

Section 02631**PRECAST INLETS, HEADWALLS, AND WINGWALLS****1.0 GENERAL****1.01 SECTION INCLUDES**

- A. Precast concrete inlets for storm or sanitary sewers, including cast iron frame and plate or grate.
- B. Precast concrete headwalls and wingwalls for storm sewers.
- C. References to Technical Specifications:
 - 1. Section 01200 – Measurement and Payment Procedures
 - 2. Section 01350 – Submittals
 - 3. Section 01630 – Product Options and Substitution
 - 4. Section 03300 – Cast-in-Place Concrete
 - 5. Section 02542 – Concrete Manholes and Accessories
 - 6. Section 02318 – Excavation and Backfill for Utilities
- D. Referenced Standards:
 - 1. American Society for Testing and Materials (ASTM)
 - a. ASTM C 76, “Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
 - b. ASTM C 270, “Standard Specification for Mortar for Unit Masonry”
- E. Definitions:
 - 1. Normal Depth Type A, Type B, Type C and Type E Inlets - depth of 2.25 feet or less (2' 3") plus pipe inside diameter when measured from grating, bottom of gutter, or throat to flow line of inlet lead.
 - 2. Normal Depth Type BB Inlet - depth of 2.55 feet (2' 6 5/8 ") plus pipe inside diameter when measured from curb beam to flow line of inlet lead.
 - 3. Extra Depth Inlet - specified depth exceeding normal depth for the type inlet used.

1.02 MEASUREMENT AND PAYMENT

- A. Measurement for normal depth inlets is on a per each basis, complete in place.
- B. When extra depth is specified on the Plans, measurement for extra depth inlets is on a vertical foot basis for each foot in excess of normal depth, measured and complete in place.
- C. Measurement for headwalls and wingwalls is on a per each basis, complete in place.
- D. Payment for inlets and for culvert headwalls and wingwalls includes connection of lines, and furnishing and installing frames, grates, rings and covers.
- E. Refer to Section 01200 – Measurement and Payment Procedures.

1.03 SUBMITTALS

- A. Make Submittals required by this Section under the provisions of Section 01350 – Submittals.
- B. Submit Shop Drawings for approval of design and construction details for precast concrete inlets, headwalls and wingwalls. .
- C. Submit proposals for using equivalent construction products or processes according to Section 01630 – Product Options and Substitution.
- D. Submit manufacturer’s data and details for frames, grates, rings, and covers.

1.04 STORAGE AND SHIPMENT

- A. Store precast units on level blocking. Do not place loads on them until design strength is reached. Shipment of acceptable units may be made when the 28 day strength requirements have been met.

2.0 PRODUCTS**2.01 MATERIALS**

- A. Concrete: Concrete for precast machine-made units meeting requirements of ASTM C 76 regarding reinforced concrete, cement, aggregate, mixture, and concrete test. Minimum 28-day compressive strength shall be 4,000 psi.
- B. Reinforcing steel: Conform to requirements of Section 03300 – Cast-in-Place Concrete. Place reinforcing steel to conform to details shown on Plans and as follows:

1. Provide a positive means for holding steel cages in place throughout production of concrete units. The maximum variation in reinforcement position is plus or minus 10 percent of wall thickness or plus or minus 1/2 inch whichever is less. Regardless of variation, the minimum cover of concrete over reinforcement as shown on the Plans shall be maintained.
 2. Welding of reinforcing steel is not permitted unless noted on the Plans.
- C. Mortar: Conform to requirements of ASTM C 270, Type S using Portland cement.
- D. Miscellaneous metal: Cast-iron frames and plates conforming to requirements of Section 02542 – Concrete Manholes and Accessories.

2.02 SOURCE QUALITY CONTROL

- A. Tolerances: Allowable casting tolerances for concrete units are plus or minus 1/4 inch from dimensions shown on the Plans. Concrete thickness in excess of that required will not constitute cause for rejection provided that such excess thickness does not interfere with proper jointing operations.
- B. Precast Unit Identification: Mark date of manufacture and name or trademark of manufacturer clearly on the inside of inlet, headwall or wingwall.
- C. Rejection: Precast units may be rejected for non-conformity with these specifications and for any of the following reasons:
1. Fractures or cracks passing through the shell, except for a single end crack that does not exceed the depth of the joint.
 2. Surface defects indicating honeycombed or open texture.
 3. Damaged or misshaped ends, where such damage would prevent making a satisfactory joint.
- D. Replacement: Immediately remove rejected units from the work site and replace with acceptable units.
- E. Repairs: Occasional imperfections resulting from manufacture or accidental damage may be repaired if, in the opinion of the Engineer, repaired units according to requirements of these specifications.

3.0 EXECUTION**3.01 EXAMINATION**

- A. Verify lines and grades are correct.
- B. Verify compacted subgrade will support loads imposed by inlets.

3.02 INSTALLATION

- A. Install inlets, headwalls, and wingwalls complete in place to the dimensions, lines and grades as shown on the Plans.
- B. Excavate in accordance with requirements of Section 02318 – Excavation and Backfill for Utilities.
- C. Bed precast concrete units on cement stabilized sand on foundations of firm, stable material accurately shaped to conform to the shape of unit bases.
- D. Provide adequate means to lift and place concrete units.

3.03 FINISHES

- A. Use a cement-sand mortar mix to seal joints, fill lifting holes, and as otherwise required.
- B. When the box section of the inlet has been completed, shape the floor of the inlet with mortar to conform to Plans details.
- C. Accurately adjust cast iron inlet plate frames to line, grade, and slope. Grout frame in place with mortar.

3.04 INLET WATERTIGHTNESS

- A. Test each inlet for leaks. Verify that inlets are free of visible leaks. Repair leaks in an approved manner.

3.05 CONNECTIONS

- A. Connect inlet leads to the inlets as shown on the Plans. Use non-shrink jointing material as shown on the Plans or as approved. Make connections water tight.

3.06 BACKFILL

- A. Backfill the area of excavation surrounding each completed inlet, headwall or wingwall according to the requirements of Section 02318 – Excavation and Backfill for Utilities.

END OF SECTION