

Evaluation of Capping Systems for High Strength Concrete Cylinders

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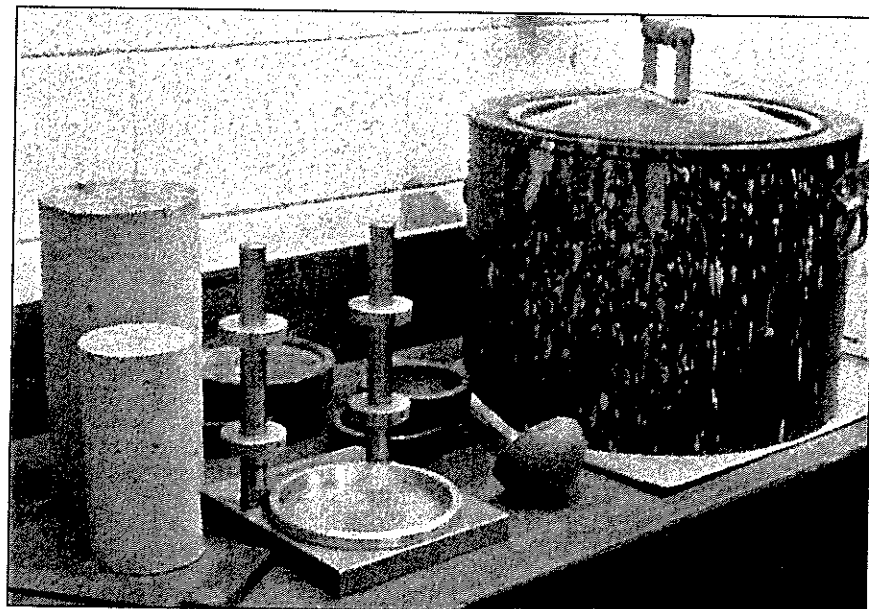
Problem

High-strength (> 6,000 psi) concrete is more sensitive to testing variables than normal-strength (3,000 psi) concrete. The end conditions of the specimens to be tested are paramount among these variables.

When testing concrete cylinders in compression, the ends of the specimen must be planar within 0.002 inches. If this condition is not met, ASTM C39 requires that the ends be either saw-cut or ground, which is sometimes difficult due to lack of available equipment. Another option is to cap the ends of the specimen. Several capping options exist.

Objective

This research will focus on evaluating different concrete cylinder end conditions for compressive strength testing. The cylinder end conditions that will be studied include unbonded neoprene pads and four different sulfur-based capping compounds. These end conditions will be compared to control specimens with ground ends.



Typical cylinder capping equipment



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Description

To conduct appropriate statistical analyses, it is proposed that at least 15 concrete cylinders be tested for each end condition being studied. The cylinders will be tested for compressive strength in accordance with ASTM C39.

Five strength levels of concrete mixtures will be prepared, ranging from 6,000 psi to 14,000 psi. Five concrete batches will be prepared for each strength level. With six end conditions to be evaluated (unbonded neoprene pads, four capping compounds, ground ends for control specimens) and three cylinders for each end condition, a minimum of 450 concrete cylinders will be tested during this study. To keep variations between batches from affecting one particular end condition, test specimens will be distributed among the various end conditions.

Implementation Potential

The findings of this study will be used by DOTD to update specifications and test procedures for quality assurance of high-strength concrete.