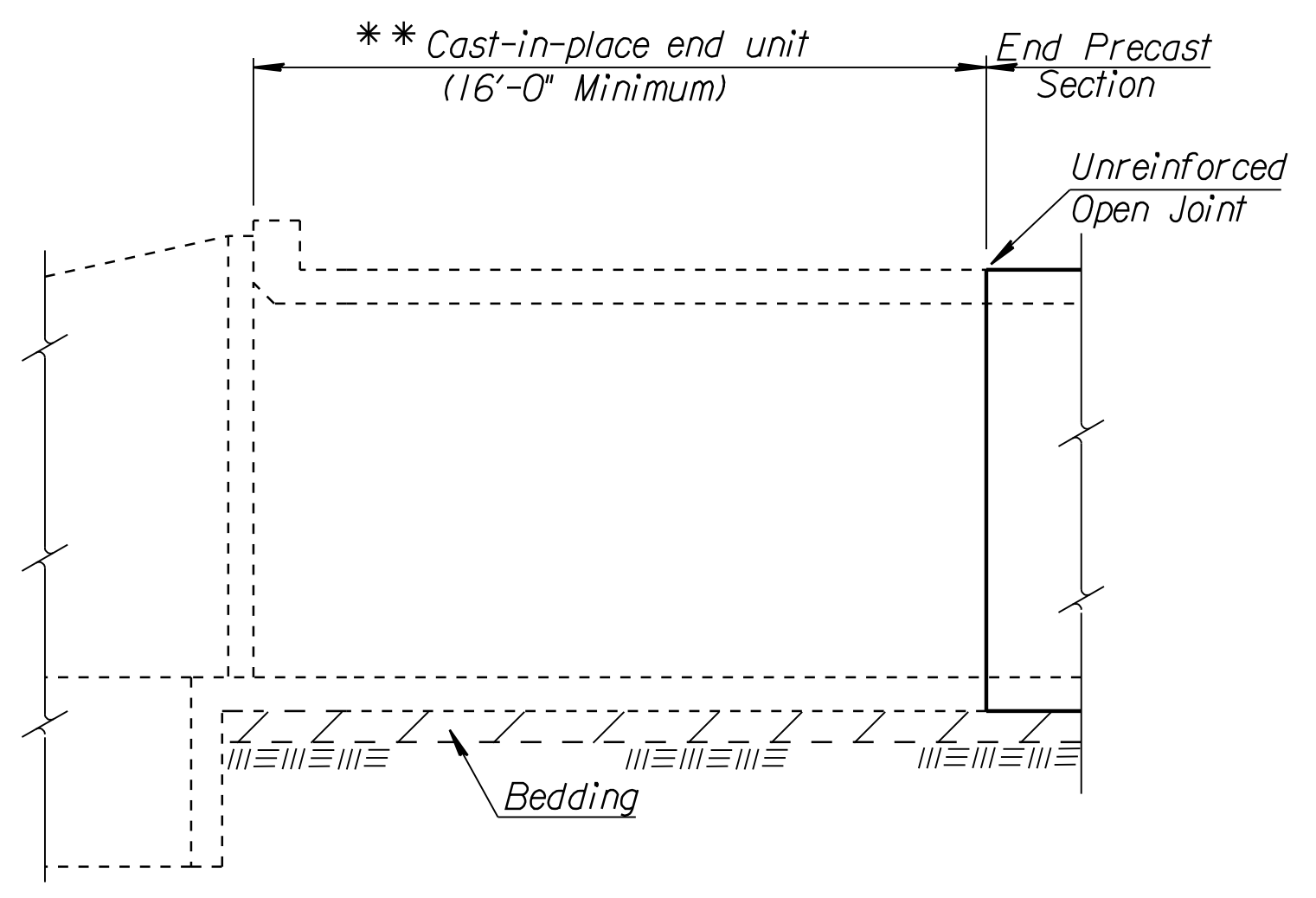


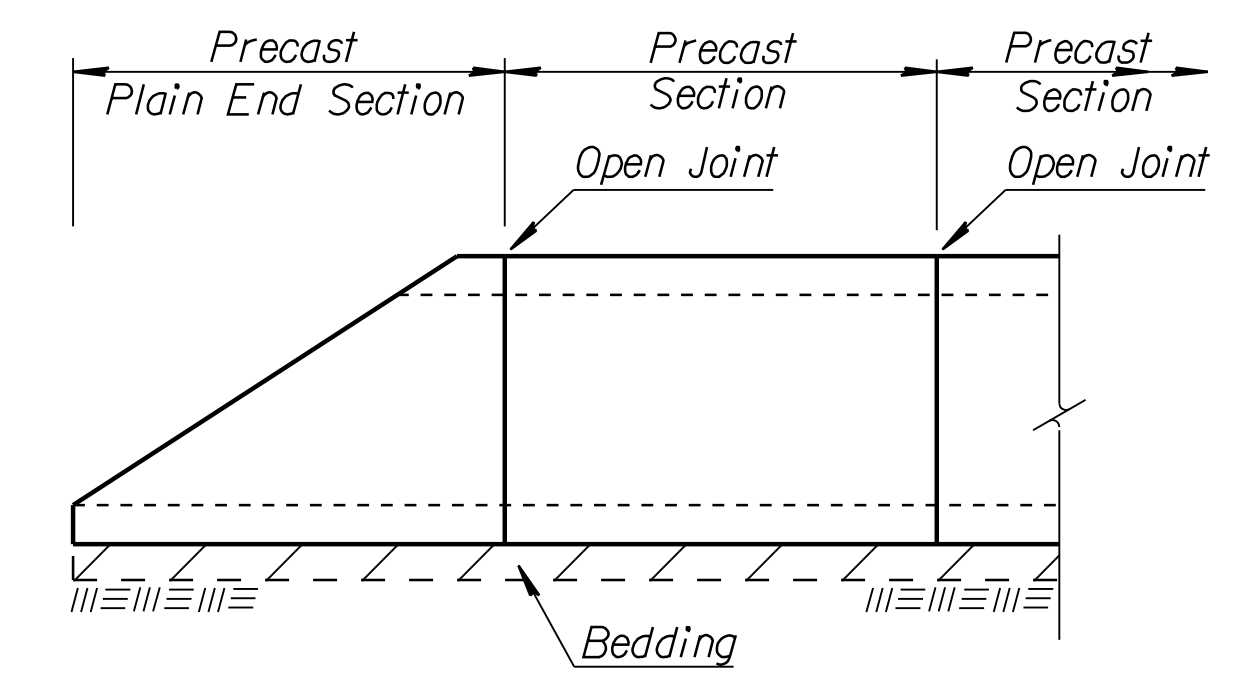
ELEVATION AT HEADWALL

* Minimum barrel length of cast-in-place end unit shall equal the RCB rise or 8'-0", whichever is less. This length can be used when the joint between the cast-in-place end unit and the precast section is reinforced as shown.



ELEVATION AT HEADWALL

** Minimum barrel length of cast-in-place end unit shall be 16'-0" when using an unreinforced open joint at the end of the precast section.



ELEVATION AT PRECAST END SECTION

(Precast End Sections are permitted where straight wings are shown in the plans or at the downstream end for single cell RCB with a rise of six feet or less.)

GENERAL NOTES

PRECAST BOX CULVERTS: If precast boxes are specified, construct them at the locations shown in the plans and according to the requirement shown on this sheet. When approved by the Engineer, precast box culverts may be used in lieu of cast-in-place box culverts. If the Contractor chooses the precast option, use the cast-in-place quantities as the cost basis. This cost includes all labor equipment, material and incidentals necessary to complete the installation.

Unless otherwise approved by the Engineer, use cast-in-place collars at horizontal and vertical changes in RCB alignment. Use cast-in-place end sections and wingwalls except as noted on this sheet. The Engineer may require cast-in-place sections at junctions of drainage structures.

Cast-in-place concrete work shall conform to the requirements of the KDOT Specifications and KDOT's "Guidelines for Structural Design and Detail of Reinforced Concrete Box Culverts". Use Grade 4.0 concrete and Grade 60 reinforcing steel conforming to ASTM A615 for 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. Design multiple-cell precast boxes in accordance with the criteria used to develop the single-cell precast boxes. (See Appendix of ASTM Specification C 1433, Table 2 and the latest AASHTO Specifications.)

DISTRIBUTION SLAB: Fill heights less than 2 feet require a distribution slab. Construct the distribution slab over the width of the exterior walls of the barrel to the outside edges of the roadway shoulders. Terminate the slab a minimum of 2 feet from the edge of a barrel segment.

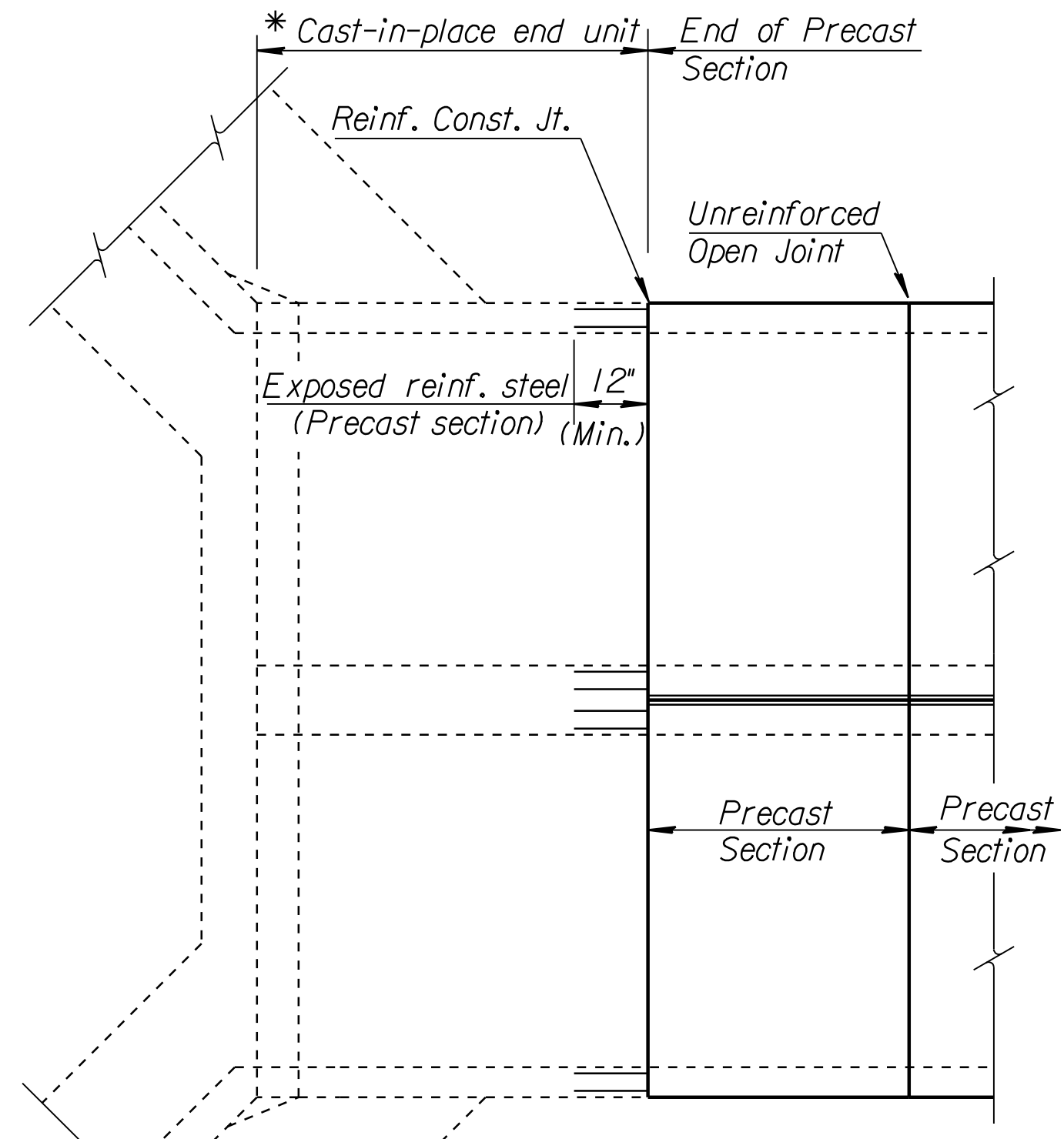
A cast-in-place distribution slab shall be a minimum of 6 inches thick, reinforced with #4 bars at 18 inches transversely and #5 bars at 12 inches along the barrel. Substitution of an equivalent welded wire fabric is acceptable.

Precast distribution slabs with the same thickness and reinforcement as a cast-in-place slab may be used when fill heights exceed 1 foot. Center the joints of the precast distribution slabs over the barrel segments. Provide a minimum of 3 inches of granular material between the barrel and the precast distribution slab.

Options:

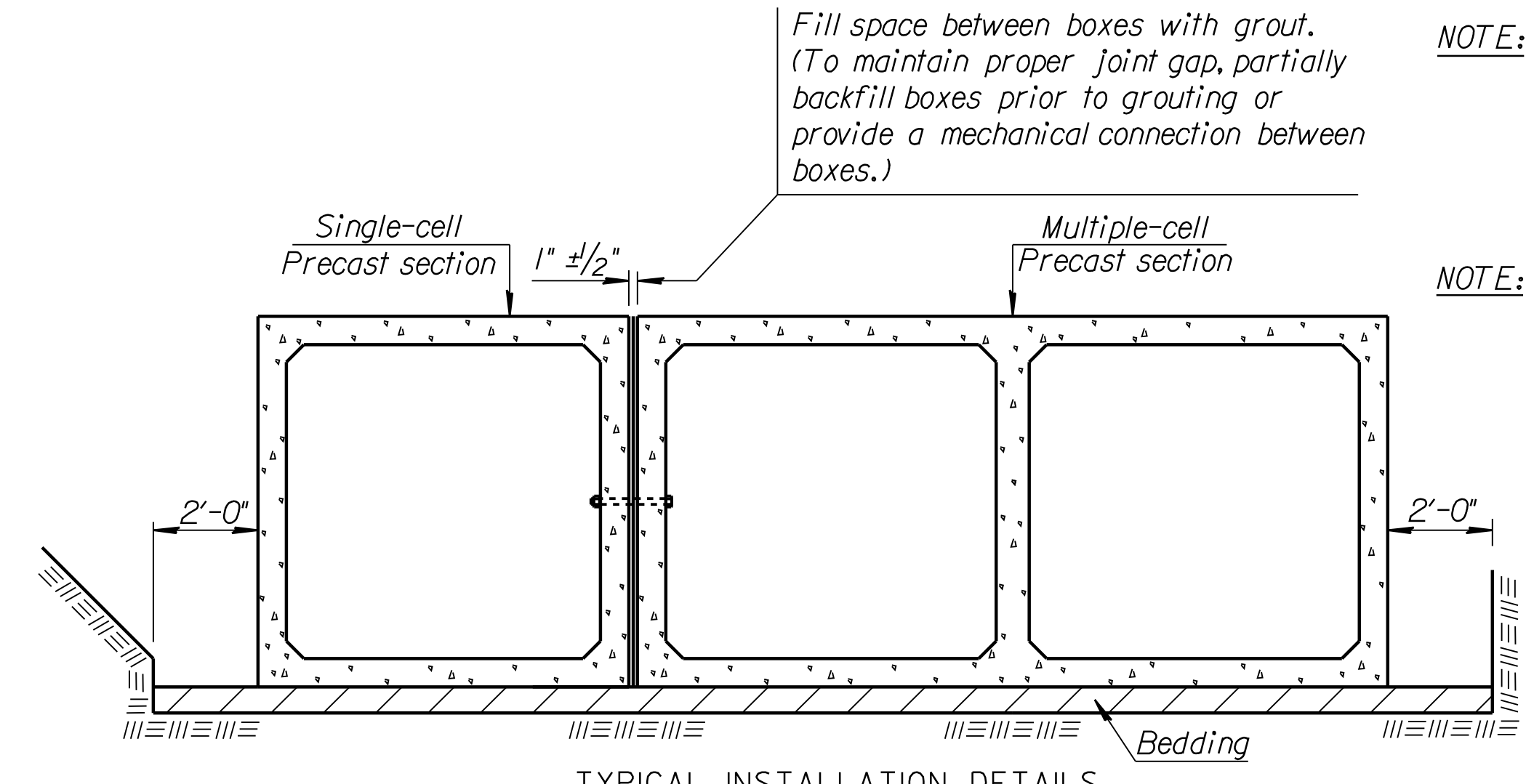
- Reinforced concrete pavement (min. 6 inches thick) will meet the requirements of a distribution slab. Reinforce as noted above. Provide a minimum of 3 inches of granular material between the concrete pavement and the precast boxes.
- Asphalt pavement (min. 6 inches thick) will meet the requirements of a distribution slab. Provide a minimum of 6 inches of granular material between the asphalt and the precast boxes. Also provide a geogrid on top of the granular material.

A special design will be required when the above options are not geometrically possible.



PLAN AT HEADWALL

(Double culvert installation shown)



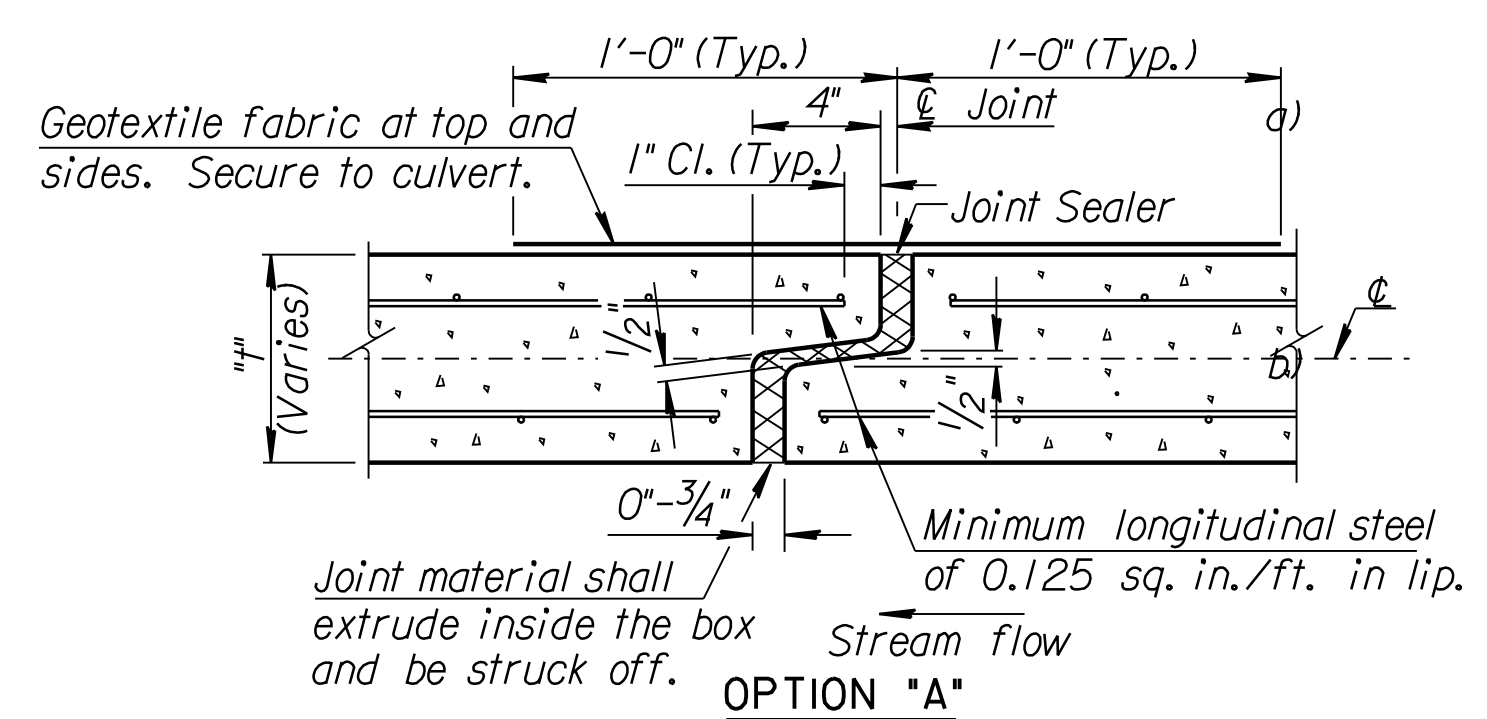
TYPICAL INSTALLATION DETAILS

NOTE: See "Bridge Excavation" sheet, (Std. No. BR100), for excavation details and basis of payment.

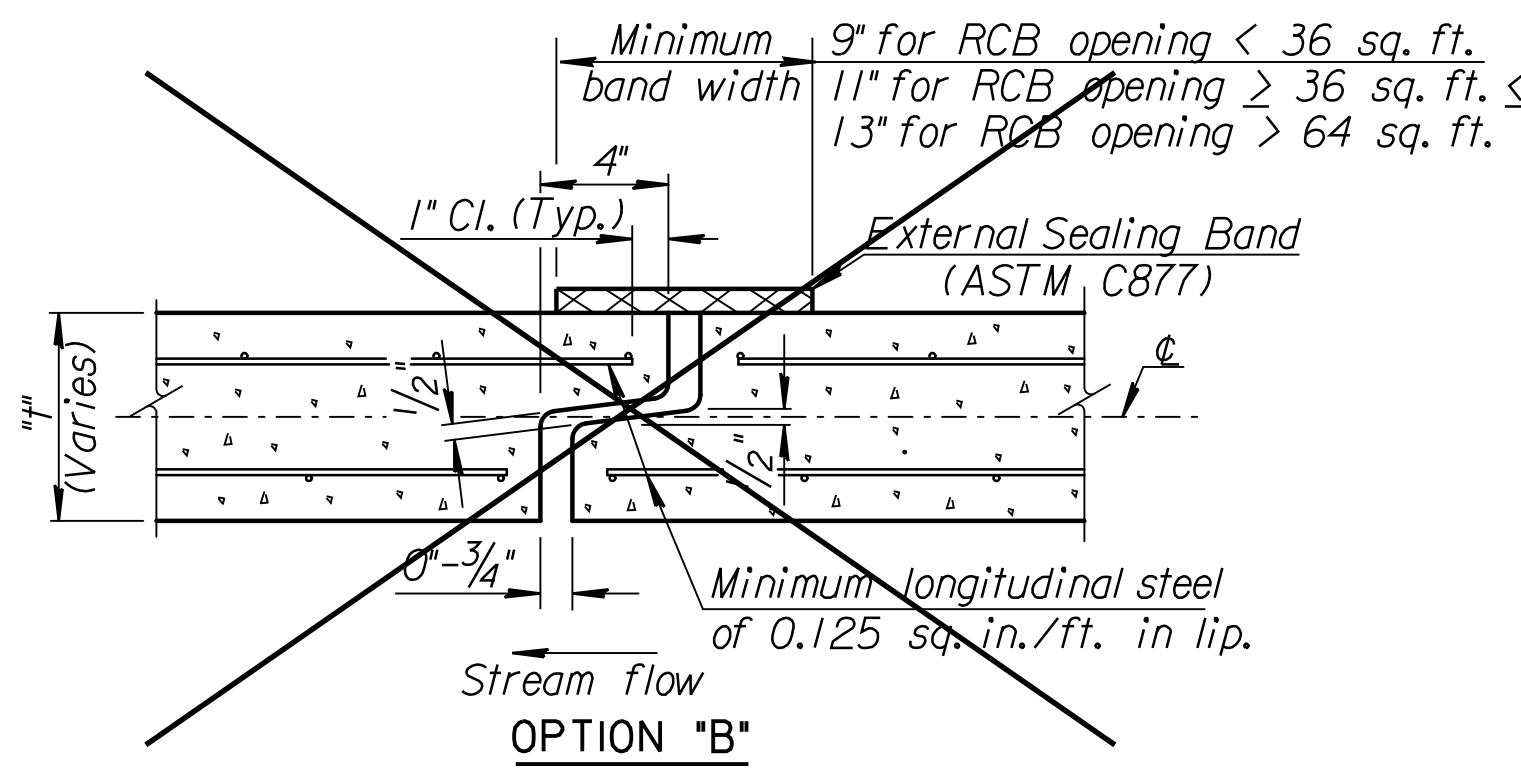
NOTE: Minimum length of precast section shall be 4'-0".

NOTE: A single cell box of equivalent area may be substituted for a double cell box with cell spans less than or equal to 6'-0". Any revision in the cell height from that shown on the plans will not be permitted, unless approved by the Engineer. Two single cell boxes may be substituted for a double cell box, when approved by the Engineer.

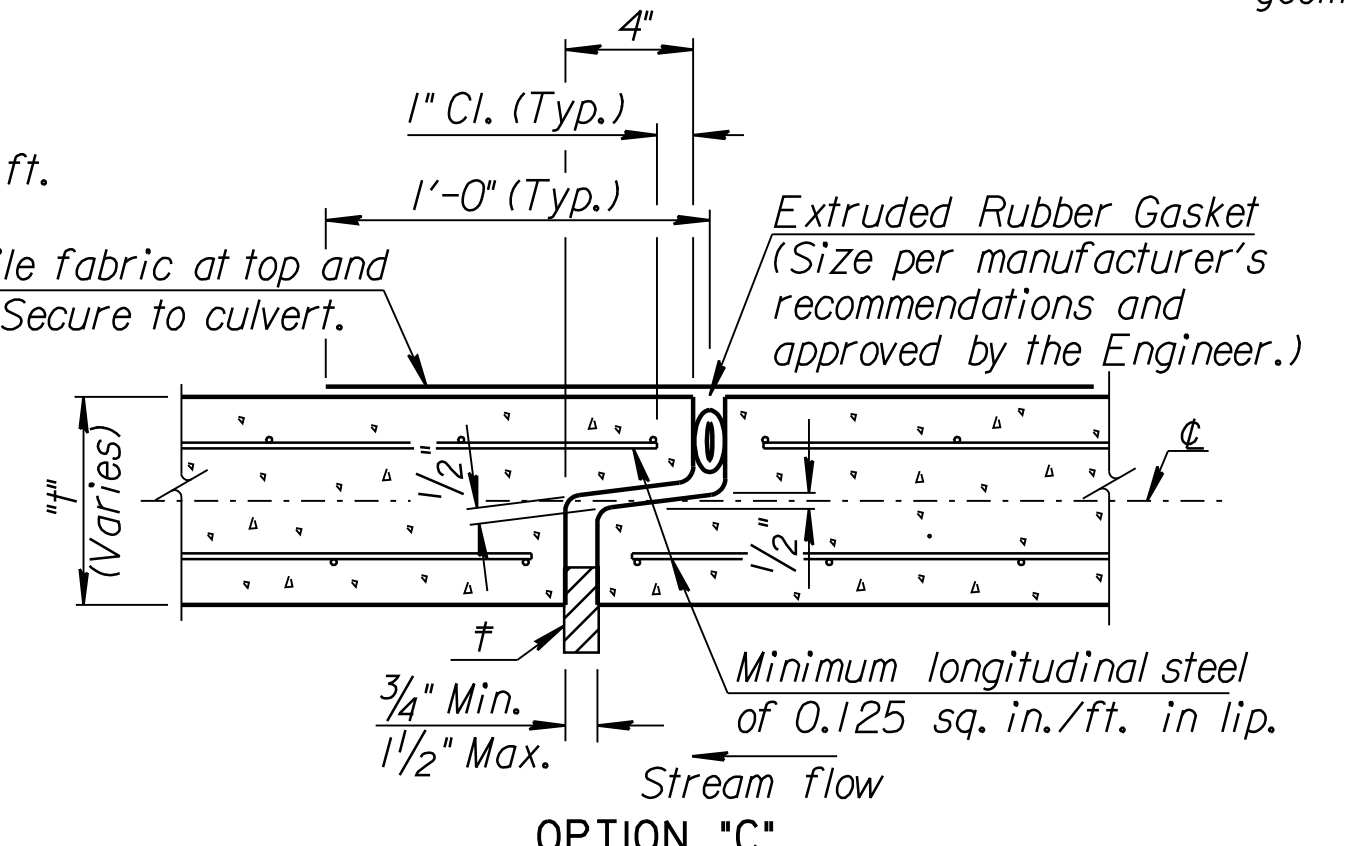
NOTE: See respective RCB Standard Sheets for cast-in-place details.



OPTION "A"



OPTION "B"



OPTION "C"

* Insert temporary, 3/4"-1" wide, hardwood wedges to prevent over-compressing gasket.

Geotextile fabric at top and sides. Secure to culvert. Joint sealer. Joint material shall extrude inside the box and be struck off. Minimum longitudinal steel of 0.125 sq. in./ft. in lip.

Minimum band width: 9" for RCB opening < 36 sq. ft., 11" for RCB opening ≥ 36 sq. ft. ≤ 64 sq. ft., 13" for RCB opening > 64 sq. ft. External Sealing Band (ASTM C877). Geotextile fabric at top and sides. Secure to culvert. Minimum longitudinal steel of 0.125 sq. in./ft. in lip. Stream flow. OPTION "B"

1" Cl. (Typ.) 1'-0" (Typ.) Extruded Rubber Gasket (Size per manufacturer's recommendations and approved by the Engineer.) Minimum longitudinal steel of 0.125 sq. in./ft. in lip. 3/4" Min. 1/2" Max. Stream flow. OPTION "C"

Std. Base File: br031.dgn
 Plotted By: drp
 File: i:\2005\05493-2\Waterman\05493-002-br031\181.dgn
 Plot Date: 2/20/2007

NO.	DATE	REVISIONS	BY	APP'D
6	10-19-04	Concrete - Class to Grade	RAM	KFH
5	07-31-01	Revised Notes	RAM	KFH
4	11-03-00	Revised ASTM / Added Note	RAM	KFH
3	12-20-96	Revised CIP end unit details.	RAM	KFH
2	1-17-95	Revised general notes	LRR	KFH
1	6-22-94	Added option 'C' & revised notes	RAM	KFH

KANSAS DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE BOX CULVERT DETAILS

BR031

DESIGNED	DETAIL CK.	RAM	QUAN. CK.	CADD CK.
DESIGN CK.	DETAIL CK.	RAM	QUAN. CK.	CADD CK.

8-06-01 APP'D KENNETH F. HURST