

**GENERAL NOTES**

PRECAST BOX CULVERTS  
IF PRECAST BOX CULVERTS ARE SPECIFIED, THEY SHALL BE CONSTRUCTED AT THE LOCATIONS SHOWN IN THE PLANS ACCORDING TO THE REQUIREMENTS SHOWN ON THIS SHEET. WHEN APPROVED BY THE ENGINEER, PRECAST BOX CULVERTS MAY BE CONSTRUCTED IN LIEU OF CAST-IN-PLACE BOX CULVERTS. WHEN THE PRECAST OPTION IS CHOSEN BY THE CONTRACTOR, THE CAST-IN-PLACE QUANTITIES SHALL BE USED AS THE BASIS OF PAYMENT WHICH SHALL INCLUDE LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION.

UNLESS OTHERWISE APPROVED BY THE ENGINEER, CAST-IN-PLACE COLLARS SHALL BE REQUIRED AT HORIZONTAL AND VERTICAL CHANGES IN RCB ALIGNMENT. CAST-IN-PLACE END SECTIONS AND WINGWALLS ARE REQUIRED EXCEPT AS NOTED ON THIS SHEET. CAST-IN-PLACE SECTIONS MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER AT JUNCTIONS OF DRAINAGE STRUCTURES.

CAST-IN-PLACE CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH THE KDOT SPECIFICATIONS AND KDOT'S "GUIDELINES FOR STRUCTURAL DESIGN AND DETAIL OF REINFORCED CONCRETE BOX CULVERTS". CONCRETE GRADE 4.0 AND GRADE 60 REINFORCING STEEL SHALL BE USED FOR THE CAST-IN-PLACE CONSTRUCTION.

SPECIFICATIONS  
SINGLE-CELL PRECAST CONCRETE BOX CULVERTS SHALL CONFORM TO THE REQUIREMENTS OF THE FOLLOWING SPECIFICATIONS EXCEPT AS NOTED IN THE KDOT SPECIFICATIONS. MULTIPLE-CELL PRECAST BOXES SHALL BE DESIGNED IN ACCORDANCE WITH THE CRITERIA USED TO DEVELOP THE SINGLE-CELL PRECAST BOXES (SEE THE LATEST ASTM A615 & ASTM C1577 SPECIFICATIONS).

FABRICATIONS  
PRIOR TO FABRICATION, THE CONTRACTOR SHALL FURNISH SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL DETAIL ALL PHASES OF CONSTRUCTION INCLUDING LAYOUT, JOINT DETAILS, LIFTING DEVICES, CASTING METHODS, CONSTRUCTION PLACEMENT AND DETAILS OF ANY CAST-IN-PLACE SEGMENTS OR TRANSITIONS THAT MAY BE REQUIRED. COPIES OF OVERHEIGHT AND OVERLOAD PERMITS, WHEN REQUIRED SHALL BE SUBMITTED WITH THE SHOP DRAWINGS.

PRECAST CONCRETE BOX CULVERT SHALL BE LAID WITH THE GROOVE END OF EACH SECTION UPSTREAM, AND THE SECTIONS SHALL BE TIGHTLY JOINED. JOINT SHALL BE SEALED WITH AN APPROVED BITUMINOUS MASTIC MATERIAL AND GEOTEXTILE OR SEALING BOND OR AN EXTRUDED RUBBER GASKET, INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER. LIFTING HOLES SHALL BE PLUGGED WITH A PRECAST PLUG, SEALED AND COVERED WITH MASTIC OR MORTAR.

THE FOLLOWING INFORMATION SHALL BE LEGIBLY MARKED ON AN INSIDE FACE OF EACH BOX SECTION BY WATERPROOF PAINT OR OTHER APPROVED MEANS:

- DATE OF MANUFACTURE
- NAME OR TRADEMARK AND LOCATION OF THE MANUFACTURER
- WEIGHT OF BOX SECTION IN TONS
- PRICE MARK
- THE TOP OF THE BOX

CONSTRUCTION REQUIREMENTS  
FOUNDATION PREPARATION SHALL BE IN ACCORDANCE WITH KDOT SPECIFICATIONS EXCEPT THAT A MINIMUM 6 INCH THICKNESS OF CRUSHED STONE FOR BACKFILL OR 3 INCH SEAL COURSE SHALL BE PROVIDED. CHOICE OF BEDDING SHALL BE AT THE CONTRACTOR'S OPTION AND APPROVED BY THE ENGINEER.

LOADING  
HL-93 AASHTO SPECIFICATIONS, 8TH EDITION.

UNIT STRESSES

CONCRETE GRADE 4.0:  $f_c = 4,000$  PSI

REINFORCING STEEL:  $f_y = 60,000$  PSI

CONCRETE

CONCRETE GRADE 4.0 SHALL BE USED THROUGHOUT.

BEVEL ALL EXPOSED EDGES WITH A 3/4" TRIANGULAR MOULDING.

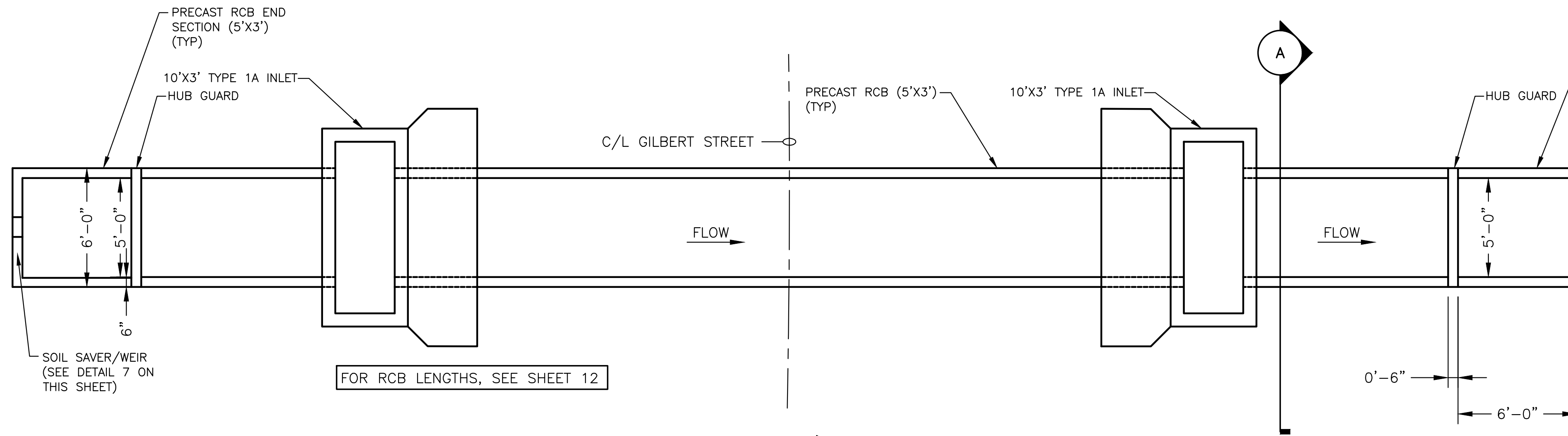
REINFORCING

ALL REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60.

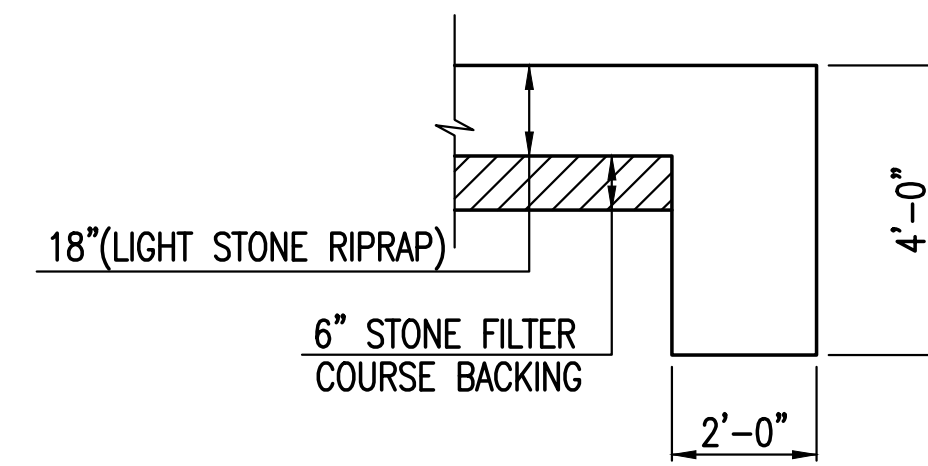
ALL DIMENSIONS RELATIVE TO REINFORCING STEEL SHALL BE TO CENTERLINE OF BAR UNLESS OTHERWISE NOTED.

EXCAVATION

EXCAVATION FOR CULVERT SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO BOX CONSTRUCTION.



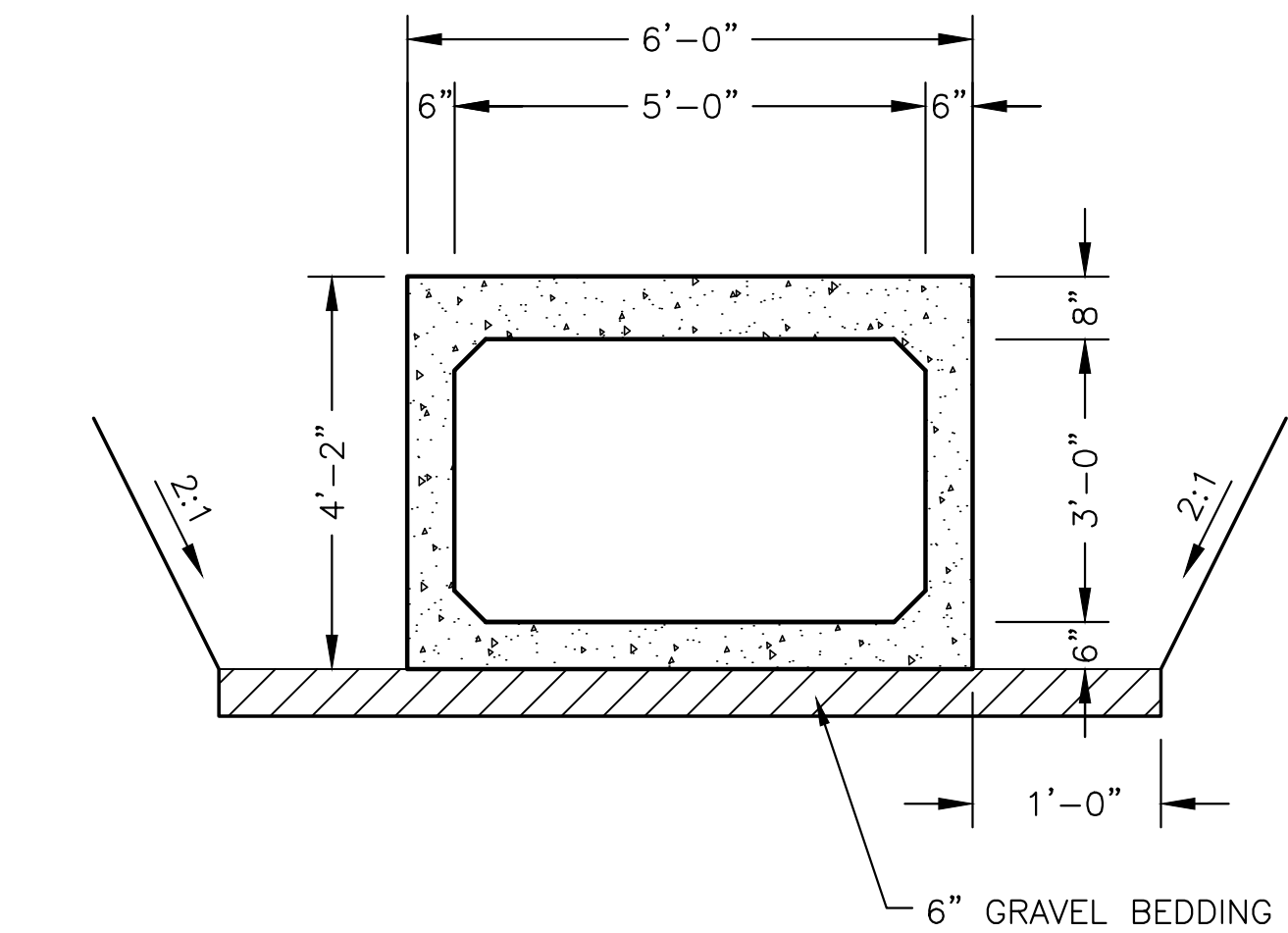
**1 PLAN : RCB**  
1/4" = 1'-0"



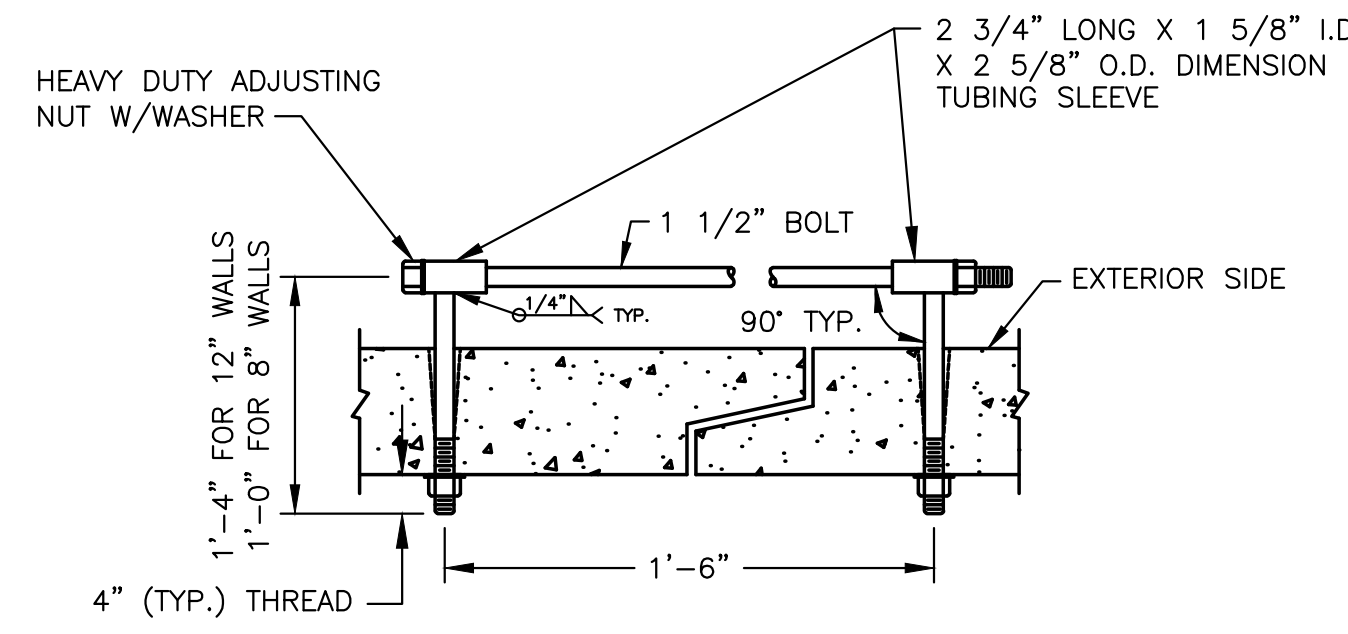
**4 TYPICAL SECTION THRU TOEWALL**  
NO SCALE

NOTES

1. ALL RIPRAP FOR THIS PROJECT SHALL BE NATURAL STONE. NEITHER BROKEN CONCRETE, FABRIC ENVELOPE, NOR PREMIXED DRY PACKAGED CONCRETE BAG ALTERNATES WILL BE ALLOWED, UNLESS INDICATED OTHERWISE.
2. TOEWALLS SHALL BE INSTALLED ALONG ALL UNPROTECTED EDGES OF STONE RIPRAP.
3. GROUTING OF THE SURFACE OF THE RIPRAP SHALL NOT BE PERFORMED, UNLESS INDICATED OTHERWISE. GROUTING OF THE TOEWALLS SHALL BE PERFORMED PER CITY SPECIFICATIONS.



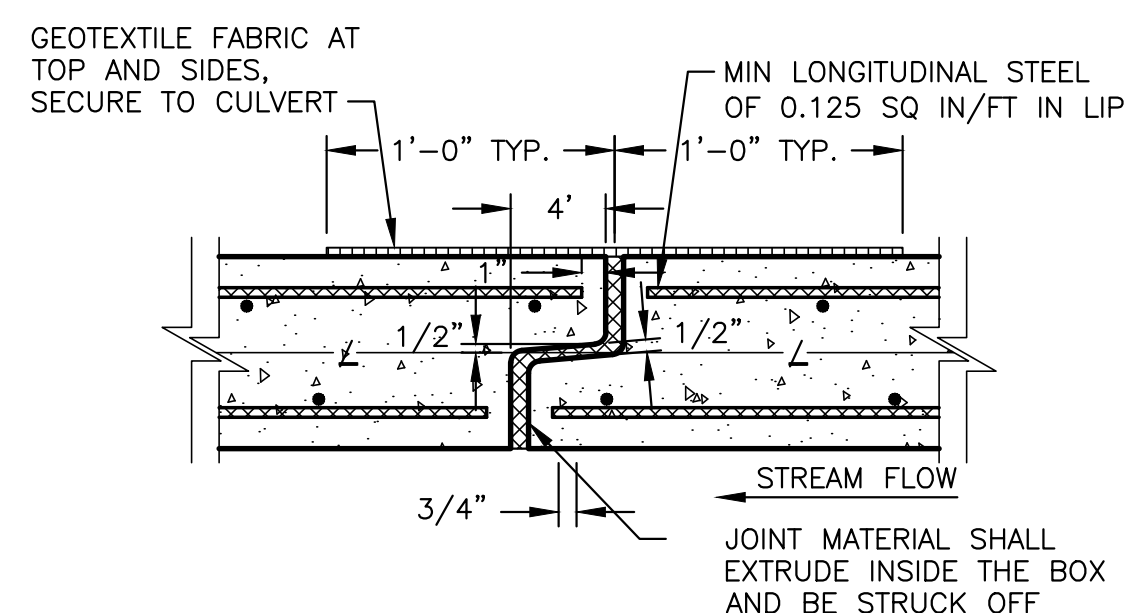
**2 SECTION A TYPICAL PRECAST SECTION**  
1/2" = 1'-0"



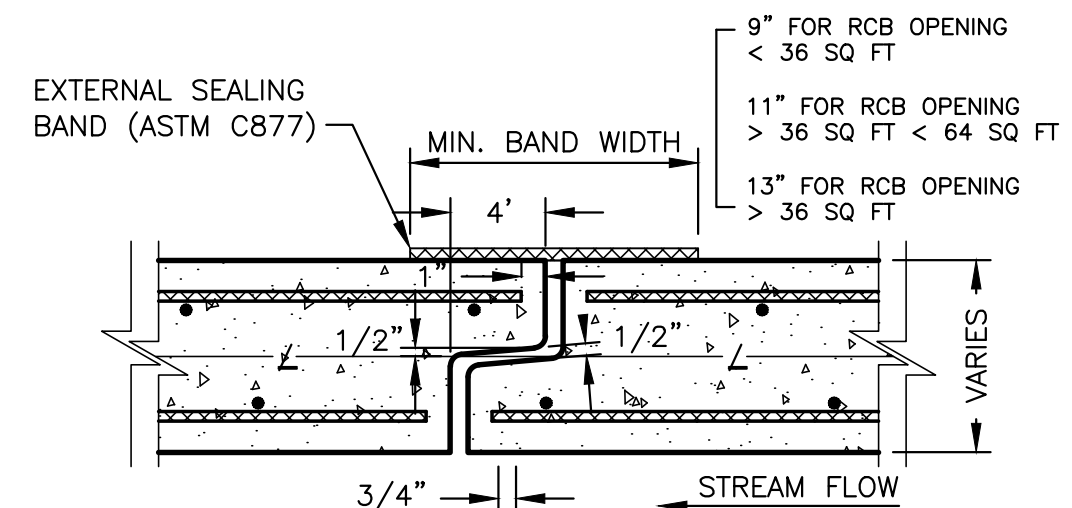
**3 HEAVY DUTY (H.D.) COUPLER**  
NTS

BOLTS TO BE A-36 1 1/2" DIAMETER. BOLTS, NUTS, WASHERS AND SLEEVES TO BE ZINC PLATED. WASHERS TO BE 3 1/2" O.D. X 7 GAUGE. SHIP WITH NUTS AND WASHERS PLACED ON BOLTS. INSTALL 4 COUPLERS PER JOINT, AS SHOWN (TWO ON THE TOP AND 1 ON EACH SIDE).

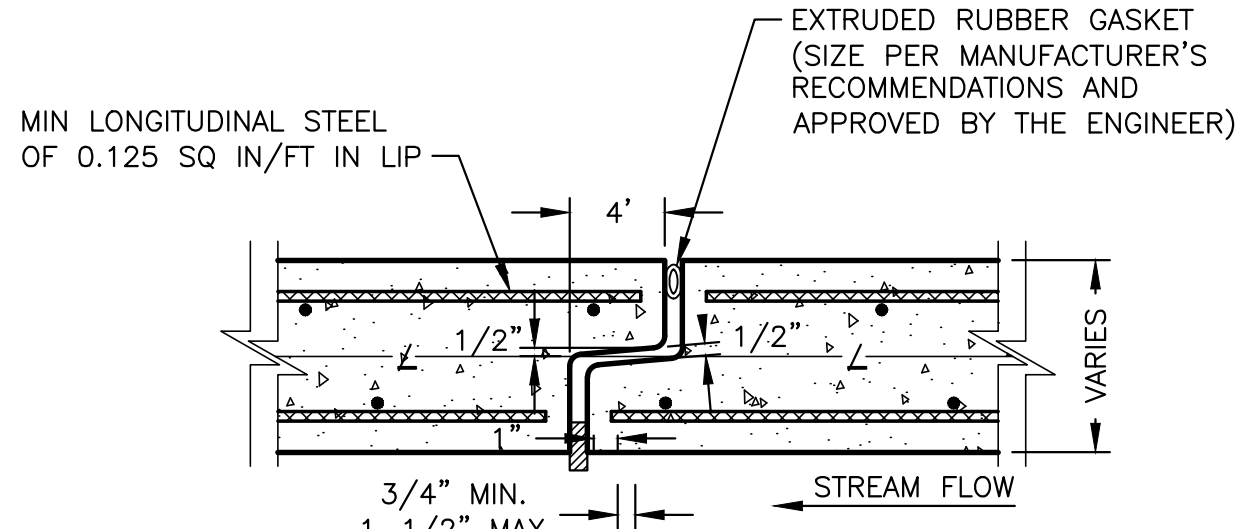
**4 LIGHT STONE RIPRAP DETAILS**  
NTS



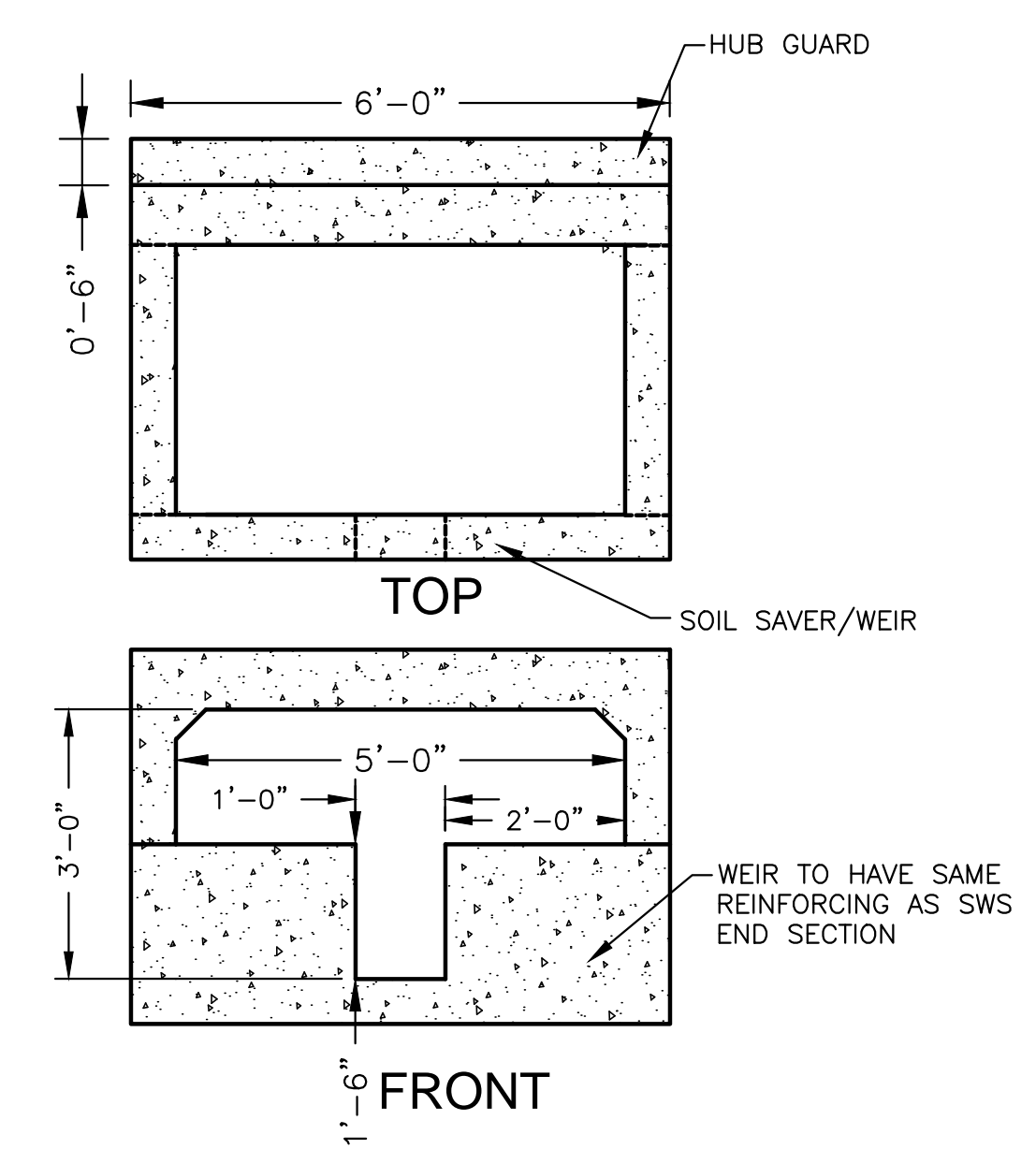
**5 OPTION 'A'**  
1-1/2" = 1'-0"



**6 OPTION 'B'**  
1-1/2" = 1'-0"



**7 OPEN JOINT DETAIL**  
1-1/2" = 1'-0"



**8 SOIL SAVER/WEIR DETAIL (UPSTREAM END)**  
1-1/2" = 1'-0"