DIVISION 03 – PIPE CULVERTS

03 10 00 GENERAL PROVISIONS

1. All work in this Division shall be completed in accordance with the provisions of Division 3 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures 2006 Edition (hereinafter referred to as *Standard Specifications*) except as amended or supplemented herein.

03 20 00 SPECIAL PROVISIONS-NCDOT

01. FLOWABLE FILL:

(9-17-02) (Rev 8-21-07) SP3 R30

A. Description

1. This work consists of all work necessary to place flowable fill in accordance with these provisions, the plans, and as directed.

B. Materials

1. Provide flowable fill material in accordance with Article 340-2 of the *2006 Standard Specifications.*

C. Construction Methods

1. Discharge flowable fill material directly from the truck into the space to be filled, or by other approved methods. The mix may be placed full depth or in lifts as site conditions dictate. The Contractor shall provide a method to plug the ends of the existing pipe in order to contain the flowable fill.

D. Measurement and Payment

1. At locations where flowable fill is called for on the plans and a pay item for flowable fill is included in the contract, *flowable fill* will be measured in cubic yards and paid for as the actual number of cubic yards that have been satisfactorily placed and accepted. Such price and payment will be full compensation for all work covered by this provision including but not limited to the mix design, furnishing, hauling, placing and containing the flowable fill.
2. Payment will be made under:

Pay Item	Pay Unit
Flowable Fill	Cubic Yard

03 30 00 SPECIAL PROVISIONS-ADDITIONAL

01. CORRUGATED ALUMINUM BOX CULVERT AND HEADWALLS

A. GENERAL

1. This item shall govern the furnishing and installation of an ALUMINUM BOX CULVERT and HEADWALLS for culverts and storm sewers for the types, sizes, and designations as shown on the plans and further specified in these specifications.

B. MATERIAL

1. The Aluminum Box culvert shall be fabricated from an ALUMINUM ALLOY coil, conforming to the current AASHTO M-219 and ASTM B 746 material specification. The materials shall also meet or exceed the latest N.C. Department of Transportation Specifications.
2. The Aluminum Box Culvert is to be fully welded inside and out to headwalls using two root welds and two finish welds on either side of the wall. All finish welds are to be ground to a smooth finish.
3. Headwall and Box Culvert are to be reinforced per AASHTO specifications and structural engineer's requirements.
4. All fabrication of the product shall occur within the United States.

5. Supplier must provide all necessary hardware, including: wale beams, caps, galvanized steel tieback rods with dead man anchor (DMA) plates, anchors, lugs, inserts, adjustable turnbuckles and all other materials relating to the culvert and headwall system necessary to complete the assembly.

C. CONSTRUCTION METHODS

1. Job Site Installation Assistance: A manufacturer's representative, with at least two (2) years of experience in the installation of this type of structure, is required to give technical advice with assembly of the structure and headwalls, as well as, to be on site during the installation and backfilling of the box culvert and headwalls through completion.
2. Excavation, Foundation Preparation, and Backfilling
   a. Install the pipe and pipe arch in accordance with Section 300 except place a minimum of 6 inch thickness of foundation conditioning material (Class VI #57) in accordance with the details shown in the plans.
   b. Backfill up to a minimum of 1.4' over the top of the pipe to top stone base with approved backfill.
   c. When transitioning from #57 stone to earth backfill or ABC stone, a minimum 4 oz. geotextile is required for separation of the different backfill materials.
3. Erection.
   a. Erect in accordance with the manufacturer's assembly diagrams and instruction sheets. All erection procedures and methods shall meet industry standards and shall be in accordance with AASHTO Standard Specifications for Highway Bridges, Section 26 and the Project Plans and Specifications
   b. Assemble the entire pipe culvert completely before placing any backfill. Install all bolts in accordance with the procedures specified by the manufacturer before backfill is placed. Check nut tightness with a properly calibrated torque wrench before, during, and after placing backfill.
   c. Construction Loads: Construction loads may be higher than final design loads. Follow manufacturer's guidelines.

D. FINAL DESIGN PLANS

1. Within ten (10) days after receiving purchase order, bidder will submit three (3) copies of detailed shop drawings, and one (1) copy of design calculations for review and approval. These drawings and calculations shall be provided by an independent engineering firm and stamped and sealed by a North Carolina Professional Engineer.

E. Measurement and Payment

1. *Corrugated Aluminum Box Culvert and Headwalls* will be measured and paid for as a lump sum and will include all labor material and equipment necessary to install the culvert and headwalls in accordance the plans and manufactures specifications. Installation cost includes all required excavation and backfill in accordance with section 300 and installation of 6" of foundation conditioning material in accordance with plan detail. Any required undercut in excess of that required to install the minimum required foundation conditioning material will be paid under "*FOUND CONDITIONING MATERIAL, MINOR STRS (SELECT MATL, CL VI (#57))"*
2. Payment will be made under:

Pay Item	Pay Unit
_'-_ " x _'-_ " x __'-_" C.A.A. BOX CLVT W/C.A.A. HEADWALLS (DETAIL)	EA