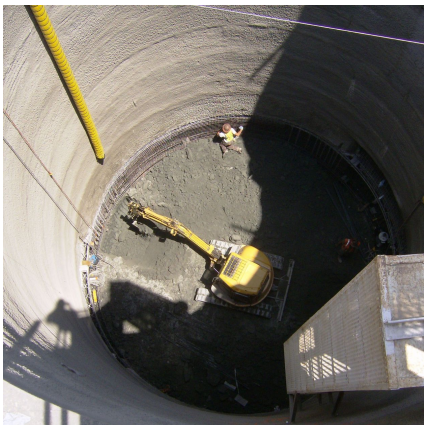


## Battery Park Trunk Sewer Tunnel Richmond, VA



### PROJECT OVERVIEW AND CHALLENGES

To resolve CSO flooding from a collapsed sewer for the City of Richmond, Bradshaw installed 4 tunnels from various drive and recovery shafts. These included the use of the New Austrian Tunnel Method (NATM – Sprayed reinforce shotcrete), steel sheet piling, steel rib and wood lagging, and trench box shafts. The all varied in depth up to 60' deep. The NATM shafts were 30' ID. The structures at tie-ins were installed in shallower but large steel sheeted shafts up to 20'x50'. The principal challenges installing these shafts were tying into the large existing sewers at the end of each tunnel, excavating solid waste from the City dump, and being exposed to flooding from the existing sewers.



### PROJECT INFORMATION - 457

#### OWNER:

City of Richmond  
Department of Public Utilities  
Robert Stone, Project Manager  
804-646-8557  
Robert.stone@richmondgov.com

#### ENGINEER:

Greeley & Hansen Engineers  
Kurt Stykemain  
804-355-9993  
kstykemain@greeley-hansen.com

#### CONTRACTOR:

Bradshaw Construction Corporation

#### CONTRACT VALUE:

\$23,698,300

#### COMPLETION DATE:

4/30/2008

#### GEOLOGY:

Miocene Clay, Solid Waste

#### EXCAVATION METHOD:

NATM, SP&L and R&B with track excavator

#### MINING DIMENSIONS:

30' Ø NATM + 30' Ø R&B + 20'x50'  
SP&L

#### FINAL LINING:

30' Ø NATM + 30' Ø R&B + 20'x50'  
SP&L

#### FOR MORE INFORMATION:

Todd Brown, Project Manager  
410-970-8300  
tbrown@bradshawcc.com  
Refer to Project 457