

Oregon Standard Specifications for Construction

2018

OREGON DEPARTMENT OF TRANSPORTATION
4040 FAIRVIEW INDUSTRIAL DRIVE SE
SALEM, OREGON 97302-1142

Section 00921 - Major Sign Support Drilled Shafts

Description

00921.00 Scope - This Work consists of excavating and constructing drilled, cast-in-place, reinforced concrete shafts for sign supports according to these Specifications and the Plans.

00921.01 Definitions:

Drilled Shafts - Reinforced concrete sections, cast-in-place against in situ Soil, Rock, or a casing.

Temporary Casing - Casing installed to facilitate drilled shaft construction only and removed during or after concrete placement.

00921.02 Subsurface Investigation - The Soils and Geological Exploration Logs are available for review through the Engineer's office. The data shown for each test boring or test pit applies only to that particular boring or test pit. Subsurface conditions may vary between borings or test pits. Core samples and laboratory test results, if obtained and performed for the Project, are available for review by contacting the Engineer.

The Foundation Data shown in the Plans is a compilation of pertinent information including, but not limited to, the Soils and Geological Exploration Logs.

Materials

00921.10 Materials - Furnish Materials meeting the following requirements:

(a) **Reinforcement** - Use reinforcement complying with Section 00530 and Section 02510.

(b) **Concrete** - Use Class 4000 drilled shaft concrete according to Section 02001, except as modified in this Section. Water may be added to the concrete mix at the Project Site only if allowed by the approved mix design.

00921.13 Steel Casing - Furnish temporary casing meeting the requirements of ASTM A252 or ASTM A36. Use casing of sufficient strength to resist handling, transportation and installation stresses and the external stresses of the subsurface materials. Ensure that the casing is clean and watertight prior to placement in the drilled shaft excavation.

00921.14 Drilling Slurry - Furnish drilling slurry meeting one of the following requirements:

(a) **Mineral Slurry** - Use mineral slurry meeting the following requirements:

Property	Test	Requirement
Density	Mud Density API * 13B-1, Section 1	64 - 75 lb./cu. ft.
Viscosity	Marsh Funnel and Cup API * 13B-1, Section 2.2	26 - 50 sec./qt.
pH	Glass Electrode, pH Meter, or pH Paper	8 - 11
Sand Content	Sand API * 13B-1, Section 5	4.0 % max.

* American Petroleum Institute

Maintain slurry temperature at 40 °F or more during testing.

00921.45

in the Contract. Do not proceed with shaft construction until the bottom cleanliness requirements have been met and the bottom (shaft tip) elevation is approved.

00921.45 Reinforcing Steel - Furnish and place reinforcing steel as shown and according to the following:

(a) Placement - Do not place reinforcing steel in the shaft excavation until the Engineer has approved the final elevation of the bottom of the shaft.

In each shaft, place reinforcing steel to the top elevation shown. Support the reinforcing cage to prevent distortion or settlement during concrete placement. Support the reinforcing cage such that the supporting mechanism does not obstruct the center of the shaft and allows concrete placement vertically down the center of the shaft. If concrete placement does not immediately follow cage placement, remove the reinforcing cage from the excavation and rectify the integrity of the excavation prior to reinstallation of the cage.

(b) Bracing - Rigidly brace the reinforcing cage to retain its shape for lifting. Lift the cage in a manner that does not cause permanent racking or distortion. Show bracing and any extra reinforcing steel required for fabrication of the cage on the submitted shop drawings. Remove cross bracing during cage placement unless otherwise approved.

(c) Splicing - Splice all drilled shaft reinforcement using approved mechanical splicer's unless otherwise shown or approved.

(d) Concrete Cover - Maintain the required concrete cover shown by placing concentric spacer bars or other approved devices around the reinforcing cage. Place spacing devices on minimum 10 foot vertical spacings the full length of the shaft. At each 10 foot level, place spacers on a minimum 30 inch circumferential spacing with at least three spaces per level. Do not use wood spacers or concrete dobies. Provide details of the proposed centering method on the shop drawings submitted according to 00921.40.

00921.46 Crosshole Sonic Log Test Access Tubes - Furnish and install access tubes for CSL testing as shown. Attach CSL access tubes securely to the interior of the reinforcement cage as near to parallel as possible in each drilled shaft and in the pattern shown. Extend the access tubes from the bottom of the reinforcement cage to at least 24 inches above the top of the shaft. Joints required to achieve full-length access tubes shall be watertight. Do not damage the access tubes during reinforcement cage installation and concrete placement. Fill the tubes with potable water, according to 02020.10(b), as soon as possible, but no more than 1 hour after concrete placement and reinstall the top watertight caps. Check water level and top off as needed.

Replace all access tubes that the test probe cannot pass through to the full depth of the shaft at no additional cost to the Agency. Replace all damaged access tubes with 1.5 to 2.0 inch diameter holes cored through the concrete for the entire length of the shaft. Unless otherwise directed, locate replacement core holes approximately 6 inches inside the reinforcement. Do not damage the shaft reinforcement during coring operations.

Fill the access tubes with grout only after all CSL testing has been completed and the shaft has been accepted.

00921.47 Concrete - Furnish and place concrete according to the following:

(a) Concrete Placement - Place concrete immediately after completion of the shaft excavation and with the approval of the Engineer. Prior to concrete placement, ensure the shaft clean-out requirements are met according to 00921.43(h) and the properties of the slurry, if used, conform