

RESEARCH PROBLEM STATEMENT

DATE: 09/23/2020	PROJECT AREA: Construction
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TITLE: Maturity Meters for Monitoring Concrete Maturity

PROBLEM STATEMENT:

The rate at which concrete cures can be unpredictable at times. ARDOT specifications eliminate some of the unpredictability by requiring samples of the mix to be taken on site; from these sample batches, cylinders are produced, cured, and transported to the lab for compressive strength testing. This testing determines when the new concrete can begin to take load, as well as if the concrete will reach it's required ultimate compressive strength.

With maturity meters, a sensor is embedded in the concrete and the maturity of the concrete (compressive strength and moisture) is monitored via a smart phone, tablet, or other digital device within a certain range of the sensor. These devices would ideally eliminate the need for on-site sampling and compression testing of concrete being used on jobs in the future.

OBJECTIVES:

In order for the maturity meters to work as designed, there is a cumbersome calibration process. An objective of the project would be to calibrate the system using common mix designs used in Arkansas for different types of concrete applications. After the system is properly calibrated, the next objective would be to ensure that real time data being provided is accurate. The third objective would be to leave a system in place that allows for new mix designs to be tested and incorporated into the system on an ongoing basis.

FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:

From being able to see the exact time when the concrete has reached a compressive strength adequate for traffic to eliminating the need for extra sampling and testing, implementing this technology could speed up the construction process in many ways. The ease of use and accessibility of the data would also benefit the contractors and project managers alike. There is also a cost savings aspect due to the elimination of compressive strength testing and sampling of cylinders obtained on-site.

Estimated Project Duration: 24 Months

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Standing Subcommittee Ranking	Advisory Council Ranking	Statement Combined with Statement Number(s)
<u>2/2</u>	<u>24</u>	<u> </u>