



Pinkerton Tunnel Rehabilitation

OWNER	Somerset County Rails-To-Trails Association
DESIGNER	Gannett Fleming Inc. Pittsburgh, PA
CONTRACTOR	Geobuild, Columbus, OH
LOCATION	Southwestern Pennsylvania, USA

The Great Allegheny Passage (GAP) is one of the most picturesque converted rail-trails east of the Mississippi River. Connecting Washington D.C. to Pittsburgh, Pennsylvania this multi-use trail is enjoyed daily by bikers and hikers as it twists its way through the Appalachian Mountains. Near the town of Somerset, the busy trail took an abrupt turn to detour around the historic Pinkerton Rail Tunnel. The tunnel, originally built in 1911 to connect the former Western Maryland Rail-line to the bustling Pittsburgh region, was closed since the GAP trail opened in 1999. Much of the tunnel interior had cracked and spalled concrete walls and in some areas the roof had collapsed leaving large holes in the ceiling. In the fall of 2014, engineering consultants Gannett Fleming contacted Armtec for assistance to rehabilitate the 270m long concrete tunnel and eliminate the 2.5km detour around the failing structure.

Application:

Rehabilitation of the failing rail tunnel was required to re-open trail access. Armtec proposed an 8.3m span by 6.8m rise corrugated structural steel liner closely matching the interior dimensions of the existing tunnel wall.



TECHNICAL DETAILS

- Bridge-Plate two-radius arc
- Span: 8,300mm
- Rise: 6,810mm Length: 260m
- Length: 260m

The Challenge:

The rail tunnel measured approximately 260m from entrance to exit. The customer requested a design with no struts or supports to hold the plates in place until the grout was set. A liner plate design of this size would require struts. An alternative deep corrugated structural plate (DCSP) design would not require struts, however unlike liner plate it would require bolting on both sides of the structure.

Uneven deterioration within the tunnel caused its interior profile to vary significantly. The void space between the structural plate product and the existing tunnel also had to be minimized in order to reduce grouting costs.

The Solution:

Armtec’s engineering department designed a Bridge-Plate two-radius arch structure with an 8.3m span by 6.8m rise. In order to bolt the plates on both sides of the structure, 6m sections were pre-assembled and pulled into place along special slider plates set on the footings along the length of the tunnel. The 6m lengths of Bridge-Plate liner were then bolted together using a custom designed internal joining mechanism. Over 1,000 plates were used - the equivalent of almost three football fields in length.

In an effort to minimize the space between the concrete wall and the liner, Gannett Fleming laser measured the inside dimensions of the tunnel. Normal reline tolerances for structures of this size were 200 to 300mm. The consultant’s precise detailing was incorporated into Armtec’s manufacturing process resulting in a tolerance of less than 150mm. The precision production saved the customer an estimated \$300,000 in grout costs.

“Armtec proved to be an extremely competent, professional, and responsive partner throughout the design and construction schedule providing detailed shop drawings, technical support, timely fabrication and delivery, and construction oversight. It was our pleasure to have Armtec on the team, and we look forward to the opportunity to work together again.”

Robert H. Yauger, P.E., Gannett Fleming, Inc.



**Find out how Bridge-Plate can be used on your next project.
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