

ITEM 466

HEADWALLS AND WINGWALLS

466.1 Description. Furnish, construct, and install concrete headwalls and wingwalls for drainage structures and underpasses.

466.2 Materials.

A. General. Furnish materials in accordance with the following:

- Item 420, “Concrete Structures”
- Item 421, “Structural Concrete”
- Item 440, “Reinforcing Steel.”

Unless otherwise shown on the plans, use Class C concrete for cast-in place and precast concrete units. Furnish cast-in-place or precast headwalls and wingwalls unless otherwise shown on the plans.

B. Fabrication. Fabricate cast-in-place concrete units and precast units in accordance with Item 420, “Concrete Structures.” For headwalls and wingwalls use the following definitions:

- “Headwalls” refers to all walls, including wings, at the ends of single-barrel and multiple-barrel pipe culvert structures.
- “Wingwalls” refers to all walls at the ends of single-barrel or multiple-barrel box culvert structures.

For precast units, provide no more than 4 lifting holes in each section. Lifting holes may be cast, cut into fresh concrete after form removal, or drilled. Provide lifting holes large enough for adequate lifting devices based on the size and weight of the section. The maximum hole diameter is 3 in. at the inside surface of the wall and 4 in. at the outside surface. Do not cut more than 1 longitudinal wire or 2 circumferential wires per layer of reinforcing steel when locating lift holes. Repair spalled areas around lifting holes.

Before shipment from the casting or fabrication yard, clearly mark the following on each precast unit:

- the date of manufacture,
- the name or trademark of the manufacturer, and
- the type and size designation.

Store precast units on a level surface. Do not place any loads on precast concrete units until design strength is reached. Do not ship units until design strength requirements have been met.

Precast units may be rejected for not meeting any one of the specification requirements. Individual units may also be rejected for fractures or cracks passing through the wall or surface defects indicating honeycombed or open texture surfaces. Remove rejected units from the project, and replace them with acceptable units meeting the requirements of this Item.

Occasional imperfections in manufacture or accidental damage sustained during handling may be repaired. The repaired units will be acceptable if they conform to the requirements of this Item and the repairs are sound, properly finished, and cured in conformance with pertinent specifications.

466.3

Construction.

- A. General. Remove portions of existing structures in accordance with Item 495, "Removing Old Structures." Drill, dowel, and grout in accordance with Item 420, "Concrete Structures."
- B. Excavation, Shaping, Bedding, and Backfill. Excavate, shape, bed, and backfill in accordance with Item 400, "Structural Excavation." Take special precautions in placing and compacting the backfill to avoid any movement or damage to the units. Bed precast units on foundations of firm and stable material accurately shaped to conform to the bases of the units.
- C. Placement of Precast Units. Provide adequate means to lift and place the precast units. Fill lifting holes with mortar or concrete and cure. Precast concrete or mortar plugs may be used.
- D. Connections. Make connections to new or existing structures in accordance with the details shown on the plans. Furnish jointing material in accordance with Item 460, "Reinforced Concrete Pipe," or as shown on the plans.

When removing existing headwalls, also remove a length of the existing pipe from the headwall to the joint as shown on the plans or as approved. Re-lay the removed pipe if approved, or furnish and lay a length of new pipe.

466.4

Measurement. The quantity to be paid shall be measured according to the unit(s) stated in the proposal, which shall follow the methods described below:

- A. Headwalls. Headwalls will be measured by each end of a structure.
- B. Wingwalls. Wingwalls will be measured by one of the following methods:
 - 1. Square Foot. Wingwalls will be measured by the square foot of the front surface area of the wall of each type. Unless otherwise shown on the plans, the area will be measured from the top of the footing or apron to the top of the wall. If there is

no footing or apron, then measurement is from the bottom of the wall.

2. Each. Wingwalls will be measured by each end of a structure.

466.5 Payment. The work performed and materials furnished in accordance with this Item and measured as provided under “Measurement” will be paid for at the price bid for “Headwalls” of the type and pipe size (diameter or design) specified, “Wingwalls” of the type specified when measurement is by the square foot, or “Wingwalls” of the type and wall height specified when measurement is by each. For payment purposes, the wingwall height will be rounded to the nearest foot.

This price is full compensation for constructing, furnishing, transporting, and installing the headwalls or wingwalls; connecting to existing structure; breaking back, removing and disposing of portions of the existing structure, and replacing portions of the existing structure as required to make connections; excavation and backfill; and concrete, reinforcing steel, corrugated metal pipe or reinforced concrete pipe, equipment, labor, tools, and incidentals.

Apron concrete or riprap between or around the wingwalls of single- or multiple-barrel box culvert structures will be measured and paid for in accordance with Item 493, “Riprap.”

The removal and re-laying of existing pipe or the furnishing of new pipe to replace existing pipe will not be paid for directly but will be considered subsidiary to this Item.

END OF ITEM 466