

EXPECTED IMPLEMENTATION JULY 2016

455 STRUCTURES FOUNDATIONS. **(REV 1-8-16) (FA 1-14-16) (7-16)**

ARTICLE 455-43 is deleted and the following substituted:

455-43 Testing Cement Grout.

Prepare three 4 inches x 8 inches cylinders in accordance with ASTM C31, except pour grout in a single lift into cylinders molds without rodding, for each LOT. Plastic properties in accordance with ASTM C31 are not required. A LOT is defined as the lesser of 50 cubic yards of cement grout placed or one day of pile placement. Prepare one additional “hold” cylinder on the lot that is selected by the Engineer for Verification. Provide curing facilities for all QC and Verification test cylinders in accordance with ASTM C31. Test the cylinders at 28 days, in accordance with ASTM C39.

When one of the three QC cylinders from a LOT is lost, missing, damaged or destroyed, determination of compressive strength will be made by averaging the remaining two cylinders. If more than one QC cylinder from a LOT is lost, missing, damaged or destroyed, core the structure at no additional expense to the Department to determine the compressive strength. Acceptance of LOT may be based on verification data at the discretion of the Engineer. Obtain the approval of the Engineer to core, and of the core location prior to coring. Repair core holes after samples are taken with a product meeting the approval of the Engineer, at no additional cost to the Department.

For each QC cylinder that is lost, missing, damaged or destroyed, payment for that LOT will be reduced by \$750.00 per 1,000 psi of the specified design strength [Example: loss of two auger cast pile grout QC cylinders that have no verification data will require the element to be cored and a pay reduction will be assessed $(5,500 \text{ psi} / 1,000 \text{ psi}) \times \$750 \times 2 = \$8,250$]. This reduction will be in addition to any pay adjustment for low strength.

The Engineer will also cast three verification cylinders and one “hold” cylinder from one of every four consecutive lots, randomly selected. The Engineer will compare QC and Verification results in accordance with Section 346. If the results do not compare, the Engineer will initiate a Resolution Investigation in accordance with Section 346

Personnel making/curing concrete cylinders shall be certified as ACI Concrete Field Testing Technician Grade I. Personnel performing tests on hardened properties of concrete, such as strength determination of cylinders or beams, they shall be certified as ACI Concrete Strength Testing Technician.

All low strength cement grout accepted by the Engineer will be subject to reduced payment as follows: \$0.80 per cubic yard for each 10 psi of strength test value below the specified minimum strength. The Engineer will use the average compressive strength of the LOT tests for the computation of this pay reduction.

The Engineer will compute the volume of grout for which the reduction will be applied as 115% of the theoretical volume of the auger cast pile diameter required in the Contract Documents. Reduction in pay will be applied to the entire length of all piles containing low strength cement grout, in any quantity. The quantity of cement grout affected by the price reduction may exceed the quantity of cement grout contained in the LOT.

When separate payment for auger grouted piles is provided, the dollar reduction will be equated to an equivalent length of pile not to exceed the total pile length constructed utilizing the subject LOT based on the following formula:

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$$PLR = RC/UC$$

Where: PLR = Equivalent Pile Length Reduction in feet

RC = Total Reduction in payment, dollars

UC = Unit Cost of pile, dollars /foot

When a cement grout acceptance strength test falls more than 500 psi below the specified minimum strength perform one of the following:

1. Remove and replace the cement grout represented by the LOT in question at no additional cost to the Department; or,

2. Submit a structural analysis performed by the Contractor's Engineer of Record. If the results of the analysis, approved by the Department, indicate adequate strength to serve the intended purpose with adequate durability, the concrete may remain in place.

Otherwise, remove and replace the LOT of concrete in question at no additional cost to the Department.