ALASKA

DEPARTMENT OF TRANSPORTATION

AND

PUBLIC FACILITIES

STANDARD SPECIFICATIONS

FOR

HIGHWAY CONSTRUCTION

2017 Edition

SECTION 515
DRILLED SHAFTS

515-1.01 DESCRIPTION. Construct drilled shaft foundations where indicated in the plans. This work includes all labor, materials, equipment, incidentals and services necessary to perform all operations to complete drilled shaft installation.

515-1.02 QUALITY CONTROL. Provide a Quality Control Inspector to ensure that all materials, techniques and methods are suitable to meet or exceed the minimum requirements of the contract.

The Quality Control Inspector shall submit daily reports during drilled shaft installation and testing operations verifying the Contractor's compliance with requirements of the contract. Include field measurement data, procedural discrepancies, installation problems, names of personnel, equipment usage data, and all other significant information in the daily reports.

515-1.03 QUALIFICATIONS. Experience is required for constructing drilled shafts of at least 8 feet in diameter and lengths similar to those indicated on the plans for three separate projects during the previous 5 years. Experience must include drilling in deep water (greater than 30 feet), drilling in soils with ground water, in soils with large boulders, and in rock.

515-1.04 GENERAL REQUIREMENTS AND SUBMITTALS. Submit the following documents for review and approval no more than one week after the Notice to Proceed:

1. Project Experience. Provide a list of three drilled shaft projects performed by the Drilled Shaft Contractor that involved drilling in sand, gravel, large boulders and rock similar to those conditions expected at this project location. Provide the drilled shaft plans, logs of test holes, dates of work, type of work, description of work, and amount of work performed. Provide the name and telephone number of a contact person at the agency or company for which the work was completed.

2. Personnel Experience. Provide a list of the key personnel involved in the drilled shaft construction. Include the name of the superintendent and of the superintendent's assistants who will be performing and directing the actual drilling operations. Include a resume of each superintendent and assistant involved in drilled shaft construction indicating:

   a. A minimum of 5 years' experience in directing drilled shaft construction of which 2 years being in responsible charge or operating equipment proposed for this project.

   b. The number of years of recent continuous relevant experience in performing similar drilling operations and operating the contractor proposed equipment for this job.

   c. Detailed recent relevant experience (three project minimum) including project description, date of work, actual work performed by individual, and a reference for each project including telephone number.

   d. A list of relevant equipment operated including type of equipment and amount and nature of experience.

   Only those personnel approved by the Engineer may work on the drilled shaft construction. The Engineer may suspend the drilled shaft work if the Contractor substitutes unauthorized personnel for authorized personnel during construction. If work is suspended due to unauthorized substitution of personnel, the Contractor shall be fully liable for all additional costs resulting from the suspension of work and no adjustment in contract time will be allowed.

1. Dimensions and Alignment. Provide equipment for checking the dimensions and alignment of each shaft excavation. Verify the dimensions and alignment of the shaft excavation under the observation and approval of the Engineer. Check the following:

   Shaft excavation dimensions and alignment.

   Casing dimensions and alignment periodically throughout the installation process.

   Casing dimension and alignment in final position.

2. Depth. Reference the depth of the shaft during drilling using marks on the Kelly bar or other suitable methods. Measure final shaft depths with a suitable weighted tape or other approved methods after final cleaning.

3. Shaft Cleanliness Requirements. Clean the shaft so that at least 50 percent of the base of each shaft has less than 3/4 inch of sediment at the time of concrete placement. Ensure that the maximum depth of sedimentary deposits or other debris does not exceed 1½ inches at any location on the bottom of the excavation. The Engineer will approve shaft cleanliness based on visual inspection for dry shafts. The Engineer will approve shaft cleanliness using divers, Shaft Inspection Device (SID) or other appropriate methods for wet shafts.

4. Casing. Visually inspect casings above water. Use a SID, diver, or other methods as directed by the Engineer to examine the casings below water for defects.

515-3.07 REINFORCING STEEL CONSTRUCTION AND PLACEMENT.

1. Reinforcement Cage Construction and Placement. Tie all intersections of drilled shaft reinforcing steel with cross ties or "figure 8" ties. Use double strand ties or ties with larger tie wire when necessary. The Engineer will give final approval of the cage construction subject to satisfactory performance in the field.

   Assemble and place as a single unit the cage of reinforcing steel consisting of; longitudinal bars, ties, spirals, cage stiffener bars, CSL tubes and all other components. Place the cage immediately after the Engineer inspects and accepts the shaft excavation and immediately prior to placing concrete. The Engineer will give final approval of the placement subject to satisfactory performance in the field.

2. Splicing Reinforcement Cage. If the bottom of the constructed shaft elevation is lower than the bottom of the shaft elevation in the plans, extend a minimum of one half of the longitudinal bars required in the lower portion of the shaft the additional length. Continue the tie bars throughout the extra depth and extend the stiffener bars to the final depth. Splice the longitudinal bar extensions as required.

3. Support, Alignment, and Tolerance. Tie and support the reinforcing steel in the shaft so that the reinforcing steel will remain within allowable tolerances as specified in Section 515-3.10.

   Use concrete wheels or other approved, non-corrosive spacing devices near the bottom and at intervals not exceeding 15 feet up the shaft to ensure concentric spacing for the entire length of the cage. Do not use block or wire type spacers. Use a minimum of one spacer for each 30 inches of cage circumference.

   Provide concrete or other Engineer-approved spacers at the bottom of the drilled shaft reinforcing cage. Maintain the specified distance between the bottom of the cage and the bottom of the shaft. Use one spacer per longitudinal bar unless otherwise approved by the Engineer. Use spacers sized to prevent vertical movement of the cage. Use spacers constructed of material equal in quality and durability to the shaft concrete. Submit spacer information for approval.