

TECHNICAL REPORT TITLE PAGE

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Blended Cement Patching Research

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8. ABSTRACT

With the recent introduction of blended cements, many ready mix producers are using them as their sole source of cement. Iowa DOT specifications currently do not allow blended cements in patching due to their assumed slower strength gain. Patching specifications require opening at 5 hours on 2-lane or 10 hours on 4-lane pavement.

This research will investigate early strength of concrete cast with ordinary Type I/II Portland cements and Type I(SM) blended Portland cements.

The conclusions of this research are as follows:

1. Obtaining opening strength (5-hour patch) using Type I(SM) cement may be achieved by either 1) allowing one-half hour to one hour longer cure time, depending on ambient temperature or 2) using an increased dosage of mid range water reducer to achieve a lower w/c ratio.
2. Adequate strength is reached at 10 hours when Type I/II or Type I(SM) cements are used.

The following recommendations are based on conclusions from this research:

1. Allow use of Type I(SM) cement for 5 hour patches provided a Type A mid range water reducer is used at a higher rate to achieve a reduction in w/c ratio of at least 0.02 over the same mix with Type I or I/II cement.
2. Allow use of Type I(SM) for 10 hour patches without fly ash replacement.
3. Require longer curing time of at least 6 hours when Type I(SM) is used for patching when ambient temperatures are below 55 °F.
4. Require use of a Type A water reducer for all patching.

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