

Special Specification 4128

Precast Light Pole Foundation



1. DESCRIPTION

Construct foundations consisting of reinforced precast concrete cylindrical shafts.

2. MATERIALS

Furnish materials that meet the requirements of the following items:

- Item 400, "Excavation and Backfill for Structure"
- Item 401, "Flowable Backfill"
- Item 420, "Concrete Substructures"
- Item 421, "Hydraulic Cement Concrete"
- Item 440, "Reinforcement for Concrete"

Use concrete for precast cylindrical shafts that meets the requirements of Table 1 unless otherwise shown on the plans.

Table 1
Concrete for Precast Shafts

Drilled Shaft Type	Concrete
Reinforced	Class C

Use coarse aggregate Grade 4, 5, or 6 for reinforced precast concrete shafts.

Use a water-reducing admixture in accordance with DMS-4640, "Chemical Admixtures for Concrete," in all concrete where low permeability is required.

Use concrete with slump that meets the requirements of Table 2 as determined by Tex-415-A.

Table 2
Slump Requirements

Placement Type	Minimum Acceptable Placement Slump, in.	Recommended Design and Placement Slump, in.	Maximum Acceptable Placement Slump, in.
Dry	4	5 1/2	7

Provide concrete that will maintain a slump of at least 4 in. throughout the entire anticipated time of concrete placement. Time of concrete placement is described in Section 416.3.6., "Concrete"

3. CONSTRUCTION

Submit precast concrete foundation details for approval in a timely manner that will allow for a review period, acceptance and fabrication prior to anticipated installation activities. Include the following with the submittal.

- Name and experience record of the precast concrete manufacturer.
- Submit shop drawings with details of the precast concrete foundation including diameter, shaft length, reinforcement schedule and placement, embedded conduit placement, anchor bolt placement, and lifting provisions.
- Provide signed and sealed design calculations for the precast concrete light pole foundation. Calculations will be based on the project geotechnical report.

Submit precast shaft foundation installation plan for review no later than one month before installation of the shaft foundation. Include the following in the plan:

- Name and experience record of the foundation drilling superintendent who will oversee shaft foundation excavations for this project.
- List of proposed equipment to be used, including cranes, drills, augers, bailing buckets, casing, etc.
- Details of overall construction operation and the sequence of shaft installation.
- Details of shaft foundation excavation methods.
- Details of foundation placement, including base preparation and operational procedures for installation and backfilling methods.

The installation plan will be reviewed for conformance with the plans, specifications and special provisions. The Contractor will be notified within 14 days of receipt of the installation plan of any additional information required or changes necessary to meet the contract requirements. All procedural approvals given will be subject to trial in the field and will not relieve the Contractor of the responsibility to satisfactorily complete the work as detailed in the plans and specifications.

Place the shaft to within the following tolerances:

- Vertical plumbness—1 in. per 10 ft of depth.
- Center of shaft located under column—1 in. of horizontal plan position.
- Center of shaft located under footing—3 in. of horizontal plan position.

- 3.1. **Excavation.** Perform all work in accordance with Item 400, "Excavation and Backfill for Structures." Excavate as required for the precast concrete shafts through all materials encountered. The depth of the precast foundations will be determined by the precast manufacturer based on the project geotechnical report and engineered to resist the applied loads.

Removal of man-made obstructions not shown on the plans will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method." Adjust the bottom of the shaft or alter the foundation if satisfactory founding material is not encountered at plan elevation, as approved to satisfactorily comply with design requirements. Blasting is not allowed for excavations.

Stop drilling if caving conditions are encountered and adopt a construction method that stabilizes the shaft walls.

Do not excavate a shaft within 2 shaft diameters (clear) of an open shaft excavation, or one in which concrete has been placed in the preceding 24 hr.

Dispose of material excavated from shafts and not incorporated into the finished project in accordance with the plans and with federal, state, and local laws.

Provide suitable access, lighting, and equipment for proper inspection of the completed excavation and checking the dimensions and alignment of shafts excavation.

- 3.2. **Core Holes.** Take cores to determine the character of the supporting materials as directed by the engineer. Use a method that will result in recovery of an intact sample adequate for judging the character of the founding material. Such cores should be at least 5 ft. deeper than the proposed founding grade or a depth equal to the diameter of the shaft, whichever is greater. Take these cores when the excavation is complete.
- 3.3. **Casing.** Use casing when necessary to prevent caving of the material, or when required as part of the Contractor's Safety Plan. Provide casing with an inside diameter not less than the specified diameter of the precast shaft foundation. No extra compensation will be made for concrete required to fill an oversized casing or oversized excavation. Use casing strong enough to withstand handling stresses and pressures of concrete and of the surrounding earth or water, and that is watertight, smooth, clean, and free of accumulations of hardened concrete.
- 3.4. **Reinforcing Steel.** Perform all work in accordance with Item 440, "Reinforcement for Concrete." Completely assemble the cage of reinforcing steel and place it as a unit immediately before concrete placement. The cage consists of longitudinal bars and lateral reinforcement (spiral reinforcement, lateral ties, or horizontal bands). Tie spiral reinforcement or lateral ties to the longitudinal bars at each intersection, or as required for a stable cage. Ensure lateral reinforcement is not welded to longitudinal bars unless otherwise shown on the plans.
- Center the reinforcing steel in the precast formwork using approved centering devices unless otherwise approved. Support or hold the reinforcing steel to control displacement during concrete placement.
- Locate and tie anchor bolts when required before placement of concrete. Use templates or other devices to assure accurate placement of anchor bolts. Hold anchor bolt assembly rigidly in position during concrete placement.
- 3.5. **Concrete.** Perform all work in accordance with Item 420, "Concrete Substructures." Provide workable concrete and vibrate concrete as necessary to eliminate large air pockets, prevent honeycombing, and to provide a smooth form finish. Avoid over vibrating concrete which may cause aggregate segregation.
- Provide chamfer strip at the top surface of the foundation as shown on the drawings.
- Place concrete continuously for each foundation. Cold joints will not be allowed in the precast foundation.
- Cure the top surface and treat any construction joint area in accordance with Item 420, "Concrete Substructures."
- 3.6. **Foundation Installation** Ensure bottom of excavation is free of excess moisture prior to placing precast foundation and that soil/foundation interface is level. Place precast foundation as soon as possible after all excavation is complete.
- Verify orientation of the anchor bolt patten and conduits compared to the site requirements and construction drawings. Anchor bolts should be positioned so that the light fixture can be mounted with an orientation as shown on the plan sheets. Contractor will use necessary means of ensuring the anchor bolt orientation does not shift during backfilling activities
- Set shaft foundation while in a plumb orientation into final location and set unit to proper elevation (+/- 1/2 inch) of elevation specified on the construction drawings.
- Brace shaft foundation as required to maintain with level, true and plumb until backfill has been placed and cured.

- 3.7. **Backfilling.** Perform all work in accordance with Item 401, "Flowable Backfill." Place flowable fill uniformly around the perimeter of the shaft foundation to conduit bottom elevation and install below grade electrical connections. Finish flowable fill to the grade or as required on the contract plans.

4. **MEASUREMENT**

- 4.1. **Precast shaft foundations.** The precast shaft foundations will be measured by each structure.

5. **PAYMENT**

The unit prices bid for the various classifications of precast shaft foundations will be full compensation for excavation; furnishing, placing, and removing casing; furnishing and installing the precast foundations; backfilling and materials, tools, equipment, labor, and incidentals.