

UNDERGROUND CONSTRUCTION II

Five2Watch

Manhattan's 7-line Subway Tunnel

The future 34th Street Station is taking shape as the cavern walls continue to be lined with cast-in-place concrete. Work is being staged to allow the tunnel-boring machine (TBM) mucking operation, removing excavated rock, to continue while the concrete is poured. The mezzanine-slab formwork, which is now in place, has been designed to allow the muck trains to pass beneath while the mezzanine slab is installed, allowing both to proceed simultaneously.



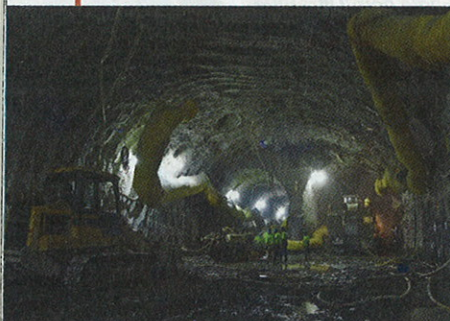
Following the breakthrough of the TBMs into the station cavern at the end of last year, both TBMs were pulled through to the starter tunnels at the north end of the station cavern where mining commenced. The

northernmost TBM has completed the turn from 11th Avenue to 41st Street and is now running east toward Times Square. The other TBM has passed under the Lincoln Tunnel and is mining the curved section leading to 41st Street.

University Link Light-Rail Progress

This is a \$309-million contract which includes twin 11,400-ft-long concrete segment lined tunnels and 16 cross passage tunnels with civil and structural work for the University of Washington Station. A joint venture of Traylor Bros., Inc. and Frontier Kemper Constructors, Inc., which won the contract in May 2009. Construction to date has consisted of preliminary site work including utility installation, excavation and access-road construction. Slurry-wall construction for the station box and TBM launch pit is slated to start in August 2010 with excavation for the box scheduled for an October 2010 start.

Tunnel equipment has been procured and is currently under fabrication. There will be two 22.5-ft-dia Herrenknecht earth-pressure-balance TBMs delivered to the site in March 2011 with tunneling to commence in June 2011.



Update on East Side Access

The huge and ambitious project to connect Long Island Rail Road (LIRR) to Grand Central Station in New York City progresses. Excavation of the tunnels

and caverns in Manhattan continues with both TBMs mining the lower level tunnels while Dragados-Judlau J.V. uses roadheader, drill-and-blast to carve out the caverns. In Queens under Granite Construction Northeast-Traylor Bros., Inc.-Frontier Kemper Constructors, Inc. J.V., a temporary vehicular access bridge was installed across the open-cut to facilitate safe movement in and around the excavation of the launch site of the soft ground TBMs. In the busy Sunnyside Yard area, numerous activities are proceeding under Perini Corp., including the installation of catenary poles, trenching and micro-tunneling in the frantic Harold Interlocking.

Californians Deciding Route of High-Speed Train

The Preliminary Alternatives Analysis for the San Francisco to San Jose portion of the rail system reconfirms that a four-track, grade-separated, shared Caltrain and high-speed train system is feasible and is the recommended alternative on the Peninsula.

The analysis found that this alignment—on, below and above grade—using the existing Caltrain right-of-way, would minimize environmental impacts and increase inter-city connectivity, while also improving the safety and reliability of Caltrain commuter service. The shared-track system would allow high-speed trains to operate at speeds up to 125 mph and Caltrain to operate at up to 110 mph.

Compressed-Air Storage in Salt Mine

Compressed-air storage for energy use (CAES) has been used intermittently since the 19th century, but is finding new employment in the U.S. In 2009 an electric utility, BSC Holding, Inc. (mine owner), and Segra Inc., a design engineering firm, entered an agreement to investigate feasibility of storing wind energy as compressed air in the Lyons Salt Mine in Kansas.

The test comprised isolating a cavern in the mine with a concrete bulkhead 25 ft wide, 17.5 ft high, and 16 ft deep, embedded into the salt surroundings. The final seal was a rubberized grout proprietary to and applied by Sovereign Hydroseal Pty Ltd. of Australia. A hydrostatic test with brine solution plus 20 cu ft of air was incrementally pressured to 50 psi, then 100, 390, and finally 1,220 psi, with no measurable pressure drop inside. The bulkhead moved forward 3/4 in. while pressing into the salt formation.

