#### SP-09, Non-Standard Structures

Version Date: 02/14/2017 Revision Date: MM/DD/YYY by XXX

**1.0 DESCRIPTION**

The work covered by this special provision applies to non-standard endwalls and non-standard drainage structures.

**2.0 Construction Methods and Materials**

Work shall be in accordance with Section 414 *Box Culvert Excavation*, Section 420 *Concrete Structures*, Section 425 *Fabricating and Placing Reinforcement*, Section 830 *Brick Masonry Construction*, and Section 1040 *Masonry* of the NCDOT Standard Specifications. There will be an exception made to the articles of each referenced section for the measurement and payment and backfill materials.

Install 6” bedding #57 stone beneath all structures and drainage column behind endwalls.

Use cast in place concrete, brick masonry, block masonry or precast concrete construction as shown on the plans.

Concrete for the structure shall be Class A, as per the Standard Specification Section 1000 except that the minimum compressive strength at 28 days shall be 3,600 psi. Fill concrete indicated on the plans shall be class A or B as described in Section 1000 *Portland Cement Concrete Production and Delivery* of the NCDOT Standard Specifications.

Materials shall be as shown on the plans or described in Article 838-2 and 840-2 *Materials* of the NCDOT Standard Specifications.

Methods shall be as described in Article 838-3 and 840-3 *Construction Methods* of the NCDOT Standard Specifications.

Bottomless structures (i.e. catch basin chimneys, etc.) shall be attached to the base structure or culvert as shown on the plans. (If applicable)

1. **SUBMITTALS (If applicable)**

For all Non-Standard Structures, the Contractor shall submit the manufacturer’s certification and shop drawings for the Non-Standard Structures and those products to be used in the installation.

When a designed structure is not provided in the contract documents, the Contractor shall be responsible for the design of the Non-Standard Structures which are subject to review, comments, and approval. Submit two sets of detailed plans for review. Include all details in the submittal, including the size and spacing of the required reinforcement necessary to build the Non-Standard Structure. A North Carolina Registered Professional Engineer shall seal the submittal, which includes plans and design calculations. **The submittal must show the proposed openings (top and sides) and reinforcing for pipe connections, structure openings, and precast holes for steps, if necessary.**

All submittals shall be made a minimum of two weeks prior to construction or placing an order for materials for review by the Engineer.

**4.0 MEASUREMENT AND PAYMENT**

The quantity of non-standard endwalls and non-standard drainage structures will be measured and paid for in accordance with sections 838-4 and 840-4 *Measurement and Payment*, of the NCDOT Standard Specifications.

The payment for all work covered by this special provision will be made at the contract unit price per cubic yard for “Non-Standard Endwalls” and/or “Non-Standard Drainage Structures”. Such payment will be full compensation for all elements of work required to construct the structures in accordance with the specifications including, but is not limited to furnishing labor, materials, excavation, stone bedding and drainage column; hauling; disposal of materials; transporting and placing concrete, brick masonry, precast units, mortar, grout, reinforcing steel, hardware, castings and miscellaneous metal; fabrication, welding, and galvanizing to construct cast in place concrete, brick masonry, block masonry or precast concrete walls, weepholes, catch basins, junction boxes, spring boxes, manholes, concrete aprons and other non-standard endwalls and non-standard drainage structures, with all necessary steps, and other hardware, and connection of the structure.

Backfill will be made in accordance with the *Earthwork, Excavation, Unsuitable Materials, and Backfill Materials* Special Provision.

Fabricated steel and gray iron cast frames, grates, manhole rings and covers shall be measured and paid separately in accordance with the contract.

Payment will be made under:

**NON-STANDARD ENDWALL ………………………………………………………………….………………………………………………………….CY**

**NON-STANDARD DRAINAGE STRUCTURE CY**