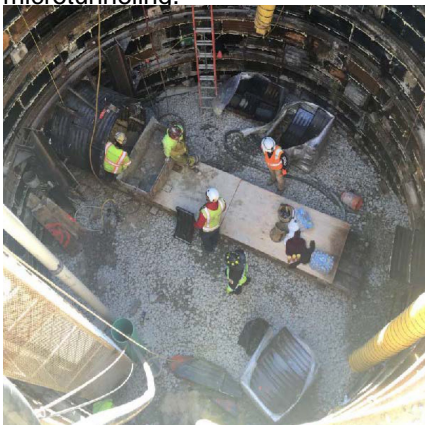


## CSX Transportation Howard St. Tunnel, Camden St. Drain Replacement Baltimore , MD



### PROJECT OVERVIEW AND CHALLENGES

Bradshaw completed this high profile project in downtown Baltimore, MD as part of a design-build team. An existing storm drain located in the invert of the Howard Street CSX Rail Tunnel had been the cause of frequent flooding. This project replaced that 48" storm drain with a larger, deeper siphon drain which eliminated the flooding and allows CSX to increase the depth of the existing tunnel to gain freight capacity through the area. A total of three tunnels were mined out of a 26' diameter by 55' deep shaft. The subsurface conditions consisted of poorly graded sand with silt and gravel, which required extensive grouting prior to tunnel excavation. The first was the Upper Adit Tunnel, 32' of 66" liner plate hand-mined for a 48" FRP storm drain. The second tunnel was 68' of 48" liner plate hand-mined for 18" PVC pipe, which will ultimately serve as the drain for the Howard Street Tunnel. The third tunnel consisted of 122' of 74" steel casing installed by microtunneling.



### PROJECT INFORMATION - 576

**OWNER:**

CSX Transportation  
904-359-3100

**ENGINEER:**

McMillen Jacobs Associates  
Joe Shrank  
615-490-9025  
shrank@mcmjac.com

**CONTRACTOR:**

Clark Construction Group, LLC

**COMPLETION DATE:**

5/19/2018

**GEOLOGY:**

Very Dense Alluvial Sand & Gravel

**EXCAVATION METHOD:**

Handmine

**MINING DIMENSIONS:**

100' x 48"-66" Ø

**FINAL LINING:**

48" Fiber Reinforced Pipe  
18" Polyvinyl Chloride Pipe

**FOR MORE INFORMATION:**

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Refer to Project 576