AGGREGATE & READY MIX
ASSOCIATION OF MINNESOTA

MnROAD tests fiber reinforcement for concrete


Photo credit: Bill Jones

MnDOT IS TESTING HOW FIBER REINFORCEMENT CAN IMPROVE CONCRETE PERFORMANCE AND SAVE MONEY

Project description

Increasing budget constraints are compelling the Minnesota Department of Transportation (MnDOT) to explore whether fiber-reinforced concrete can help reduce the thickness and cost of concrete pavement while improving its performance. Past research demonstrated definite limits to reducing pavement thickness and also, that fibers have improved pavement performance.

In June 2017, the agency initiated a four-year study at its MnROAD outdoor pavement research facility to determine

1) how fibers can help reduce panel fatigue cracking
2) how fibers can help mitigate joint faulting, and
3) what the optimal panel size is for designs that incorporate fibers.

MnDOT is testing variables like panel thickness, type of base support, panel size and fiber dosage. Nine test panels use Forta-Ferro® macrofibers; the 10th one does not use fiber reinforcement. Sensors were installed in the concrete to monitor the pavement performance over time.

This study is a joint project of MnDOT and the National Road Research Alliance (NRRA). Nationally, states want to get a better understanding of the beneficial use of fibers in concrete pavement.

Project dates

June 2017 - June 2021

Project details

- There are six mainline sections that are 5” thick and four low volume road sections that vary from 3” to 5” inches thick. City streets are an example of low volume roads.
- Approximately 2,000 lbs of Forta-Ferro® fibers were mixed into the ready mix concrete.

Team

Owner: Minnesota Department of Transportation
MnROAD project manager: Martin Roach, transportation specialist
Concrete contractor: C.S. McCrossan
Ready Mix Concrete Producer: Aggregate Industries
Fibers supplier: Enduracon Technologies