

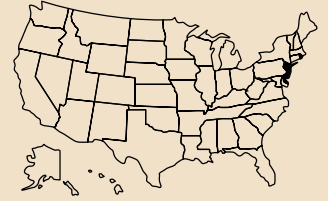
86th Street Station, New York, USA

Project specifications

Project type: Metro
Application: Steel fiber-reinforced
sprayed concrete

Partners

Owner: Metropolitan Transportation Authority (MTA)
Engineer: New York City Transit Authority
Contractor: Skanska/Traylor Joint Venture



The first phase of New York's long-awaited Second Avenue Subway opened in 2017. Nearly 2 miles (3km) long, the project required staging heavy civil construction in one of the world's biggest and busiest cities. Along with the new twin track tunnels, Phase 1 included the construction of three new stations that are among the largest underground excavations in North America.

The challenge

The contractor used drill and blast to excavate through hard rock ground conditions for the 86th Street Station cavern of approximately 1,100ft length by 70ft width and 60ft height (335m x 21m x 18m).

To support the face, the joint venture used rock bolts and shotcrete before installing a waterproof membrane system and the final reinforced concrete structural lining.

All of this work needed to be performed below the busy streets of Manhattan, with minimal disruptions to pedestrian and vehicular traffic.

The solution

Steel fiber reinforcement had been chosen for the station cavern's temporary lining instead of traditional steel mesh, and Bekaert supplied Dramix® 65/35BG fibers.

With such a large cavern to support, the homogeneity of steel fibers provided resistance to tensile stresses at all points in the shotcrete layer.

In addition, fiber reinforcement, when compared with traditional mesh reinforcement, can be applied more quickly and its uniform thickness reduces shotcrete consumption and overall concrete cost. This can improve construction schedule and help avoid potentially extensive disruptions in densely-populated urban areas.