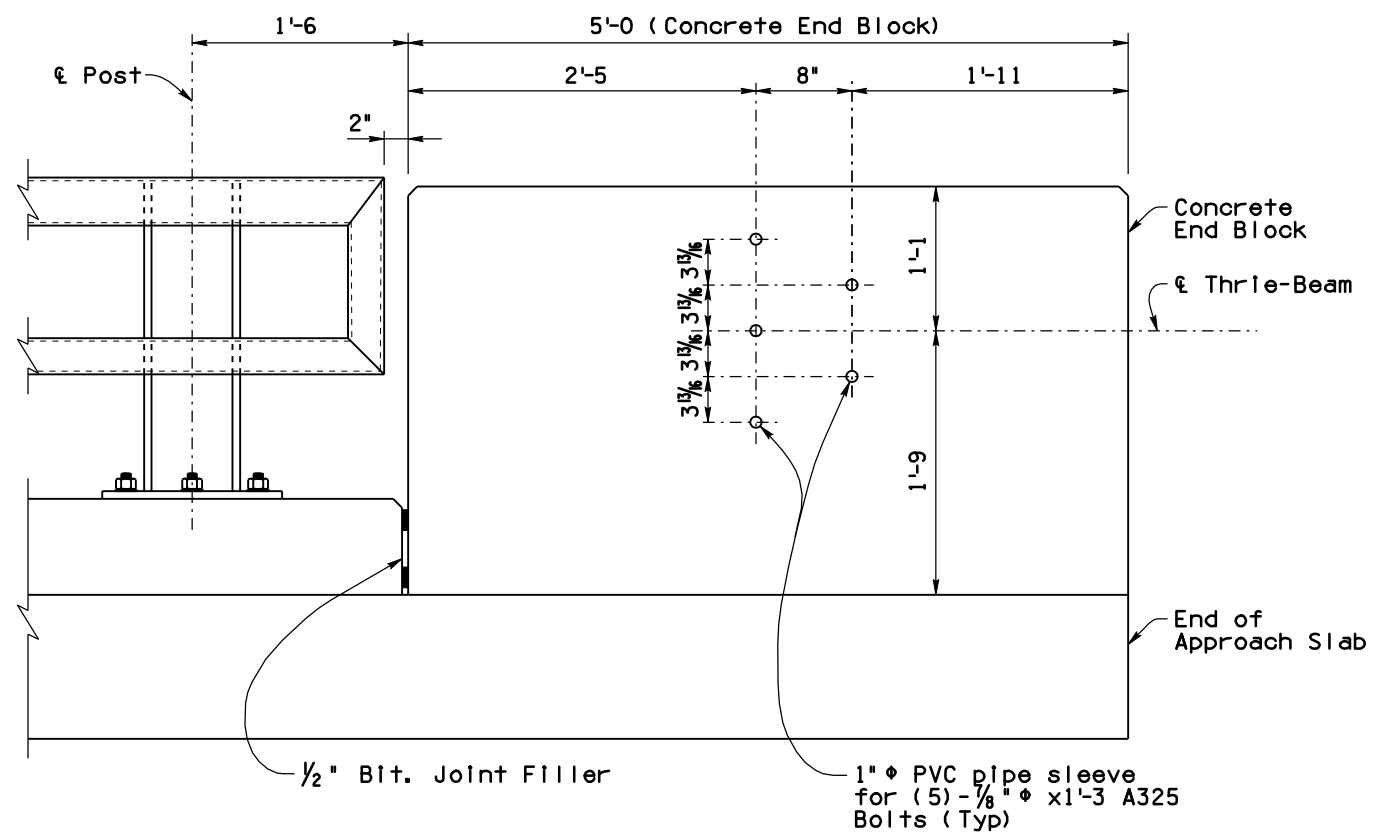
PRIOR DISTRIBUTION DATE



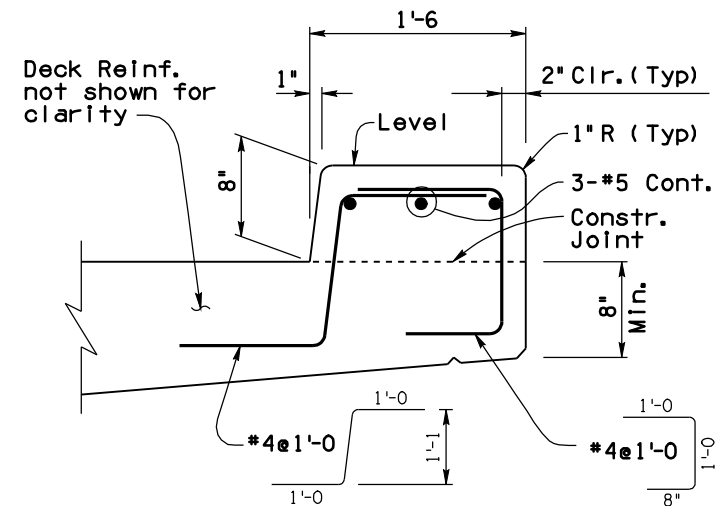
PLAN



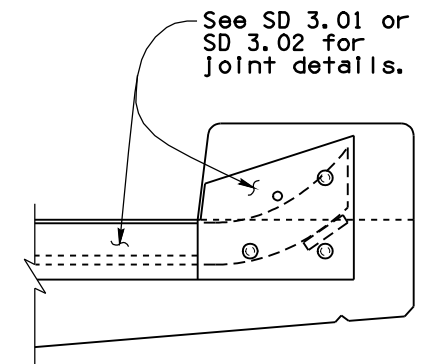
ELEVATION



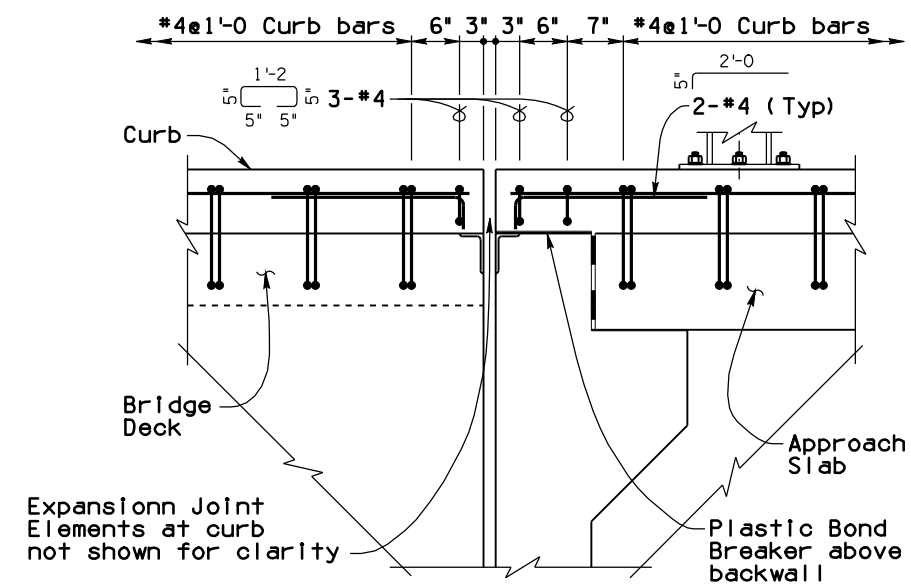
END BLOCK CONNECTION



TYPICAL CURB SECTION



CURB DETAIL AT EXPANSION JOINT



CURB DETAIL AT ABUTMENT

STANDARDS ENGINEER <b>A. M. ALZUBI</b>	
RECOMMENDED FOR APPROVAL GROUP MANAGER <b>D. L. EBERHART</b>	
APPROVED	12/17 DATE
STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	

ARIZONA DEPARTMENT OF TRANSPORTATION  
INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION  
BRIDGE GROUP STANDARD DRAWING

TWO TUBE BRIDGE RAIL

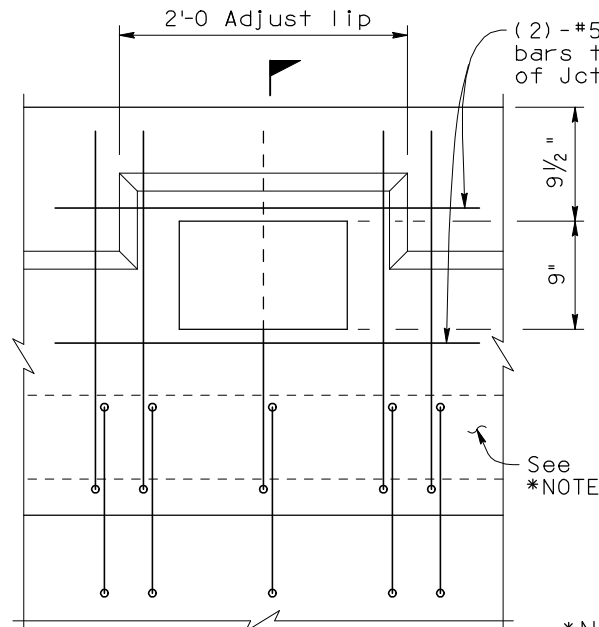
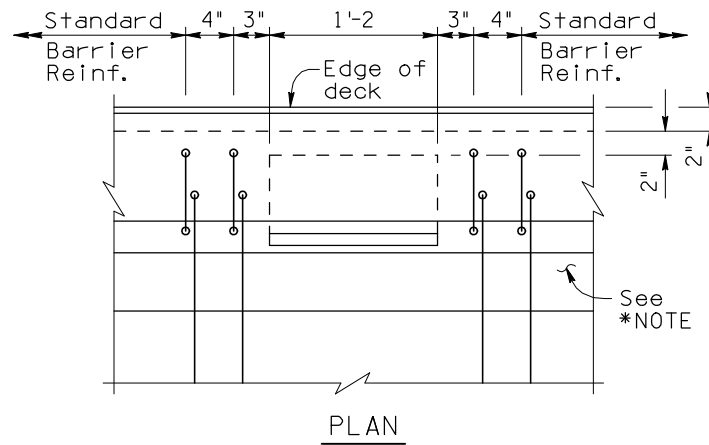
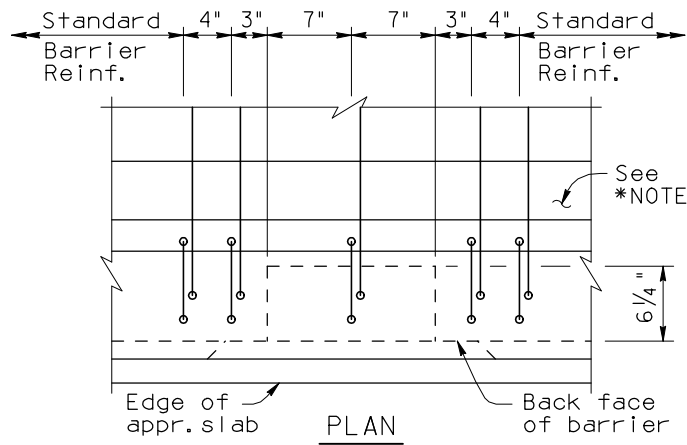
DRAWING NO.

SD 1.06

Sheet 4 of 4

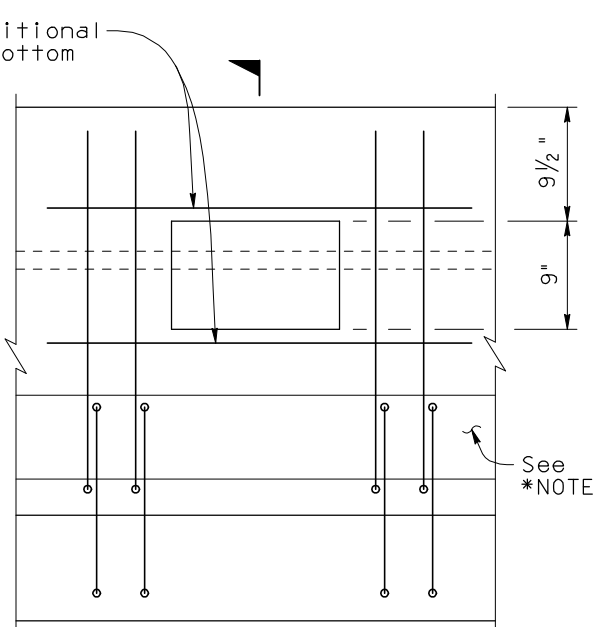
Note to Designer:  
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NO	DESCRIPTION OF REVISIONS		MADE BY	DATE
	ORIGINAL ISSUE			
1	Original Issue		H.M.S.	5-02
2	General Update		G.U.H.	4-10
3				
4				

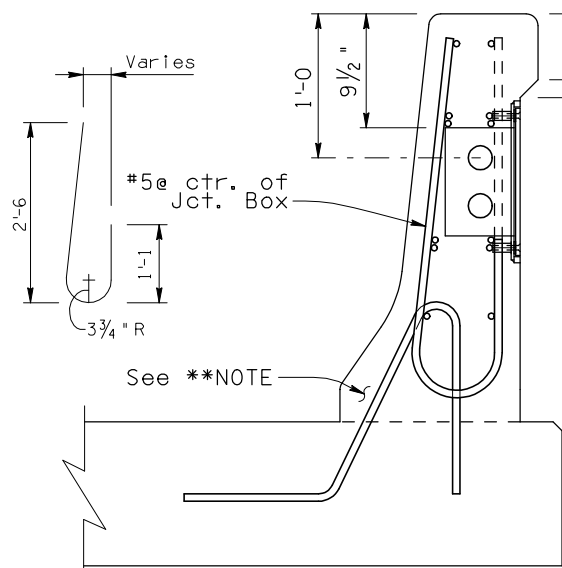


1  
ELEVATION  
(Back Face)

\*NOTE:  
Horiz. barrier  
reinforcement  
not shown for  
clarity.

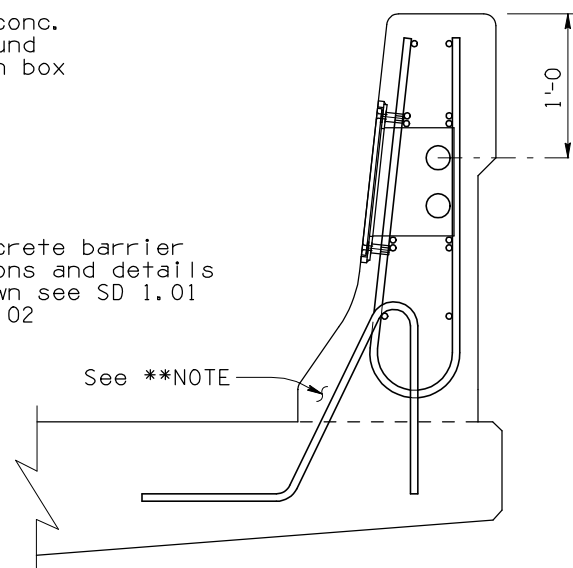


2  
ELEVATION  
(Front Face)

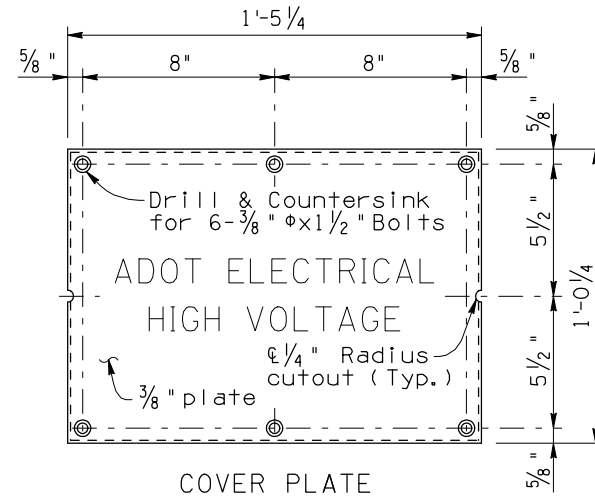


TYPE I JUNCTION BOX  
(At Approach Transition) 1

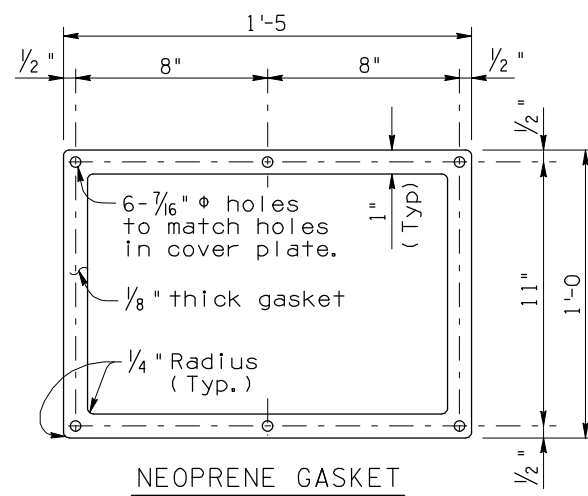
\*\*NOTE:  
For concrete barrier  
dimensions and details  
not shown see SD 1.01  
or SD 1.02



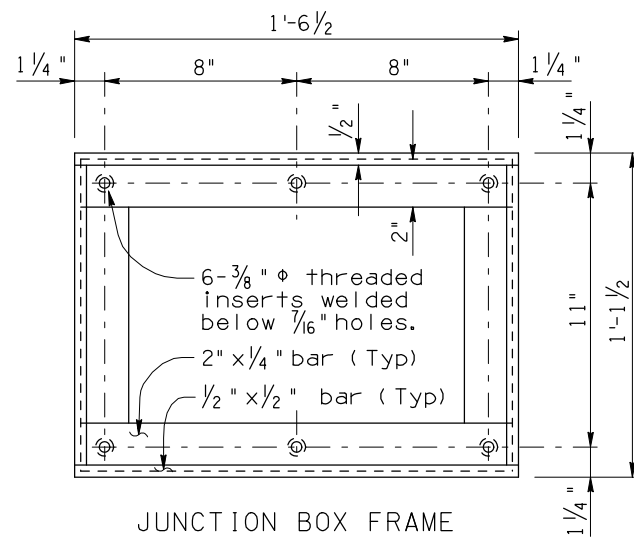
TYPE II JUNCTION BOX  
(On Bridge) 2



COVER PLATE



NEOPRENE GASKET

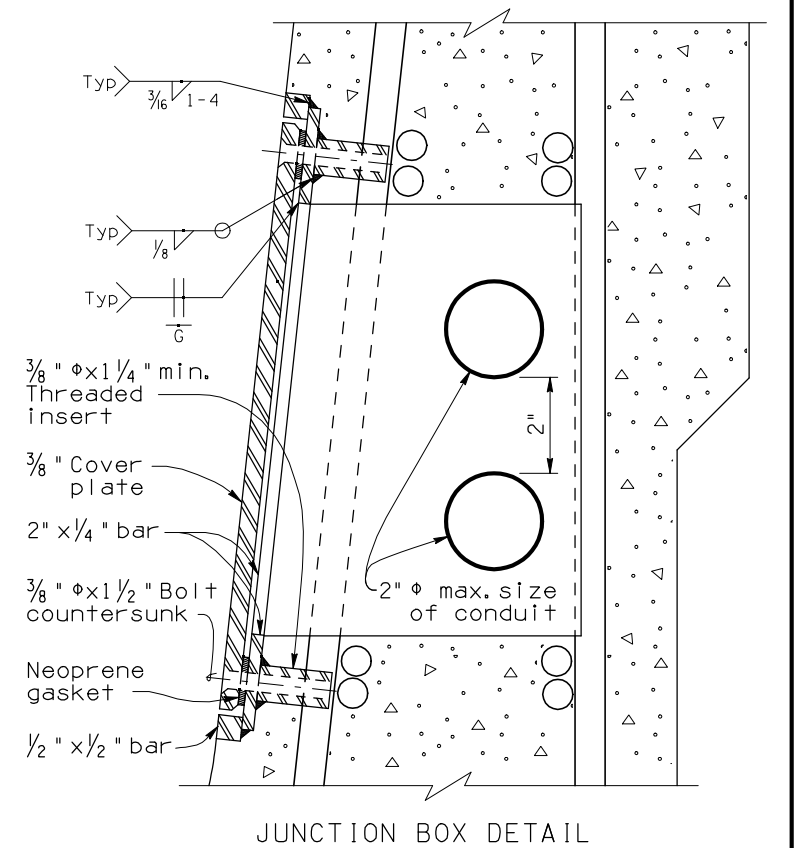


JUNCTION BOX FRAME

NOTE:  
Conduit placement in bridge barrier  
requires pre-approval by Bridge Group.  
Junction Box is shown for (32") nominal  
F-Shape barrier. Details similar for  
(42") nominal F-Shape barrier and  
other concrete bridge parapets.

GENERAL NOTES:  
Construction Specification - Arizona Department of  
Transportation Standard Specifications for Road  
and Bridge Construction, latest Edition.  
Design Specifications - AASHTO LRFD Bridge Design  
Specifications, 4th Edition 2007.  
Conduits shall not be placed in exterior barriers  
of Interstate Highway System bridges.  
Structural steel shall conform to ASTM A36.  
All bolts shall conform to ASTM A307. Threaded  
inserts shall be loop type (U.N.C. thread).  
All bolts, nuts and washers shall be galvanized in  
accordance with ASTM A153. All other steel  
shall be galvanized after fabrication in  
accordance with ASTM A123.  
Chamfer all bottom edges of cover plate 1/8" x 45°.  
Cover plate shall have 1" letters embossed 1/8" to  
say: "ADOT ELECTRICAL HIGH VOLTAGE".  
All welding shall conform to the requirements of  
the American Welding Society, ANSI/AASHTO/  
AWS D1.5 Bridge Welding Code, latest Edition.  
Dimensions shall not be scaled from drawings.

Item No. 7320475 TYPE I JUNCTION BOX  
Measure: Each  
Item No. 7320476 TYPE II JUNCTION BOX  
Measure: Each



JUNCTION BOX DETAIL

DESIGN APPROVED <i>Shafiq H. Hasan</i>		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>BRIDGE GROUP STRUCTURE DETAIL</b>	
APPROVED FOR DISTRIBUTION <i>Taron A. Nehme</i>		BARRIER JUNCTION BOX	
ROUTE	PROJECT NO.	FA NO.	DRAWING NO. SD 1.11
LOCATION			SHEET NO. OF