

## ITEM 602 MASONRY

### 602.01 Description

### 602.02 Materials

### 602.03 Construction Requirements

### 602.04 Method of Measurement

### 602.05 Basis of Payment

**602.01 Description.** This work consists of constructing headwalls, pipe cradles, collars, and other brick and masonry units of the types and sizes specified.

Use removed or excavated materials in the Work when the material conforms to the specifications; if not, then recycle or dispose of the material according to 105.16 and 105.19.

**602.02 Materials.** Furnish materials conforming to:

Backfill .....	203
Concrete, Class C.....	499 and 511
Water for grout and mortar .....	499.02
Reinforcing steel .....	509.02
Cement for mortar.....	701.01 through 701.07
Fine Aggregate for Mortar or Grout.....	703.03
Granular base ....Granular material Type B (203.02.R)	
Brick and masonry units .....	704.01, 704.02, 704.03
Nonshrink mortar .....	705.22
Lime for mortar.....	712.04.A

**602.03 Construction Requirements.** Construct the designated items as shown on the plans.

A. Excavate to dimensions that provide ample room for construction. Remove obstructions as necessary to perform this work.

Protect the sides of all excavations from caving by providing suitable sheeting, shoring, and bracing. Use excavation methods that do not disturb the original material below the bottom of footers or below the additional 6 inches (150 mm) required for precast structures.

If the material found at the bottom of the headwall or below the additional 6 inches (150 mm) required for precast structures is not suitable for a foundation, excavate to further depth to provide a suitable foundation. Backfill the void left by the additional excavation with granular base. The City will pay for this additional work according to 109.05.

Backfilling shall follow completion of the work as closely as the construction will allow. Backfill with granular base or soil. Place backfill in 6-inch (150 mm) loose lifts.

B. Compaction requirements are according to Item 203 except for the following:

Perform four passes per lift with additional passes as required until 95 percent compaction. Use compaction equipment with a minimum total weight of, or minimum centrifugal force of, 1 ton (0.9 metric ton). Supply the manufacturer's specifications for this equipment to verify these requirements.

### 602.03

C. Cast-in-place structures are headwalls, pipe cradles, collars, and other units. Construct cast-in-place structures according to the corresponding Standard Drawing using methods specified in Items 499, 511, and 509.

D. Pre-cast structures are half height headwalls for conduits up to a maximum of 78 inches (1980 mm). Pre-cast half-height headwalls for elliptical and pipe arch conduits may be constructed from templates of the actual conduit being supplied, up to a maximum 78 inch (1980 mm) (round equivalent) to the project to ensure the opening is OD plus one inch. Submit Working Drawings to the Engineer for approval, on a project by project basis, of pre-cast half-height headwalls for elliptical and pipe arch conduit. Allow 4 weeks for review and approval of Working Drawings. Failure to furnish the Working Drawings will result in rejection of the pre-cast structure. The drawings will include the following:

1. All reinforcing steel will be epoxy coated.
2. Attachment detail for metal or plastic conduit
3. Non-corrosive lifting devices.
4. Maximum opening is conduit outside diameter plus 1 inch (25 mm) for each conduit material type.
5. All openings to be filled with nonshrink mortar including all lifting device voids.
6. Fill the void between the precast half height headwall and the conduit by using nonshrink mortar.
7. Apply marking, either stamped or painted, to the headwall to ensure each headwall size is matched to the proper conduit size and material type.

E. Pre-cast structures are for slab footers, cut off walls, wingwalls, and headwalls for use with Items 706.05, 706.051 and 706.052. Submit structural design criteria, analysis method and structural details for approval to the Engineer. Allow 4 weeks for review and approval of Working Drawings. Failure to furnish the Working Drawings will result in rejection of the precast structure. The drawings will include the following:

1. All reinforcing steel will be epoxy coated.
2. Furnish PE signed sealed dated.
3. Non-corrosive lifting devices.
4. All openings to be filled with non-shrink mortar including all lifting hook voids.

F. Masonry units structures are headwalls, pipe cradles, collars, and other units. Thoroughly wet masonry units before laying the mortar. Lay masonry units with full mortar joints. Take adequate precautions to prevent the mortar from freezing. Do not set masonry units having a temperature of 40 °F (4 °C) or less with mortar until heated. When required, heat to ensure that a temperature of 50 to 80 °F (10 to 27 °C) is obtained throughout the entire masonry units. Cure the exposed surfaces of the masonry units by covering with wet burlap for 48 hours or by applying curing membrane according to Item 511. Construct the masonry units structures according to the corresponding Standard Drawing. Use one of the following mortars:

1. One part Portland cement to two parts sand by volume. The Contractor may add lime in an amount not to exceed 10 percent of the cement by weight
2. One part masonry cement to two parts sand by volume.

**602.04 Method of Measurement.** The City will measure Brick Masonry, Block Masonry, and Concrete Masonry by the number of cubic yards (cubic meters) calculated from dimensions shown on the plans.

**602.05 Basis of Payment.** When a precast structure is used, payment is based on the number of cubic yards (cubic meters) required for the cast in place item and is considered full compensation for construction of the precast structure.

The City will pay for accepted quantities at the contract prices as follows:

<b>Item</b>	<b>Unit</b>	<b>Description</b>
602	Cubic Yard (Cubic Meter)	Brick Masonry
602	Cubic Yard (Cubic Meter)	Block Masonry
602	Cubic Yard (Cubic Meter)	Concrete Masonry