

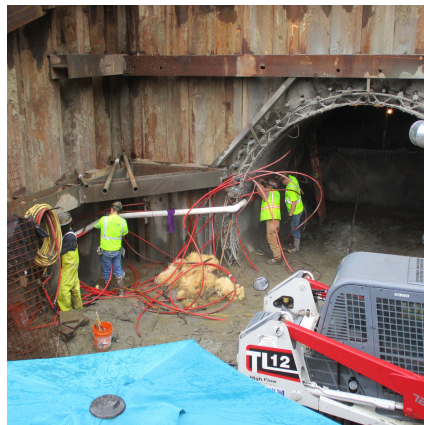
## I-89 Culvert Improvements

Georgia, VT



### PROJECT OVERVIEW AND CHALLENGES

Bradshaw completed construction of two storm drain tunnels under Interstate 89 to replace the failing 72 inch CMP stream culverts. The total excavation was 20.5' wide x 13.5' high horseshoe tunnel. The lengths were 136 and 100 feet. The finished inner diameter of the precast culverts were 15' wide x 8.5' high. The tunnels were constructed using the sequential excavation method (SEM) consisting of reinforced shotcrete initial tunnel support. The project is a design-build collaboration for Vermont Department of Transportation. Bradshaw submitted the SEM as an alternative technical concept and it was accepted by VTRANS in-lieu of a jacked concrete box (base technical concept). Subsurface conditions consisted of marine silts, sands, clays and buried trees. Vacuum dewatering was used to control groundwater inflows during tunneling. The D/B team consisted of J.A. McDonald, Bradshaw, & Stantec.



### PROJECT INFORMATION - 557

#### OWNER:

Vermont Agency of Transportation  
Resident Engineer  
Greg Wilcox  
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#### ENGINEER:

Stantec  
Greg Edwards  
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#### CONTRACTOR:

J.A. McDonald, Inc.

#### COMPLETION DATE:

9/9/2017

#### GEOLOGY:

Marine Silts, Sands, Clays & buried trees

#### EXCAVATION METHOD:

Hand Mine w/ Reinforced Shotcrete Support  
NATM/SEM

#### MINING DIMENSIONS:

100' & 136' x 20.5' W x 13.5' H Ø

#### FINAL LINING:

Cast-place-concrete & precast concrete

#### FOR MORE INFORMATION:

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Refer to Project 557