Wet shotcrete process key to Ore. tunnel restoration

After 70 years of continuous vehicular traffic between Portland and the Columbia coast on Highway 26, the 772.9-foot Edward Tunnel was in need of significant structural restoration. However, renovating the tunnel could not interfere with the daily commute of thousands and had to be complete before traffic doubled when the tourist season began. To make the project more challenging: general contractor Johnson Western Concrete Co. faced wet weather and unstable ground conditions when the project started. This made the use of a traditional mix and shotcrete application system impossible, so a unique approach was taken to restore the tunnel.

Shotcrete was applied up to 15 in. thick between existing timbers sets as logging could be removed and reinforcement applied at a reduced time. This process enabled construction to be performed safely and efficiently throughout the night.

The QUIKRETE Cos. latest innovation, QUIKRETE Wet Process Shotcrete, was critical to the success of the award-winning Oregon Department of Transportation (ODOT) U.S. Highway 26 Denver L. Edwards Tunnel Project in Portland, Ore. More than 1,200 cubic yards of 0.600 slump 1550 Shore VIs Steel Fiber Reinforced was used in the tunnel renovation, which won named 2011 Outstanding Riprap & Rehabilitation Project by the American Shotcrete Association (ASA).

In addition to exceeding project strength specifications by reaching 3,000 psi at one day and more than 6,000 psi at 15 days, the wet process shotcrete limited dust in the application process by attaching the shotcrete wet in advance rather than combining the water and shotcrete during the spraying process. As a result, there was little clean-up and no maintenance for traffic and Johnson Western Concrete Co. completed the project on time.

"A combination of factors including the project schedule and traffic considerations made this a uniquely challenging restoration," said Dan Doche, regional sales manager for The QUIKRETE Cos. "However, with the wet mix process, the Johnson Western Concrete team experienced nearly no rebound and was able to methodically rehabilitate the tunnel in a timely manner without creating any traffic disruptions. This award from the Shotcrete Association really validates that the right approach was taken to restoring the tunnel."