

## SECTION 272 POND OUTLET STRUCTURE, CONCRETE

**272.01 Description.** This work consists of furnishing, fabricating, and constructing a pond outlet structure at the locations shown on the Plans and as directed by the Engineer.

### MATERIALS.

**272.02 Borrow.** Borrow for backfill material shall be Clay Borrow, Type 2 and shall conform to the requirements of [Subsection 274.02](#).

**272.03 Concrete.** Concrete used in risers may be precast or cast-in-place. Concrete used in anti-seep collars shall be cast-in-place only. Concrete used in risers and anti-seep collars shall be Class A conforming to the requirements of [Section 812](#)

**272.04 Reinforcing Steel.** Reinforcing steel shall be Grade 60 (Grade 400) and conform to the requirements of [Section 603](#).

**272.05 Grout.** Grout shall be non-shrink conforming to the requirements of ASTM C 1107.

**272.06 Pipe.** Reinforced concrete pipe used for the principal spillway shall conform to [Section 612](#).

**272.07 Gaskets.** Gaskets for reinforced concrete pipe shall conform to [Subsection 612.03](#).

**272.08 Steps.** Steps shall be molded plastic with a reinforcing bar core, and shall conform to the requirements of AASHTO M 31/M 31M, ASTM A 478, and ASTM D 4101.

### CONSTRUCTION METHODS.

**272.09 Excavation.** The Contractor shall excavate to the required depth. The foundation upon which the structure is to be placed shall be compacted to a firm and level surface.

#### 272.10 Outlet Structure.

- a. *Riser.* Concrete risers shall be poured in place or pre-cast. If the concrete risers are pre-cast, the Contractor shall design the lifting lugs, and all hardware required to transport and install the structure. The top slab shall not be used to lift the riser structure. Any space between pipes and the walls of the pre-cast riser shall be filled with grout. The largest dimension of the opening in the riser of connection of the outfall pipe shall be no greater than the outfall pipe diameter plus 4" (100 mm).
- b. *Anti-Seep Collars.* The subgrade soil shall be excavated to the dimensions of the bottom half of the collars. Concrete forming the bottom half of the anti-seep collars shall be poured into the excavation using the adjacent soil as the form. Concrete formwork shall be used to form the top half of the anti-seep collars.
- c. *Principal Spillway Outfall Pipe.* The principal spillway pipe shall have Class A pipe bedding. Shims used to establish grade and alignment of the pipe shall be made of concrete. Lumber or bricks shall not be used for shims. Care shall be exercised during backfill to prevent any pipe movement from its horizontal and vertical alignment.

When the principal spillway outfall pipe is to be placed partially or completely in fill, the fill embankment shall be constructed 24" (600 mm) above the proposed top of pipe. A trench shall then be excavated to the required grade with side slopes no steeper than 1:1.

The Contractor shall place bell and spigot pipes with the bell end upstream. The pipe trench shall be kept free of standing water during pipe placement and backfilling using an approved dewatering method.

**272.11 Backfill.** The backfill material next to pipes and other structures shall be placed to the required elevation in 4" (100 mm) horizontal loose-thickness lifts at the same rate on all sides to prevent damage from unequal loading. Each lift shall be compacted by a manually directed power tamper under and around the pipe and other structures to 90% or more of maximum dry density. Compaction next to cast-in-place concrete structures will not begin until the concrete has reached enough strength to support the load.

A minimum depth of 24" (600 mm) of hand compacted backfill shall be placed over the pipe before crossing it with construction equipment.

**272.12 Method of Measurement.** The quantity of pond outlet structure, concrete will be measured as the actual number of each pond outlet structure, concrete installed and accepted.

**272.13 Basis of Payment.** The quantity of pond outlet structure, concrete will be paid for at the Contract unit price for each pond outlet structure, concrete. Price and payment will constitute full compensation for excavating; for dewatering; for all ground preparation; for furnishing and placing all materials, reinforcing steel, concrete, concrete pipes, gaskets, grout, pipe bedding, steps, backfill, and all other materials required for pond outlet structure, concrete; for welding; and for all labor, equipment, tools, and incidentals necessary to complete the work.

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