

Water Control-Pre-Cast Cut and Cover Culvert Sections  
Power Station- Western Pennsylvania

Challenge Faced:

A large fossil fuel power plant in the mountains of Western Pennsylvania has a 775 foot long transmission tunnel built in 1985, used to carry coal from the stockpile to the power plant across the road. This tunnel was constructed using the cut and cover method with pre-cast concrete culvert sections installed and tensioned appropriately. In addition to the coal conveyance equipment in the tunnel, it also carries extensive electrical work through metal conduits along its length. Tar strips were installed between sections as the water stop. Over time, the tar strips dried out and cracked, allowing ground water to infiltrate the joints and enter the tunnel. The water has caused the conduits to rust and the lack of floor drains has caused water to collect on the floor. The pre-cast sections are 11 inches thick and have interlocking joints. We were asked to restore the water tight integrity of the tunnel.



This is an example of the corrosion and rusting of the electrical conduit in the tunnel prior to injection.



This shows the proper depth to set the packer and also the discoloration & deterioration of the leaking tunnel.

### The Project:

While none of the leaks were particularly large by themselves, the length of the tunnel and the number of leaking joints resulted in quite a volume of water ingress. Due to that fact, we elected to use our Hyperflex material, a single component, pre-catalyzed, hydrophobic grout. Its extended reaction time allows it to flow all through the joint prior to reacting, giving the best possible seal. A converted airless paint sprayer and 5/8 inch injection packers were used to install the Hyperflex. The pre-cast sections were full of rebar, which added to the degree of difficulty in drilling holes to set the packers. Rebar, when hit, will stop a drill cold and many times there is no other choice but to start over and drill again. We intersected the joints about 6 inches or so from the face and injected the joint until a show of material was seen at the face of the joint. The tar strip only filled the first three inches or so of the joint so it served nicely to chink the joint and keep the Hyperflex where it belongs. Given the uniformity of the joint we were injecting it was only necessary to drill three holes in each, one in the ceiling and one each in the two walls.



This shows our Sr. project Manager injecting HyperFlex into the joint.



The Result:

The HyperFlex migrated around the perimeter of the pre-cast joint, expanding and filling it and any voids present out of sight on the other side of the wall. The customer was so happy with the work Sub-Technical did on the leaking joints that we were asked to come back and grout the rest as a preventative measure.



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