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IMMEDIATE

Sandhogs Break Through Final Piece of Concrete, Joining LIRR's New Manhattan Tunnel to Its New Queens Tunnels

One Continuous Open Tunnel Now Extends from Sunnyside, Queens, to a Cavern Underneath Grand Central Terminal in Manhattan; Workers Have Frozen Ground and Lifted an Elevated Subway Line to Build Final Tunnel

Sandhogs working on the Metropolitan Transportation Authority's East Side Access megaproject – the largest transportation infrastructure construction project in the nation – today broke through the final piece of reinforced concrete separating newly built tunnels in Queens from newly built tunnels in Manhattan. In so doing, they created a continuous tunnel running more than 3½ miles from a cavern 12 stories underneath Grand Central Terminal to four concrete-lined, 22-foot diameter tunnels just feet below the Sunnyside rail yard in Queens that will soon be connected to the Long Island Rail Road main line.

"For the first time since the East Side Access project began, there is now a continuous path through newly built tunnel from Queens to the East Side of Manhattan," said MTA Chairman and CEO Joseph J. Lhota. "This is the path Long Island Rail Road trains will follow when this project is completed."

The connection between the Manhattan and Queens tunnels took place directly underneath Northern Boulevard in Long Island City, Queens. The contract to excavate this 120-foot segment of tunnel was handled separately from the other tunneling contracts because it presented a host of unique challenges.

Not only does this segment of tunnel need to bear the weight of Northern Boulevard, a busy 6-lane arterial truck route leading to the Ed Koch-Queensboro Bridge. It also needs to support the four-track IND subway trunk line underneath the roadway that carries the E, M and R subway trains, as well as that of the elevated BMT Astoria Line, which carries the N and Q subway trains.

Project workers had to drive a new set of foundation pilings into the ground to temporarily support the Astoria Line tracks and elevated structure during the construction of the tunnel. They then jacked up the line ever so slightly in order to relieve its permanent foundation supports of the line's weight, and shift the weight to the temporary supports. Then, they cut into the permanent foundation, which had been protruding into the right-of-way where the new tunnel is being built. In later phases of construction, workers will restore the subway line to its permanent foundation, which has been modified to rest on top of the newly completed section of LIRR tunnel. The tunnel has been engineered to carry the weight.

"This is the most complicated and challenging 120 feet of tunnel we've built on any of our construction megaprojects," said Dr. Michael Horodniceanu, President of MTA Capital Construction, the MTA agency that is building the East Side Access project, as well as the Second Avenue Subway, extension of the 7 subway line, and Lower Manhattan's Fulton Center. "That it is being completed as intended is a testament to human ingenuity and perseverance."

Because the ground is soft at this site and difficult to control during excavation, it has been frozen to allow for increased control and rigidity. In order to further ensure the continued stability of the nearby ground, the tunnel has been divided up into seven horizontal segments, or "drifts," which are arranged length-wise and stacked into three columns. Each frozen drift is being excavated separately, and the one completed today is the southernmost, top-most one.

The now interconnected continuous stretch of future LIRR tunnel consists of four main segments. Here are descriptions, from west to east.

- In Manhattan, crews began excavating caverns and tunnels in 2007. Two enormous tunnel boring machines worked between September 25, 2007, and June 10, 2011, to mine through 32,469 feet of the mica-inflected granite schist that is the bedrock of Manhattan.
- The segment that stretches under the East River and Roosevelt Island is the lower level of a tunnel that was built between November 24, 1969, and October 10, 1972. Its upper level carries the F subway line.
- The tunnel underneath Northern Boulevard, where workers today opened up a five-foot square hole in the end wall separating the tunnel from the adjacent tunnel to Manhattan. Work on this tunnel segment will continue. Workers will complete adjacent drifts in the coming weeks. Then they will break down the concrete walls separating the drifts from one another, thereby creating a single tunnel 60-feet wide and 40 feet high, capable of carrying three tracks. The outer tunnel walls will then be structurally reinforced and lined with concrete.
- In Queens, four sturdy concrete-lined tunnels have been built that will allow the future tracks to join up with the LIRR's Main Line. These tunnels were excavated through boulder-strewn soft ground under the Sunnyside Rail Yard using two tunnel boring machines that operated between May 17, 2011, and July 23, 2012.

The work to build the tunnel underneath Northern Boulevard is being performed by a joint venture of Schiavone Construction and Kiewit Corp. under a \$96.8 million contract. The MTA awarded the contract in February 2010. It is to be completed next April. The overall East Side Access project is scheduled to be completed in August 2019.

