

PROBLEM STATEMENT

In the interest of improving durability and reducing construction costs, a number of state departments of transportation have adopted specifications allowing for portland cement concrete (PCC) pavement mixtures with a lower cementitious materials content (CMC) than the minimum of 565 lbs/yd³ currently required under Wisconsin Department of Transportation (Wisdom) specifications. In many cases other states have adopted these specifications without rigorous examination to verify the long term durability of PCC mixtures made with a reduced CMC. Wisdom would like to evaluate the possibility of adopting similar specifications. However, the agency currently does not have data based upon local materials to identify to what extent CMC can be reduced for a pavement mixture serving in a freeze/thaw environment without detrimental reduction in long term durability.

RESEARCH OBJECTIVES

The objectives of this proposed research project are:

1. Recommended values for revised minimum CMC to be used by Wisdom for future pavement mixes
2. Recommendations to Wisdom for future work in this area

BACKGROUND AND SIGNIFICANCE OF WORK

As stated in the RFP, to improve durability and reduce construction costs, many states have adopted specifications allowing for concrete pavement mixtures with a lower CMC than the minimum of 565 lbs/yd³ currently required under Wisdom specifications. The benefits of reducing the CMC in PCC mixtures include a reduction in cracking through reduced shrinkage and a reduction in concrete permeability while reducing the cost of the mixture. The concerns typically focus on possible strength reductions associated with a reduced CMC, and possibly a reduction in the freeze-thaw durability of the mixture.