



Mixing Strength With Satisfaction

## NATIONAL RESEARCH COUNCIL OF CANADA, OTTAWA, ON

### MS SELF-CONSOLIDATING CONCRETE

<b>PROJECT:</b>	National Research Council of Canada / M.T.O - Field Evaluation Renfrew, ON
<b>CONTRACTOR:</b>	Groupe Lefebvre St-Eustache, Quebec
<b>PRODUCT:</b>	MS Self-Consolidating Concrete
<b>QUANTITY:</b>	10 m <sup>3</sup> (350 ft <sup>3</sup> )
<b>COMPLETION:</b>	Fall 1999

The National Research Council of Canada (N.R.C.) approached King Packaged Materials Company about participation in a field study in which we would have the opportunity to conduct an extensive evaluation of our newly developed MS Self-Consolidating Concrete. The product is an air-entrained, silica fume enhanced concrete mix providing unique flowable plastic properties at a low water cement ratio without segregation.

N.R.C. provided a section of an M.T.O. bridge (Hwy 17 / C.N.R. Bridge, East of Renfrew) to KING in order to conduct the evaluation. Sections of the north and south barrier walls were severely deteriorated from over 25 years of exposure to chloride contamination that resulted in corrosion. These conditions are representative of typical environmental conditions in Ontario. Damaged concrete was removed from sections of both the north and south walls and the structure was prepared following normal M.T.O. guidelines.

KING chose to use specially designed forms with plexiglass windows in order to observe the behaviour of the MS Self-Consolidating Concrete as it was poured in place. The unique properties of this product were evident when material completely filled the forms encapsulating the structural steel without mechanical vibration.

To further evaluate the long-term performance of the repair and the deterioration mechanisms, embedded instrumentation was used to remotely monitor the condition of the rehabilitated barrier wall over a 5 year period. Approximately 90 different sensors were installed in the old concrete and the vicinity of the instrumented patch.

M.T.O. and N.R.C. personnel were able to observe, through the plexiglass windows, MS Self-Consolidating Concrete flow along the 6 m (20 ft) length of the repaired area and around the structural steel. The initial report from the N.R.C. has indicated that MS Self-Consolidating Concrete

has exceeded the performance expectations and has resulted in approval of the product for use on M.T.O. structures.

