

**FREEZING AND THAWING DURABILITY OF CONCRETE - A
DEMONSTRATION PROJECT IN WISCONSIN**

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ABSTRACT

A demonstration project was conducted to evaluate freezing and thawing durability of structural grade, paving quality, concrete. A reference mixture established by WI-DOT and manufactured by a local concrete producer was used for this project. The reference mixture was proportioned to have a 28-day compressive of 4000 psi. The reference mixture was composed 565 lb/yd³ cement, 300 lb/yd³ water, 1270 lb/yd³ sand, and 1910 lb/yd³ coarse aggregate. Two other fly ash mixtures differing only in cementitious materials content were also proportioned. One of the fly ash mixtures contained 480 lb/yd³ cement and 110 lb/yd³ fly ash, and the other contained 450 lb/yd³ cement and 140 lb/yd³ fly ash. This report contains information about mixture proportioning data and test specimens for compressive strength and freezing and thawing tests. However, only the test data for compressive strength and penetration of chloride ions data are included in this report. The freezing and thawing tests data are presented elsewhere (CBU-1991-09). The control mix and 140 lb fly ash concrete performed equivalently during freezing and thawing cycles. The 110 lb fly ash mixture performed poorly after 300 cycles of freezing and thawing, primarily because of high amount of chert particles present in the aggregate source utilized.