The Plaza Substation and Queens Structures

Project Name: CQ32
Project Location: Queens, NY
Shotcrete Contractor: Superior Gunite
General Contractor: Tutor Perini Civil

Architect/Engineer: New York Metropolitan Transportation Authority Capital Construction (MTACC)
Material Supplier/Manufacturers: Ferrara Brothers Building Material and Teccrete
Lab: Tectonic

CQ32 is a four level ventilation facility, passenger station, and offices for the MTA. 5 other active projects are adjacent and or tie directly into the project making logistics a challenge.

The Plaza Substation and Queens Structures provides structural and architectural rehabilitation to existing facilities along existing 63rd St and will tie in from Long Island to the East Side Access project as a major hub station. Tunnel and construction of Plaza Interlocking below grade facilities for Mainline Traction Power Substation, Facility Power Substation, ventilation, signal, emergency power, mechanical, and communication rooms.

Superior Gunite, was assigned the task to install concrete on structural perimeter walls, interior I-beam walls, interior steel reinforced walls, and circular and square columns. The shotcrete process was used in varied thicknesses from 12 to 72 in (30.5 to 183 cm) depending on type of wall, and 24 in (61 cm) diameter circular columns. The base contract volume was approximately 19,232 yd^3 (14, 704 m3) plus an additional 13,885 yd^3 (10,616 m3) in change orders.


Seen above is the round columns, most had a roof to wire and support, some as seen above did not.

The base contract work consisted of 12,520 yd^3 (9,572 m3) of Structural Perimeter Walls (one-sided finish), 3,904 yd^3 (2,985 m3) of Interior I-Beam Walls (two-sided finish), 2,436 yd^3 (1,863 m3) of Interior Steel Reinforced Walls (two-sided finish), 372 yd^3 (284 m3) of 101 each 24 in (61 cm) diameter Circular Columns, 16 each 12 in (30.5 cm) diameter Circular Columns, and 16 each 3'x3' (91 x 91 cm) Square Columns. The change order work was an additional 13,000 yd^3 (9,939 m3) in one sided wall smoothening and 885 yd3 (676.6 m3) of one sided walls with a rubber float finish.

One of the four levels of interior walls

Each of the three bays shown is a future train corridor for Long Island Railroad. To the right you can see square columns.

The Shotcrete process was used for all Vertical elements on this project, occurring from December 2012 to August 2015. Superior Gunite utilized a 5,000 psi concrete mix supplied by Ferrara Bros. Building Material Corp. and Tec Crete Transit-Mix Corp to aid the General Contractor in meeting Federal DBE goals. The coordination between the providers and teamwork was instrumental in making this job a success. The major challenge was shooting through the difficult East Coast winters and tenting and heating thee placements through the zero degree temperatures. All structural walls and columns required a steel trowel finish. This was especially difficult when it came to circular columns. To aid in the precise finish of the columns, workers used fabricated trowels and a cutting rod that were shaped to the curve of the column.

Author Biography:

Frank E. Townsend III, is the East Coast Region Manager for Superior Gunite. He is a Civil Engineer graduate of Worcester Polytechnic Institute, in MA, and Master's Degree from the University of Missouri. Frank comes from the

Army Corps of Engineers and has been running Superiors East Coast operations (Predominantly New York, New Jersey, Connecticut, and Boston) for 4 years now. Frank is an active member of ACI and ASA, and currently serves on the ASA Board of Directors.