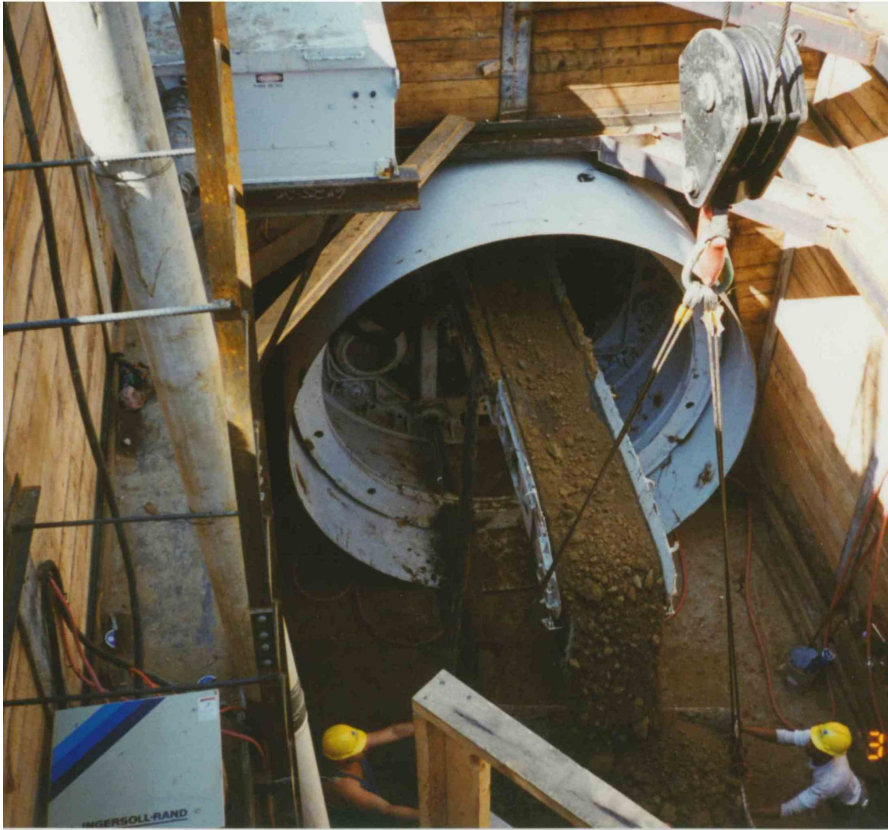
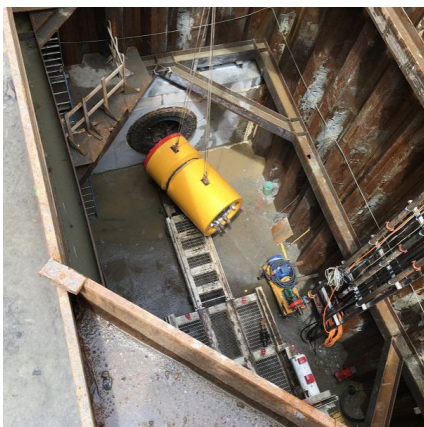


## Ruby Avenue Storm Sewer Extension Kansas City, KS



### PROJECT OVERVIEW AND CHALLENGES

Bradshaw Construction installed 1,665' of 143" O.D. steel rib and board tunnel for a 96" RCP storm sewer using a modified Lovat TBM. The tunnel was part of a 6,630' storm sewer project to alleviate flooding in the Argentine area of Kansas City, Kansas. Bradshaw also installed a soldier pile and wood lagging mining shaft that attached to an existing box culvert storm drain. The primary challenge on the project was the mixed face ground conditions. The tunnel started in fat clay, progressed into soft shale and finally into shale with limestone cap rock. Unexpectedly, the limestone exceeded 19,000 psi necessitating TBM modifications so that 6.5" rock disk cutters could be added underground as the tunnel was mined. This innovative solution proved to be highly effective and the project was completed on time and within budget.



### PROJECT INFORMATION - 273

**OWNER:**

City of Kansas City

**ENGINEER:**

Burns & McDonnell  
David Hauser, PE  
(816) 333-9400

**CONTRACTOR:**

Garney Construction

**COMPLETION DATE:**

2/15/1995

**GEOLOGY:**

Clay, Shale and Limestone

**EXCAVATION METHOD:**

143"Ø Lovat TBM

**MINING DIMENSIONS:**

1,665' x 143"Ø

**FINAL LINING:**

96" Reinforced Concrete Pipe

**FOR MORE INFORMATION:**

Lester M. Bradshaw, Jr., President  
(410) 970-8300  
Lester.Bradshaw@BradshawCC.com  
Refer to Project 273