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**Title:** Trenchless Culvert Repairs Under Active, Remote Railways

**Theme:** Trenchless Design and Construction

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**Abstract:** "Canadian National Railway (CN), Canada's largest railway and only transcontinental railway, with significant trackage in the central United States along the Mississippi River valley as well, has a substantial amount of track to maintain, along with the culverts that run underneath them.

Much of this maintenance and rehabilitation must be performed in remote areas, under active track, with limited accessibility, and varying weather conditions.

CN recently commissioned MuddRuckers Concrete Leveling & Lifting, of Winnipeg, Manitoba, to complete two pilot projects in 2014 and 2015 to test a trenchless culvert rehabilitation solution they had not previously used. This method of applying a structurally sound centrifugally cast concrete pipe is well suited to situations requiring limited staging, no-dig culvert repairs.

The two projects were similar, running directly under high-traffic rail, but each presenting their own challenges, with weather a primary variation.

The winter project, near Fairmount Road, was completed first in January 2014, with temperatures of -20°C (4°F). Heaters were installed to thaw ice for dewatering and for successful application and curing of the centrifugally cast concrete within the twin 36" diameter CMP culverts

The summer project, near Wilkes Avenue, rehabilitated a considerably deteriorated 42" diameter pipe, 85 feet in length, running underneath the track and several miles from the nearest railroad crossing. After dewatering and repairing the invert, two passes on consecutive days applied a total thickness of one inch to structurally repair the failing culvert.