

- d. The Contractor should check the lengths and layouts of the box culvert segment lengths for compatibility with the overall traffic control plan vs. “making adjustments in field” as described in note 9.
  - e. The Contractors’ attention is directed to the Precast Concrete Box Culvert Notes on Sheet 51 where he/she is directed to work closely with the Manufacturer, including his/her field representation.
3. DETAILS
- a. Sections A & B
    - The depth of the precast cut-off wall should be 4’-4” vs. 4’-0”.
    - Please provide material information for the “grout pad”.
    - How deep into the cut-off wall should the #6 bar be embedded?
  - b. Lifting Detail
    - What material will be used to fill the lifting device voids?
    - What is the size of the utility anchor and overall capacity of the lifting device?
  - c. Closure Hardware Detail
    - What does “watertight joints by others” mean? What are the limits and type of recommended joint material (in addition to the gasket) to assure that the joints will be watertight?
    - Should the closure hardware be placed on the outside face of the box?
- B. Box Culvert Design Calculations
- 1. General – Per recent discussions with the American Concrete Pipe Association (ACPA), BOXCAR Version 2.03 is based on the 2003/2004 LRFD code, and does not incorporate the requirements of the current LRFD code. The Contractor’s designer shall confirm and include appropriate statements and calculations (if required) that the box culvert design satisfies the requirements of the current LRFD code.
  - 2. In reviewing the BOXCAR output, it appears that the sidewall steel with 2.75 inches of cover is affected by the latest LRFD crack control equation, and may require more steel than what the BOXCAR program calculated.
  - 3. Should the lane loading portion of the HL-93 loading be included, vs. the HS-20 truck alone?
  - 4. For shorter clear spans, would the tandem vehicle produce slightly larger (10%) loads than and HS-20 truck?
  - 5. Does the program investigate the fatigue limit state combination?
  - 6. Given the presence of poor soil at the site, MJ contacted CSI and requested maximum Service I and Strength I foundation pressures. Though values were roughed out via email correspondences, we would like the Contractor’s designer to include something formally with their calculations.
  - 7. Calculations should include the load rating of the box culvert for the 7 standard axle configurations shown on Sheet 5, as detailed in Section 540.04 of the standard specifications. The load rating calculations may be provided after the fabrication of the elements, if allowed by the Agency Project Manager.
  - 8. All calculations and plans shall be stamped by a PE prior to fabrication.