

**OKLAHOMA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION
FOR
PULSE-ECHO TESTING OF DRILLED SHAFTS**

These special provisions amend and where in conflict, supersede applicable sections of the 2009 Standard Specifications for Highway Construction, English and Metric.

516.01 DESCRIPTION

Conduct low strain impact integrity testing using the Pulse-Echo (sonic-echo) Test method on each complete drilled shaft on the project.

516.04 CONSTRUCTION METHODS

Conduct Pulse-Echo Tests in accordance with ASTM D 5882-07. Pulse-Echo Testing will be conducted by a Nondestructive Testing (NDT) consultant having no less than one year of experience in field operations and analysis of Pulse-Echo Testing of deep foundations. Submit the resumés of the testing consultant's personnel to the Engineer for approval before beginning any testing. Perform Pulse-Echo Testing no earlier than seven (7) days after placement of the concrete in the drilled shaft. If the concrete has achieved at least 75% of its design strength the Pulse-Echo Testing may be conducted earlier. Submit a preliminary report to the Engineer within 72 hours of the Pulse-Echo Testing. Submit to the Engineer two copies of the final Pulse-Echo Testing report, sealed by the professional engineer supervising the testing, within ten (10) days of the testing. Prepare the report in accordance with Section 7.1.5 of ASTM D 5882-07. The Engineer will evaluate the Pulse-Echo Test results and determine whether the drilled shaft construction is acceptable.

The Engineer may require continuous coring of the shaft using an "NW" size core barrel, as specified in ASTM D 2113, if a drilled shaft is believed to be unacceptable. The number, depth and location of cores will be determined by the Engineer. Submit the methods and equipment used to core the drilled shaft and grout the cored hole to the Engineer for approval before beginning any coring. Place the cores in a crate, properly marked, showing the shaft depth at each interval of core recovery. Submit the cores and an accurate log for each core recovered to the Engineer. Do not continue construction above the drilled shaft in question until the quality of the concrete in the shaft, as represented by the core samples, is determined to be acceptable and notification to continue construction is given by the Engineer.

A drilled shaft will be considered defective if the quality of the concrete in the drilled shaft is determined to be unacceptable. Correct defective shafts using approved methods. Submit a plan for the corrective work to the Engineer for approval. Corrective action may consist of, but is not limited to, the following:

- Removing the shaft concrete and extending the shaft deeper to compensate for loss of frictional capacity in the cased zone when temporary casing cannot be removed.
- Providing straddle shafts to compensate for capacity loss.
- Providing a replacement shaft.

516.05 METHOD OF MEASUREMENT

Measurement of Pulse-Echo Testing will be determined as the number of drilled shafts in which the test is successfully performed.

516.06 BASIS OF PAYMENT

The accepted quantities measured as provided above, will be paid for at the contract unit price for:

Pay Item:	Pay Unit:
<i>PULSE-ECHO TESTING</i>	Each

Payment will be full compensation for the labor and equipment necessary to complete the Pulse-Echo Testing on the completed drilled shafts, including the cost of all consulting services, testing equipment, materials, labor, equipment and incidentals.

Additional Pulse-Echo Testing, or any coring of a suspect drilled shaft necessary to determine the extent of defects in the drilled shaft will not be measured for payment.

Additional work required to correct a defective drilled shaft, including materials, labor, equipment, and incidentals will not be measured for payment.