PRECAST SEGMENT TO SEGMENT TONGUE & GROOVE TRANSVERSE JOINTS

ALTERNATE BOTTOM SLAB TRANSVERSE JOINT
TYPICAL SECTION
(DOUBLE-SIDED TONGUE & GROOVE JOINT)
(All reinforcing not shown for clarity)

NOTE:
Bottom Slab Joints in Type B Boxes may be single tongue & groove joints as shown in Section A-A when the Top Slab Joints are oriented as shown in Schematic "A".

SCHEMATIC "A"
TYPE B BOX SECTION PLACEMENT
FOR SINGLE TONGUE & GROOVE JOINTS

PRECAST CONCRETE BOX CULVERTS
- SUPPLEMENTAL DETAILS

REV 07/01/15
07/01/15

DESCRIPTION:

LAST REVISION
07/01/15
07/01/15

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PRECAST SEGMENT TO SEGMENT TONGUE & GROOVE TRANSVERSE JOINTS

TWO-PIECE PRECAST SEGMENT
ADDITIONAL JOINT DETAILS
(TYPE B BOX)
New Precast Box Culvert
Filter Fabric wrapped around construction joint
Outside Face of Wall/Slab
Longitudinal reinforcing
Mechanical couplers or 2'-0" extension of precast box reinforcing
Equivalent reinforcing to C-I-P design shown in plans

Cast-In-Place (C-I-P) Transition

Splice
Existing Box Culvert to remain

SECTION D-D
C-I-P TOE SLAB & CUTOFF WALL DETAILS AND CONNECTION TO PRECAST BOX
* Provide additional 6" depth of cutoff wall at no additional cost.

SECTION C-C
C-I-P HEADWALL DETAILS AND CONNECTION TO PRECAST BOX

SECTION B-B
TOP SLAB TO WALL JOINT (KEYED JOINT)
** Provide adequate width to satisfy shear strength requirements at joint

SECTION E-E
EXTERIOR WALL/SLAB TRANSITION DETAIL FOR PRECAST EXTENSION
(Type I Connection shown, Type II Connection similar)

** Provide additional 6" depth of cutoff wall at no additional cost.

TYPE B BOX LONGITUDINAL JOINTS

#4 STIRRUP BEND DIAGRAM

SECTION B-B
TOP SLAB TO WALL JOINT (HAUNCHED JOINT)
PIPE BLOCKOUT NOTES:
1. Cut box culvert reinforcement as required to maintain 2" cover.
2. For Precast Sections construct opening a minimum of 1'-6" away from any box to box joint, except opening may be a minimum of 1'-0" away from joint when at least 2'-0" of clearance to the box to box joint is provided on the opposite side of the pipe opening.
3. Pipe blockout diameter to be 6" greater than pipe outside diameter.
4. See Drainage Plans for size, placement, and invert elevation.

C-I-P END CAP DETAILS AND CONNECTION TO PRECAST BOX

SECTION F-F
(Headwall, Toe Slab and Cutoff Wall Reinforcing not shown for clarity)

VIEW G-G

SECTION H-H
(Showing additional blockout reinforcing only)

Provide 50% of vertical reinforcing cut by blockout on each side of pipe at each face (Typ.)
DIFFERENTIAL SETTLEMENT COUNTERMEASURES FOR PRECAST BOX CULVERTS

**LINK SLAB NOTES:**
1. Provide a Cast-In-Place Link Slab to ensure uniform joint opening of precast box culverts when the differential settlement shown in the plans exceeds the following limits, except that a Link Slab is not required for differential settlements less than 1/2".

   \[ \Delta Y = \frac{760 \times R \times W}{L^2} \]

   Where:
   - \( \Delta Y \) = Maximum Long-Term Differential Settlement (ft.)
   - \( R \) = Exterior height of Box Culvert (ft.)
   - \( W \) = Length of Box Culvert Segment (ft.)
   - \( L \) = Effective length for single curvature deflection (ft.)

2. Extend Link Slab to back face of headwalls and to limits of existing box culverts for extensions.

**ESTIMATED LINK SLAB QUANTITIES**

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<tr>
<th>ITEM</th>
<th>UNIT</th>
<th>QUANTITY</th>
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<tr>
<td>Class II or IV Concrete (Culvert)</td>
<td>CY/SF</td>
<td>0.0216</td>
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<tr>
<td>Reinforcing Steel (Roadway)</td>
<td>Lb./SF</td>
<td>1.52</td>
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**NOTE:**
Estimated quantities are based on the plan area of precast box slabs, and are provided for information only. No additional payment will be made for Link Slabs where these are required for the precast box culverts.

**DESIGN NOTE:**
1. Link Slab required when joint openings from differential settlement exceed 1/2" as determined in Link Slab Note 1.

**NOTES:**
1. All bar dimensions are out to out.
2. Lap splice length for Bars 4M is 1'-4" minimum.

**Filter Fabric, 2'-0" Min. overlaps**

**SCHEMATIC LONGITUDINAL SECTION (NEW CONSTRUCTION)**

**SCHEMATIC LONGITUDINAL SECTION (WIDENING)**

**BILL OF REINFORCING STEEL**

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<thead>
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<th>MARK</th>
<th>SIZE</th>
<th>NO. REQ'D</th>
<th>LENGTH</th>
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<tr>
<td>L</td>
<td>4</td>
<td>2 per Barrel/Ft.</td>
<td>1'-3&quot;</td>
</tr>
<tr>
<td>N</td>
<td>4</td>
<td>As Req'd</td>
<td>As Req'd</td>
</tr>
</tbody>
</table>

**REINFORCING STEEL BENDING DIAGRAMS**

**DIFFERENTIAL SETTLEMENT CALCULATIONS**

\[ \Delta Y = \frac{760 \times R \times W}{L^2} \]