

Liner Plate Rehabilitates Tunnel, Allows Park Trail to Remain Open



Jonathan Run - Ohiopyle State Park

Stewart Township, Pennsylvania - When the existing, 100 year old cast-in-place tunnel began to show signs of spalling, especially near the invert, a new structure was needed. The existing cast-in-place invert needed extensive repairs, so the Pennsylvania Department of Conservation and Natural Resources (DCNR) took the opportunity to reline the structure and make improvements to the inlet and outlet. This tunnel provides drainage of a small mountain stream, Jonathan Run, into the Youghiogheny River, a major spot for rafting and canoeing enthusiasts. Without the flow being controlled through this tunnel, severe flooding and eventual erosion and failure of the rail bed and trail was a certainty.

Originally, a train bed ran over the structure, but it was removed and converted to a pedestrian/bike trail with access for park vehicles as well. DCNR chose to rehabilitate the existing structure, rather than replace it, because it allowed the bike and pedestrian trail to remain fully open during construction. In addition, a complete replacement of the structure would have required clearing a large area of trees creating an undesirable impact to the surrounding area. Total replacement would have also meant excavating thousands of cubic yards of fill material to remove the existing culvert, installing a new culvert and then backfilling and compacting the fill material. Because of the steep mountainous hillsides surrounding the area of the bike trail, removal of this material was not considered an option because there was not a site nearby to stockpile this fill material while a new culvert was being constructed.

"Costs of installing a new culvert would have been considerably higher than rehabilitating the existing culvert," stated Edward Raptosh, Civil Engineer Manger with DCNR. "A combination of these factors and because so much of the park's visitation is attributed to the popularity and use of the rail trail, a rehab of the existing culvert was considered the most appropriate choice."

Due to the 80' of fill over the existing structure, accessibility to the culvert was difficult. A 5 gage, 2-flange galvanized steel 11' x 11'-7.5" Tunnel Liner Plate in a horseshoe arch shape was chosen for its cost effectiveness and ability to be delivered to the remote site. During the construction phase, the Tunnel Liner Plate was delivered to the jobsite as unassembled curved plates. These plates were then bolted together and installed, plate by plate, as the tunnel advanced.

WG Land Company, LLC of Champion, Pennsylvania, installed 219' of Tunnel Liner Plate. The structure was approximately 11' in diameter and provided enough waterway area to accommodate the drainage capacity for Jonathan Run during flood events.

Overall, the installation of the Liner Plate took one week with an additional three days allocated to grouting in order to meet lift requirements.

"DCNR considered the project a success and looks to complete other reline jobs, especially within the Ohiopyle State Park and its' Youghioghny Bike Trail," added Mr. Raptosh. "There are several other deteriorating culverts along this trail that will be considered for future reline projects due to the fact that their location, difficult site access and depth of overburden over the culvert is similar to the Jonathan Run Culvert."

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WG Land Company, LLC
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