Research Need for Construction Technical Advisory Group

Effective/Updated: August 14, 2015

ISSUE: Concrete Specimen Strength versus In-Place Concrete Strength

SUMMARY OF PROBLEM: It is well known that concrete strength is influenced by temperature. However, the temperature obtained in a concrete test specimen will be much different than the concrete temperature obtained in a concrete patch or structural member. The slower strength gain from test specimens is a result of the small mass volume and corresponding lower heat generated. The slower strength gain will delay when a road can be opened to traffic if patching is being performed, or when a structure can be loaded if accelerated construction is desired. Florida DOT has done some research (“Long-Life Slab Replacement Concrete” FDOT Contract Number: BDV25-977-01) using an insulated cooler and a heavily insulated foam cooler to provide better retention of heat in strength specimens. The research showed strength specimens broke higher when cylinders were cured in the coolers when compared with ambient air cured strength specimens.

EXPECTED IMPLEMENTABLE OUTCOME: To provide early-age concrete strength test results that are more representative of in-place concrete strength.

To submit a research idea for consideration at the spring 2016 Executive Committee meeting, prepare and submit a Proposed Research Idea form to IDOT (DOT.BMPR.RESEARCH@illinois.gov) no later than October 1, 2015.