

SECTION 02466

DRILLED CAISSON

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Material, equipment, and procedures for constructing drilled caissons.

1.2 RELATED SECTIONS

- A. Section 03055: Portland Cement Concrete.
- B. Section 03211: Reinforcing Steel and Welded Wire.

1.3 QUALITY ASSURANCE

- A. If caisson installation is unsatisfactory:
 - 1. Immediately remove the reinforcing steel cage and the concrete.
 - 2. Replace the reinforcing cage and place concrete in a satisfactory manner.
 - 3. Submit proposed remedial action for approval if the reinforcing steel and concrete cannot be removed.

1.4 ACCEPTANCE

- A. Drilled caissons may be accepted at a reduced price when the concrete strength is below that specified.
 - 1. Price adjustment pay factor following Section 03055.
 - 2. The Department applies the pay factor to the total length of any caisson containing concrete with strength tests falling below that specified.

PART 2 PRODUCTS

2.1 PORTLAND CEMENT CONCRETE

- A. Class A. Follow Section 03055.

- B. Modify as follows when placed under water:
 - 1. Maintain the same minimum compressive strength at 28 days.
 - 2. Add at least one bag of additional cement per cubic yard of concrete for a minimum of seven bags of cement per cubic yard.
 - 3. Proportion concrete to facilitate pumping.
 - 4. Use water reducers or plasticizers per Section 03055.
 - 5. Keep slump between 4 inches and 8 inches when tested at the truck.

2.2 REINFORCING STEEL

- A. Refer to Section 03211.

2.3 CAISSON DRILLING EQUIPMENT

- A. Capable of:
 - 1. Drilling holes of the required diameter and depth in the type of materials located at the footings.
 - 2. Installing and removing casing.

PART 3 EXECUTION

3.1 PREPARATION

- A. Drilling holes:
 - 1. Drill straight, vertical holes to the tip elevations on plans or as determined by Engineer.
 - 2. Remove all loose material from the bottom of the drilled holes before placing concrete.
 - 3. Do not use water for drilling operations.
- B. Casing:
 - 1. Furnish and place casing when required to prevent the drilled hole from caving in and remove casing as the concrete is placed.
 - 2. Keep the bottom of the casing between 2 feet and 5 feet below the top of the concrete surface when withdrawing.
 - 3. Prevent concrete separation when withdrawing the casing.

3.2 PLACING CONCRETE

- A. Fill drilled holes within 24 hours after drilling.

- B. Prevent concrete from striking the steel-reinforcing cage during free-fall. Do not allow the free-fall of concrete to exceed 5 feet without the use of a tremie or a flexible metal spout.
- C. Do not vibrate concrete during initial placement. Remove all muck laitance and degraded concrete from the caisson.
- D. Vibrate the concrete during placement to at least 10 feet below top of casing.

3.3 PLACING CONCRETE UNDER WATER

- A. Submit procedure to Engineer and secure Engineer's written approval to place concrete under water.
- B. Use concrete pumping equipment capable of pumping at least 50 yd³/hr against a minimum 20 feet head of concrete measured from the discharge end of the pump hose extension.
- C. Use a rigid, steel pipe pump hose extension with tight couplings straight to within ½ inch in 10 feet.
 - 1. Length of extension must be greater than or equal to the depth of the caisson.
 - 2. Inside diameter must be greater than or equal to the concrete pump discharge hose, but not more than one-half of the inside diameter of the reinforcing cage.
- D. Purge the pipe of water.
 - 1. Insert a sturdy plastic ball or equivalent into the top of the pump hose extension before connecting the hose from the concrete pump.
 - 2. The ball must fit snugly into the pump hose extension when the hose is filled. The hose must be strong enough to resist rupture.
 - 3. Prime the hose and pipe with Portland Cement slurry.
- E. Lower a small diameter pole with an attached flat plate into the hole to determine the top surface of concrete.
 - 1. Both pole and pipe should be marked so that the length of penetration can be determined immediately.
 - 2. Prevent the end of the pipe from becoming plugged with soil from the bottom of the hole.
- F. Begin pumping the concrete immediately after setting the reinforcing cage and pipe in the hole. Do not begin raising the pipe until the concrete surface is 10 feet above the bottom of the pipe.

- G. Keep the bottom of the pipe at least 5 feet below the top of the concrete until the pour is complete and all muck, laitance, and all unsuitable concrete is removed. Provide a positive hold down if the pipe floats to ensure that the minimum 5 feet penetration is maintained.

3.4 FIELD QUALITY CONTROL

- A. If plugging of the pipe, equipment breakdown, or loss of the seal at the end of the pipe occurs:
 - 1. Pull the pipe, reset it 2 feet below the top of the concrete, and purge it.
 - 2. Lower the pipe to at least 5 feet below the top of the placement, and continue pumping concrete until all degraded concrete has lifted to the top of the caisson.
 - 3. Remove all muck laitance and degraded concrete.

END OF SECTION