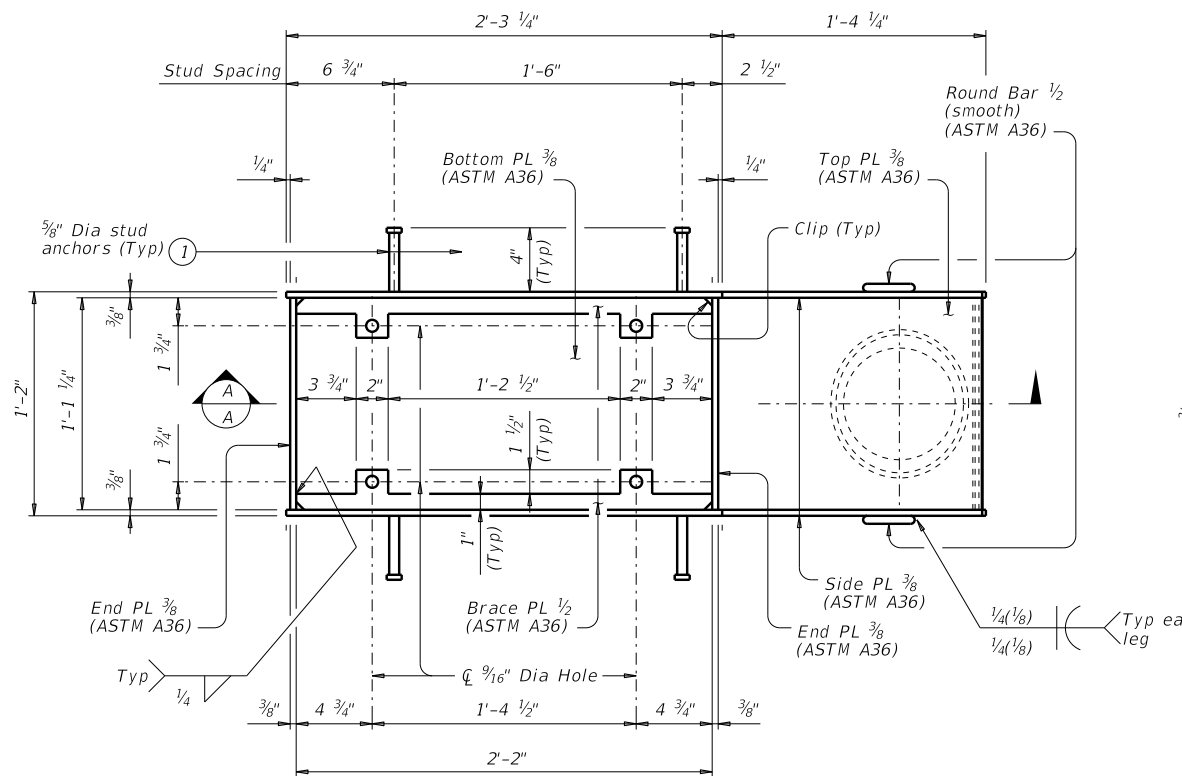


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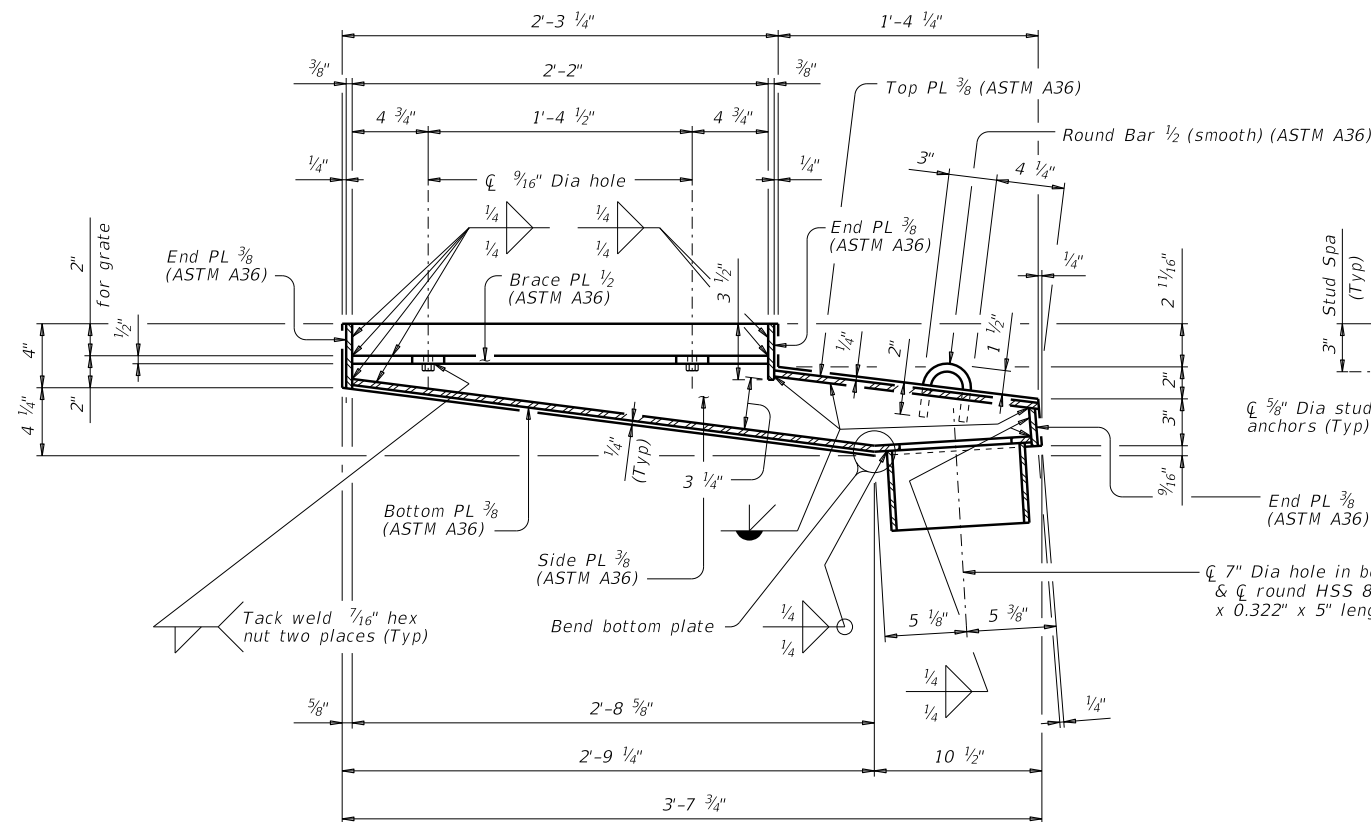
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PLAN

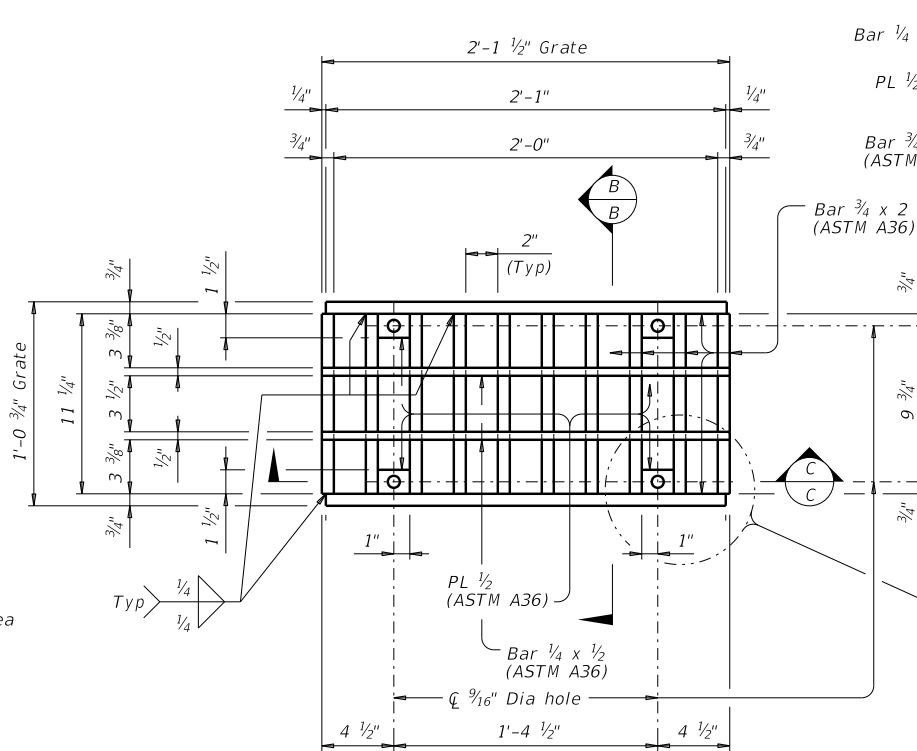
(Grate not shown for clarity)

① Electric arc end-weld stud anchors to plates with complete fusion.

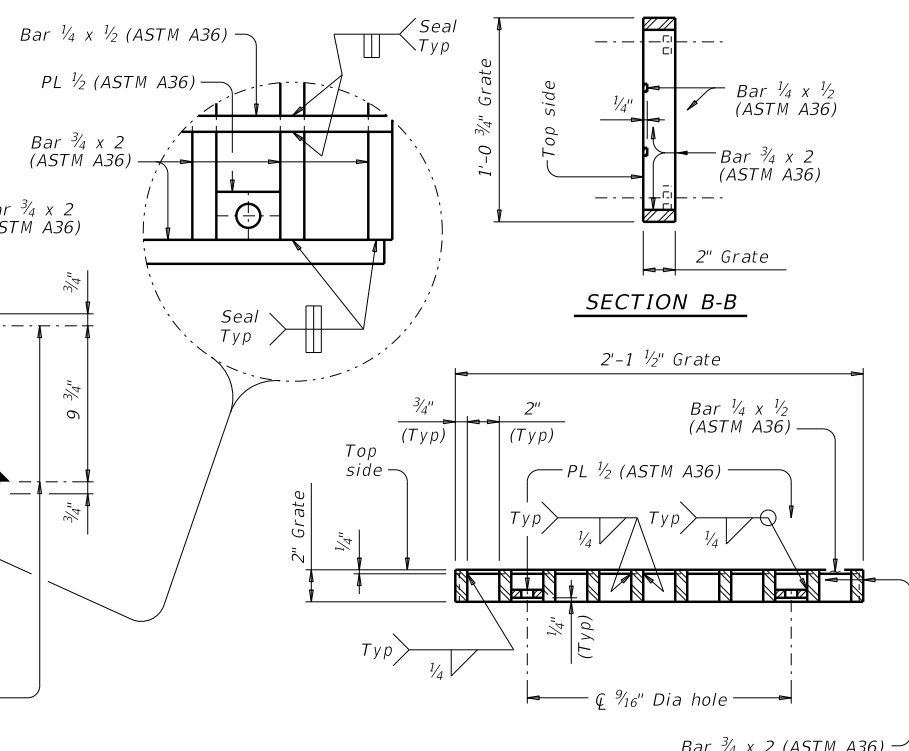


SECTION A-A

(Grate and studs not shown for clarity)



PLAN



SECTION C-C

GRATE DETAILS

This sheet is intended for use as a guide for fabricating and installing bridge deck drains in prestressed concrete girder and simply supported steel beam bridge decks. The size of this drain makes it undesirable for use in negative moment regions of continuous steel units where slab tensile stresses are high. Appropriate details and notes should be prepared for the specific application based on the information presented herein. This sheet may not be used without modification. The details shown here may need to be amended and/or expanded if the exact conditions are not covered. Special consideration should be given to girder, slab and slab reinforcing configuration with respect to the deck drain. Pipe configuration and support details must be done in accordance with manufacturer's recommendations, and drain outfall at the base of the column constructed in such a manner as to disrupt the cap and column reinforcing steel as little as possible. In all cases, details and notes not required must be crossed out or eliminated, "(MOD)" added to the title block, this note and the phrase "(Not to be used as a standard)" removed, and the sheet sealed and signed by a licensed professional engineer.

END VIEW OF DRAIN

HL93 LOADING

SHEET 1 OF 2



Texas Department of Transportation

Bridge
Division
Standard

BRIDGE DRAIN DETAILS (WELDED OR CAST)

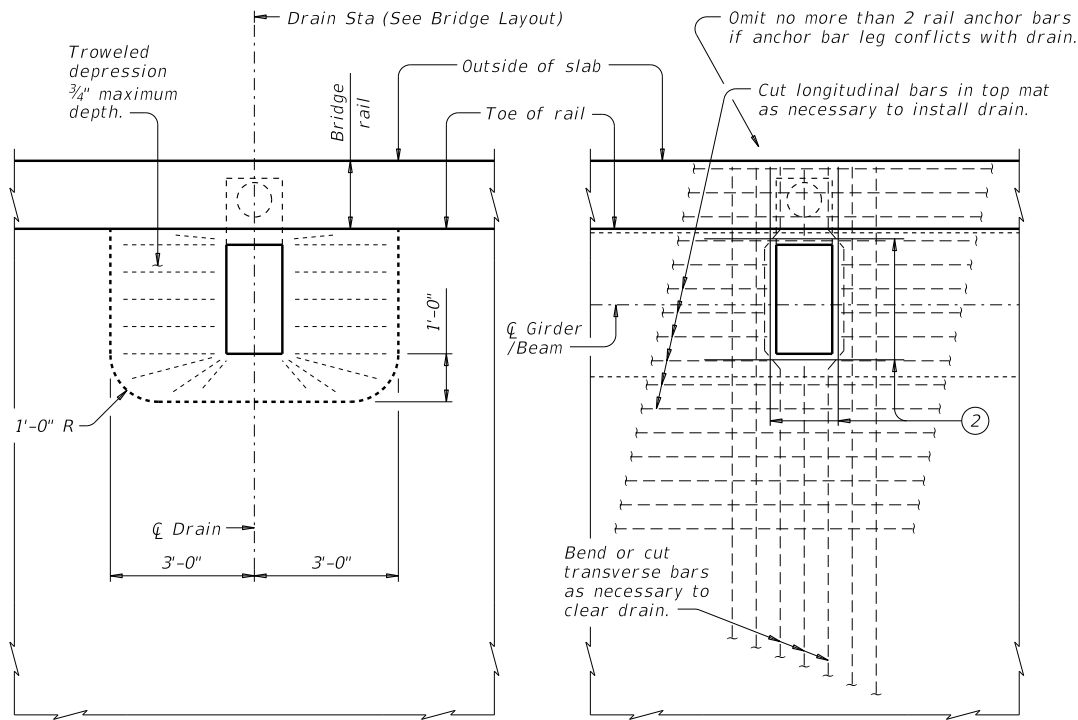
(Not to be used as a standard)

BD-3

FILE: CD-BD3-20.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TAR
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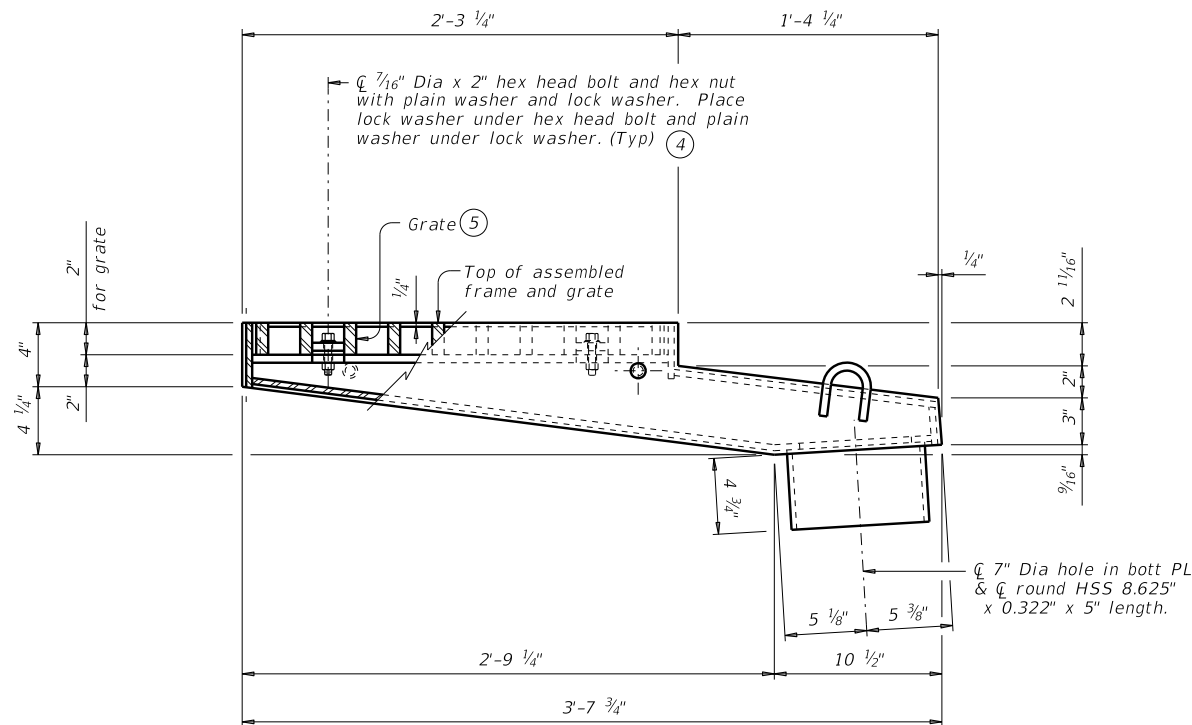
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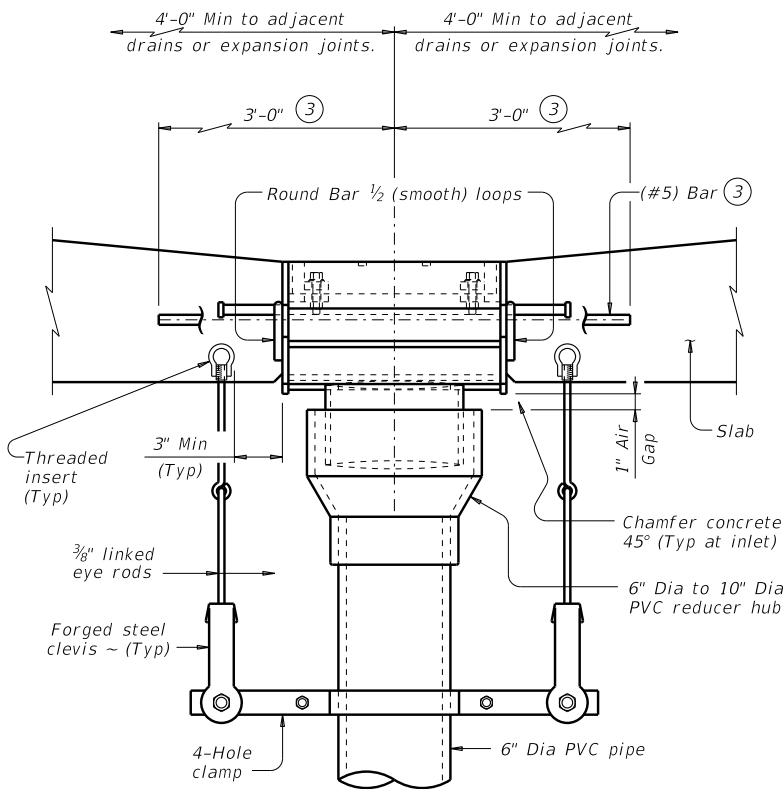
TROWELED DEPRESSION

SHOWING TYPICAL SLAB REINFORCING

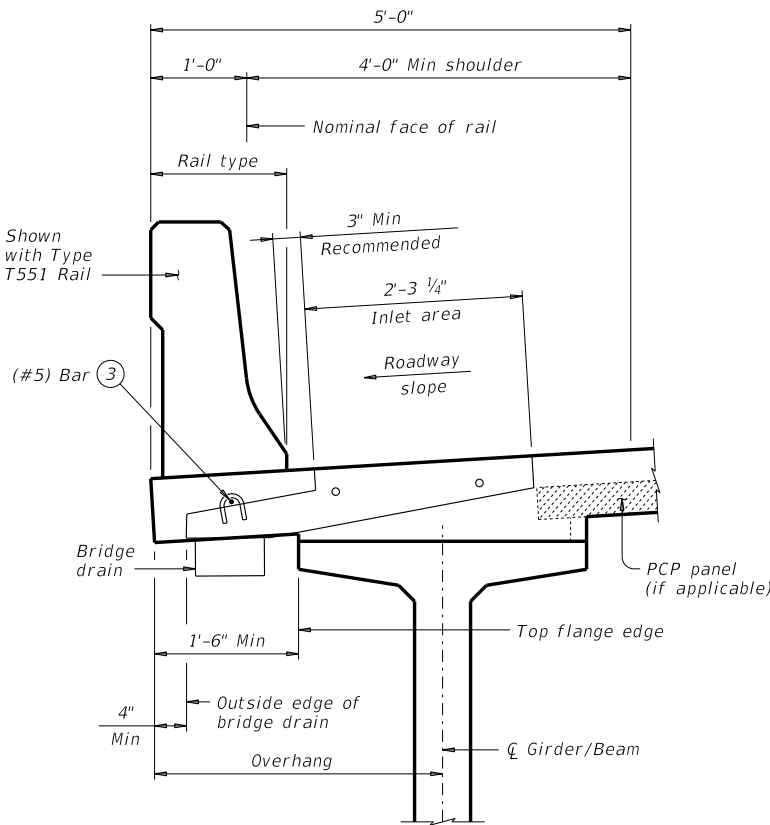
Showing top reinforcing only, bottom reinforcing not shown for clarity.



SIDE VIEW OF ASSEMBLED FRAME AND GRATE



HOOK-UP TO INLET WITH VERTICAL PIPE SUPPORT



EXAMPLE OF INLET ON BRIDGE DECK

Shown without troweled depression. With troweled depression similar.

- 2 Provide 4 additional (#5) bars around perimeter in top mat of reinforcing and 4 additional (#5) bars around perimeter in bottom mat of reinforcing. Extend bars 1'-6" from edges of drain.
- 3 Place one 6'-0" long (#5) bar threaded thru loops on round bar 1/2 (smooth), centered with drain. Contractor must provide 6'-0" long (#5) bar for each drain.
- 4 After nuts have been tack welded to the frame, test the assembly for fit of frame and grate with hex bolt assembly.
- 5 During fabrication, test fit grate to ensure grate can be rotated in either direction of 180° to accommodate assembly in the field.

WELDED BRIDGE DRAIN NOTES:

Galvanize all steel components in accordance with Item 445 "Galvanizing" unless noted otherwise. Round or chamfer exposed edges of Grate and Frame to approximately 1/16" by grinding, unless otherwise noted.
Provide 7/16" Dia x 2" ASTM A307 Grade A hex head bolt with one hex nut, one plain washer and one lock washer, each.
Approximate drain opening area = 173 sq in.

CAST BRIDGE DRAIN NOTES:

During fabrication, test fit grate to ensure grate can be rotated in either direction of 180° to accommodate assembly in the field.
Provide iron castings conforming to Item 471, "Frames, Grates, Rings, and Covers." Take care to ensure uniform bearing between contact surface of grate and frame. Irregularities may be removed by grinding. Provide 3° minimum drafts.
All fillets 1/8" radius unless otherwise shown.
Alternate cast bridge drains may be substituted for the bridge drain shown on this sheet provided they are approved by the Engineer prior to fabrication and installation. Alternate drains must have an approximately equal grate opening area and an 8" diameter outfall. Grate should be of a similar configuration.

Approved manufacturer, Neenah Foundry Company. Product R-3941 (TxDOT BD-3) with an opening area of 183 sq in.
Provide frame material with ASTM A48, Class 35-B gray iron. Provide grate material with ASTM A536, Grade 65-45-12 ductile iron. Galvanization of these materials will not be required.
Provide 3/8" Dia x 1 3/4" stainless steel ASTM F593 hex head bolts for grate with one stainless steel narrow washer, each.
Provide 3/8" Dia x 4 1/2" stainless steel ASTM F593 hex head bolts in lieu of 5/8" Dia electric arc end-weld stud anchors. 3/8" Dia x 4 1/2" stainless steel hex head bolts thread in approximate location into iron frame as shown on welded drain.

Approved manufacturer, East Jordan Iron Works, Inc. Product EJ-5837 (TxDOT BD-3) with an opening area of 173 sq in.
Provide frame material with ASTM A48, Class 35-B gray iron. Provide grate material with ASTM A536, Grade 70-50-05 ductile iron. Galvanization of these materials will not be required.
Provide 7/16" Dia x 3" stainless steel ASTM F593 hex head bolt for grate with one stainless steel narrow washer, each.

GENERAL NOTES:

These drain details are intended for I-Girders and U-Beams with drain outfall on bridge exterior. Bend slab reinforcing bars to clear drain by 1". When bending is not possible reinforcing bars may be stopped or cut to clear drain as shown. Additional slab reinforcing is considered subsidiary to "Reinforced Concrete Slab." When placing concrete, take care to prevent honeycombing or air pockets around and beneath the drain.
Provide Schedule 40 DWV PVC pipe conforming to ASTM D2665. Minimum wall thickness: 0.280" ~ 6" Dia, 0.322" ~ 8" Dia. Use fittings as directed by the Engineer. Attach pipe securely to the superstructure. Provide pipe and supports that accommodate anticipated longitudinal movements of pipe and bridge slab. For long pipe runs, match pipe grade to roadway grade. Galvanize metallic pipe support hardware and fasteners in accordance with Item 445 "Galvanizing." Include the cost of attachment devices in the unit price bid for "Grate and Frame."
Payment will be by the each complete Grate and Frame (Bridge Drain).
See Bridge Layout for location of drains.
Deviation from these details is not permitted without prior approval from the Engineer.
Average weight of Grate and Frame: 240 Lb total
73 Lb (Grate)
167 Lb (Frame).

**BRIDGE DRAIN DETAILS
(WELDED OR CAST)**

(Not to be used as a standard)
BD-3

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