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If prestressed concrete panels are permitted, they shall be placed 3' Min from edges of casting. This portion of cast-in-place slab shall be conventionally reinforced as detailed on the Span or Unit sheets and as directed by the Engineer.

GENERAL NOTES:

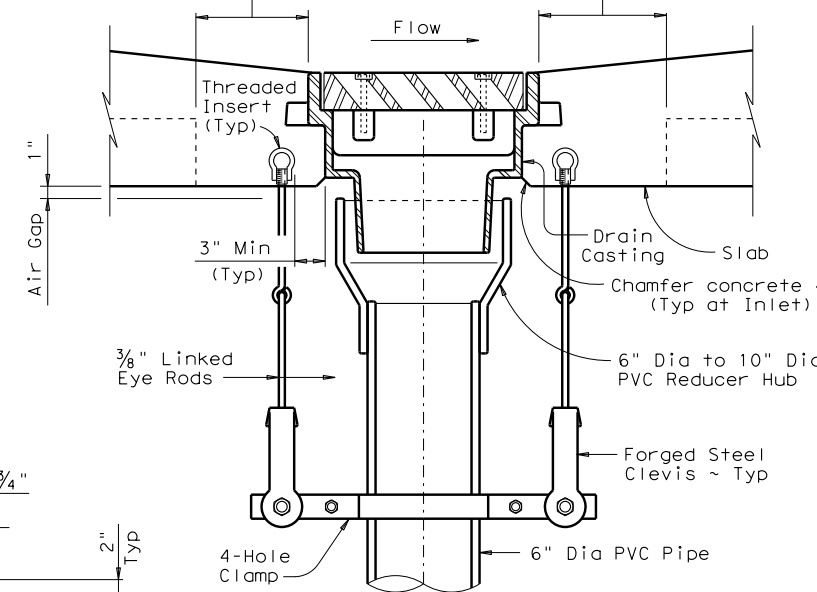
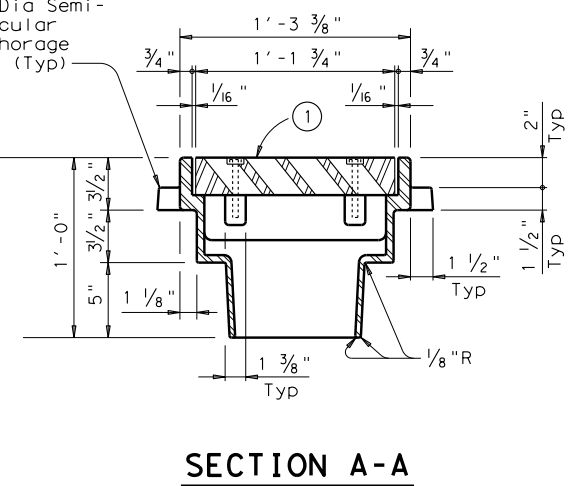
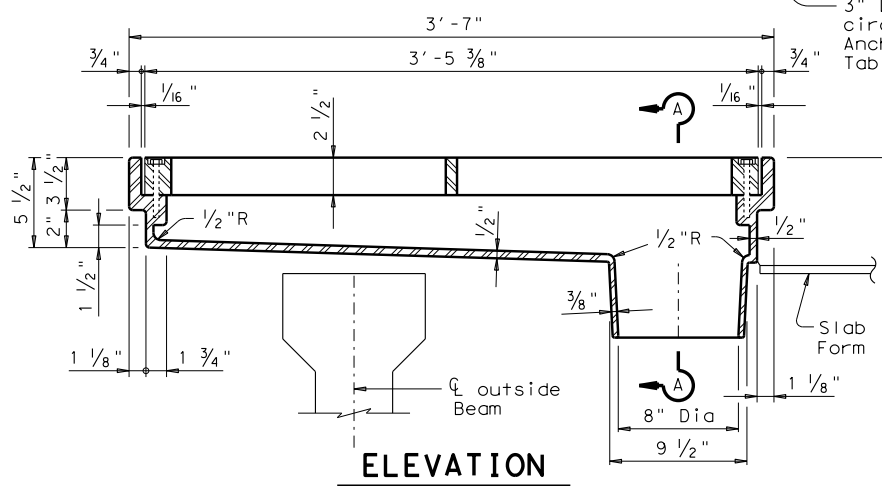
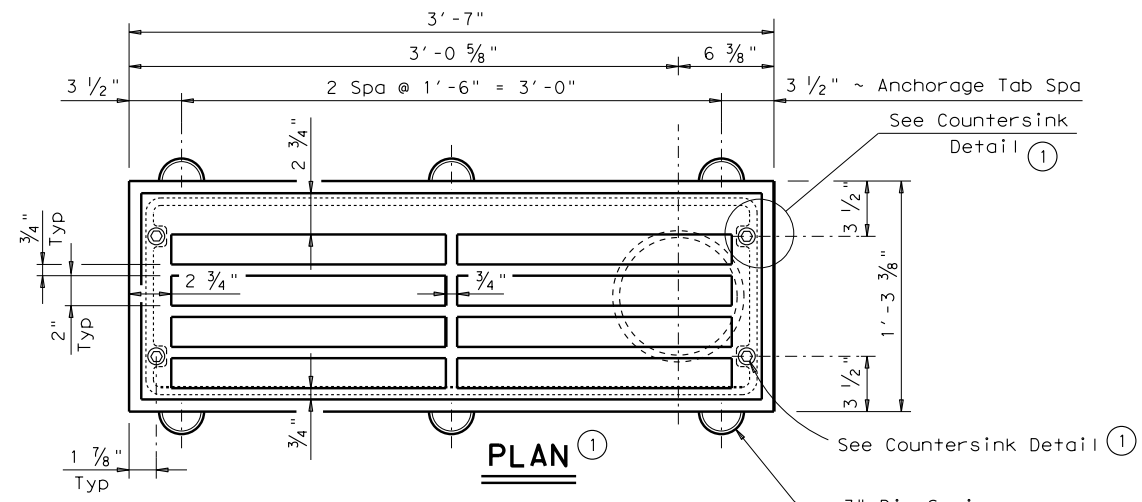
The cast steel Bridge Drain frame and grate detailed herein shall conform to Item 471 and ASTM A 27 Grade 65-35. Care shall be taken to ensure uniform bearing between contact surfaces of grate and frame. Grate must be test fitted at the fabricator for installation of the grate in either orientation to accommodate water flow from either direction across the grate. Irregularities may be removed by grinding. Frame and grate shall be galvanized in accordance with Item 445 after all fabrication and adjustments. All drafts 3°. All fillets 1/4" radius unless otherwise shown.

Alternate 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 (300 sq in) and an 8" diameter outfall. The grate should be of a similar configuration with vanes oriented perpendicular to the direction of traffic and angled toward the flow direction of the storm water. Acceptable materials for cast alternate bridge drains are either ASTM A 48, Class 35 B gray iron or ASTM A 536 Grade 65-45-12 ductile iron. Galvanization of these materials will not be required. Slab reinforcing bars shall be bent to clear casting by 1". When bending is not possible reinforcing bars may be stopped or cut to clear casting as shown. Additional slab reinforcing shall be subsidiary to "Reinforced Concrete Slab". When placing concrete, care shall be taken to prevent honeycombing or air pockets around or beneath the casting.

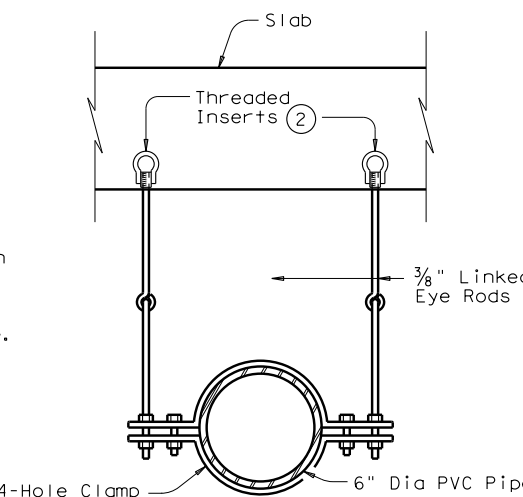
All PVC pipe shall be Schedule 40 DWV conforming to ASTM D 2665. Minimum wall thickness: 0.280" ~ 6" Dia, 0.322" ~ 8" Dia. Fittings to be used as directed by the Engineer. All pipe shall be securely supported by the superstructure. Pipe and supports shall accommodate anticipated longitudinal movements of pipe and bridge slab. For long pipe runs, pipe grade shall match roadway grade. All metallic pipe support hardware and fasteners shall be galvanized in accordance with Item 445. All attachment devices shall be considered subsidiary to the bid item "Grate and Frame".

Payment will be by each Grate & Frame (Bridge Drain). See Bridge Layout for location of drains. Deviations from Bridge Drain Details contained herein will not be permitted without prior approval from the Engineer.

This sheet is intended for use as a guide for fabricating and installing bridge deck drains in prestressed concrete beam 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 beam, slab and slab reinforcing configuration with respect to the deck drain. Pipe configuration and support details must be done in accordance with manufacturers recommendations, and drain outfall at the base of the column accomplished 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, the phrase "(Not to be used as a standard)" removed, and the sheet sealed and signed by a licensed professional engineer.



HOOK-UP TO INLET WITH VERTICAL PIPE SUPPORT

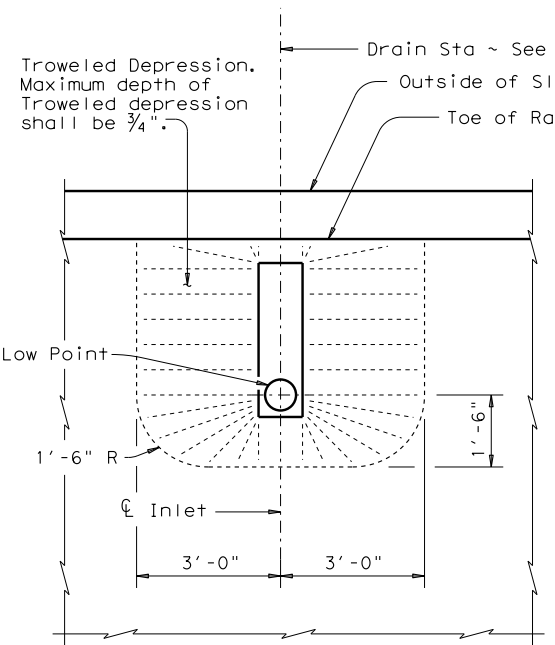


HORIZONTAL PIPE SUPPORT

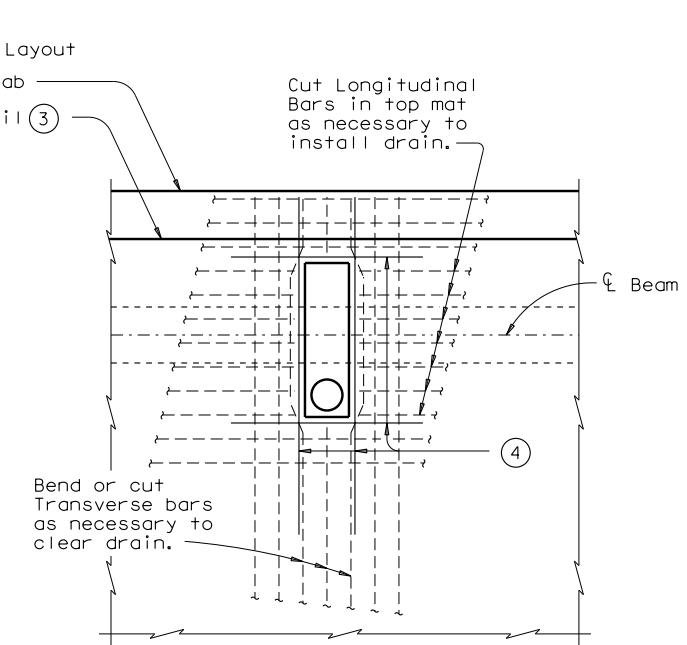
(Spaced 1'-0" from center of Drain then 4'-0" Max spacing for PVC pipe)

- 1 Grate must be test fitted at the Fabricator to ensure grate can be rotated 180° to accommodate water flow from either direction.
- 2 If Prestressed Concrete Panels are permitted, a 1/16" hole shall be drilled or cored (percussion or star drilling shall not be permitted) thru the panels, the 3/8" Linked Eye Rods inserted through the panels and the threaded insert placed in the cast-in-place portion of the bridge slab above the panels.
- 3 Edge of Bridge Drain shall be placed close to the toe of rail and all plumbing shall be placed behind outside beam and inside Interior Bents and Abutments as practicable to hide from view.

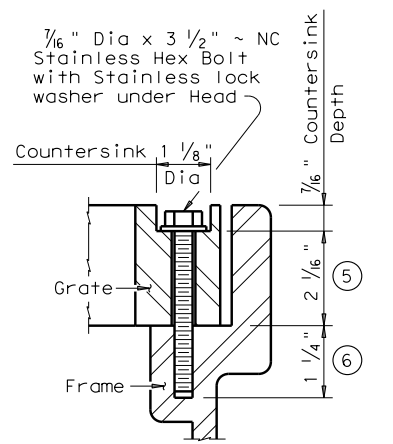
- 4 Provide 4 additional #5 bars around perimeter in top mat of reinforcing and 4 additional #5 bars around perimeter in bottom mat of reinforcing. Extend bars 1'-6" from edges of drain.
- 5 Provide 1/2" Dia hole for Bolt thru grate.
- 6 Provide 1/16" ~ 14 NC threaded hole in frame ~ Depth of Hole = 1 1/4".



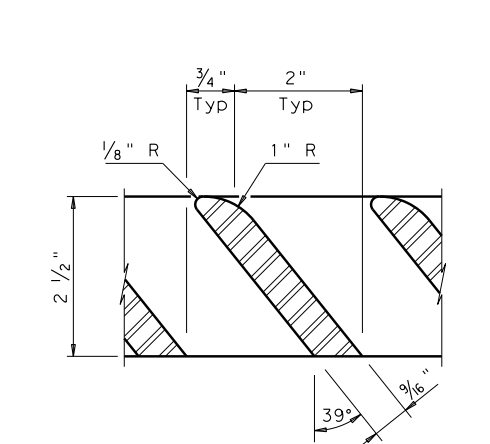
TROWELED DEPRESSION



SHOWING TYPICAL SLAB REINFORCING



COUNTERSINK DETAIL



GRATE VANE DETAIL

HL93 LOADING

Texas Department of Transportation

BRIDGE DRAIN DETAILS (CAST)

(NOT TO BE USED AS A STANDARD)

BD-1

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