Customer case study

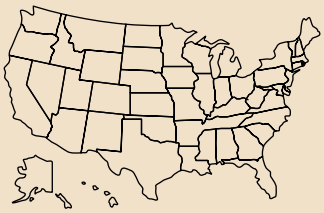
Pawtucket CSO Tunnel

Project specifications

Project type: Wastewater
Application: Steel fiber-reinforced precast concrete segments

Partners

Owner: Narragansett Bay Commission
Engineer of record: AECOM
Contractor: CBNA/Barletta Joint Venture



The deep rock Pawtucket Tunnel project will reduce combined sewer overflows (CSO) and protect New England's largest estuary, Narragansett Bay. This 30ft-(9m-) inside diameter tunnel is more than 2 miles (3.5km) long, mined by TBM through sandstone at depths of 140-180ft (42-54m). It's the third and final phase for the client's CSO Abatement Program.

The challenge

CSO tunnels are subjected to corrosion due to hydrogen sulphide attacks, especially when built with rebar reinforcement.

In addition, for the Pawtucket project, numerous adits connect to the tunnel along its alignment including one of 1,000ft-(305m-) length excavated by microtunnel.

The design called for specialized precast lining segments to support these breakout areas.

The solution

Bekaert supplied Dramix® 4D 80/60BG fibers for the tunnel's segmental liner, which is predominantly reinforced solely with steel fibres. These will better withstand the corrosive CSO fluids compared to traditional steel reinforcement bars.

In breakout areas, the contractor used hybrid tunnel lining segments with both fibers and bars, which provided the capacity required to carry additional loads when creating the adits. This also avoided disruptive changes to the precast process and optimized logistics in the tunnel.