

**SECTION 02734**  
**CONCRETE FOUNDATIONS**

**02734.01 GENERAL**

**A. Description**

Concrete foundations shall include, but not necessarily be limited to, the construction of concrete foundations for lighting standard installations and traffic control devices shown on the Plans and in accordance with the Contract Documents, or as directed by the Engineer. This work shall include excavation, backfilling, placing concrete, and all incidentals necessary to complete the work.

**B. Related Work Included Elsewhere**

1. Structure excavation; Section 02220.
2. Portland cement concrete; Section 03310.
3. Painting; Section 09900.
4. Cast-In-Place Concrete; Section 03300.

**C. Quality Assurance**

1. The Engineer will inspect all materials and work to ensure compliance with the Contract Documents.
2. Concrete shall meet the quality assurance requirements as specified in Section 03310.

**D. Submittals**

Shop drawings shall be submitted as specified in the "General Provisions" for all concrete lighting and signal foundations. The shop drawings shall show the overall dimensions of the foundation, reinforcing size and location, and bolt circle data.

**02734.02 MATERIALS**

**A. Materials Furnished by the County**

The County will not furnish any materials for concrete foundations.

**B. Contractor's Options**

Not applicable.

**C. Detailed Material Requirements**

## 1. Portland Cement Concrete

Portland cement concrete for concrete foundations shall be Mix No. 3 as specified in Section 03310.

## 2. Grout

Grout shall meet the requirements specified in Section 03600 and shall be non-shrink, non-metallic, and have a compressive strength of at least 3,000 psi at 28 days.

## 3. Reinforcing Steel

Reinforcing steel shall consist of deformed bars meeting the requirements of AASHTO M 31, Grade 60.

## 4. Conduit

Steel electrical conduit and fittings shall meet the requirements of Federal Specification WW-C-581.

## 5. Anchor Bolts, Nuts, and Washers

Anchor bolts, nuts, and washers shall be high strength steel having minimum yield strength between 55,000 psi and 70,000 pi and an ultimate tensile strength between 80,000; and 90,000 psi. The differential between yield strength and ultimate tensile strength shall be a minimum of 15,000 psi. Each anchor bolt shall be provided with a hexagonal nut and a square leveling nut. The hexagonal nut shall conform to the requirements of ASTM A 194, Grade 2 or 2H. The square nut shall conform to the requirements of ASTM A 307. Anchor bolt washers shall be of high-strength, low-alloy steel having a minimum yield strength of 55,000 psi. Anchor bolts shall have the 10 inches of thread plus an additional 6 inches hot dip galvanized. Nuts and bolts shall be galvanized as follows:

- a. Machine bolts, drift pin bolts, and similar threaded fasteners shall be mechanically or hot-dip galvanized. The coating shall meet the thickness, adherence, and quality requirements or ASTM A 153.
- b. Machine bolts, turn bolts, and drift bolts shall meet the requirements of ASTM A 307. The grade will be specified on the Plans or "Special Provisions."
- c. Bolts used as drift pins shall be made of carbon tool steel having a Rockwell hardness of C50 to C53 on the shank and C30 to C37 on the head.

6. Paint

Zinc rich primers shall be applied on shot blast cleaned steel for new structures or sand blast cleaned structures that are to be rehabilitated. Primers shall be self cure inorganic zinc alkyl silicate base or organic vehicle and meet the requirements of SSPC PS 12.00.

Zinc rich primer for galvanized surfaces shall meet the requirements of Federal Specification TT-P-641, Type 11, zinc dust - zinc oxide.

7. Clear Liquid Membrane-Forming Compound

Liquid membrane-forming compounds shall meet the requirements of AASHTO M 148.

### 02734.03 EXECUTION

#### A. General

Footings, foundation, and bolt circle data shall be as shown on the Plans or in accordance with approved shop drawings. Anchor bolts shall be plumb. Suitable templates for setting anchor bolts shall be accurately set at the top of the bolts and left in place until concrete has obtained initial set.

Galvanized parts that have been cut or chipped to bare metal shall be regalvanized or repaired to the satisfaction of the Engineer.

#### B. Excavation

The Contractor shall perform all excavation to neat lines and to the elevations and dimensions shown on the Plans. All excavation work will be inspected and approved by the Engineer before proceeding with construction.

#### C. Concrete Placement

It is intended that all concrete be placed against undisturbed earth. However, where the existing ground will not retain its shape during or after auguring, or if the excavation should show any tendency to cave in before placing the foundation, the Contractor shall provide a sleeve or form to retain the earth and receive the concrete.

The sleeve shall be composed of sheet steel formed to the required shape and shall be carefully placed to the specified depth. As the concrete is poured, the sleeve shall be carefully withdrawn so that the wet concrete will flow into intimate contact with the sides of the excavation. When the sleeve is entirely withdrawn, above grade form and template and complete foundation shall be provided.

Tops of foundations shall be screeded to a dense smooth finish. Exposed surfaces shall be cured by use of a liquid membrane-curing compound.

**D. Backfill**

Material used for backfill shall be free from topsoil, loam, organic, frozen, or other undesirable material. No trash shall be allowed to accumulate in the spaces to be backfilled, and these spaces shall be well cleaned before backfill is placed. Backfill material shall be material from the excavation or other sources that shall meet the requirements of Section 02240.02. All backfill shall be carefully compacted in layers not exceeding 8 inches in loose thickness and compacted with mechanical or vibratory compaction equipment to at least 95% of maximum density at a moisture content within 2% of the optimum in accordance with AASHTO T 180, Method C.

**02734.04 METHOD OF MEASUREMENT**

Measurement for concrete foundations for lighting standard installations and traffic control devices will not be made.

**02734.05 BASIS OF PAYMENT****A. General**

Payment will be made for contingent items when ordered by the Engineer. Payment will be as specified in Sections 02951, 02952, 02953, 02954, 02955, 02956, and 02957.

**B. Concrete Foundation**

Payment for concrete foundations for highway lighting installations and traffic control devices will not be made but will be considered incidental to the respective installations.