



Arup and Metropolitan Transportation Authority design team celebrate completion of the Fulton Center transit hub

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Arup, a multidisciplinary engineering and consulting firm with a reputation for delivering innovative and sustainable designs, has completed the Fulton Center transit hub, one of the most ambitious capital projects undertaken by the Metropolitan Transportation Authority (MTA) since its inception in 1968. In 2003, Arup was appointed prime design consultant to the MTA, and since then has led a 25-member sub-consultant team that included Fulton Center building design architect Grimshaw Architects; historic preservationist and architect Page Ayres Cowley Architects; and HDR|Daniel Frankfurt on existing station rehabilitation. Arup delivered a range of multidisciplinary design services as well as overall planning and project management for the \$1.4 billion federally-funded project through nine integrated construction contracts since November 2004. The Fulton Center opened to the public on November 10th following a ribbon-cutting event on November 9th.

The Fulton Center is a modern subway interchange that revitalizes post 9/11 Lower Manhattan. It is an important hub that will serve up to 300,000 transit riders who will pass through the center's nine subway lines on a daily basis. Additional transit options will be available, including transfers to the E when the World Trade Center transit hub opens, and the 1 line once the Cortlandt St. Station is rebuilt, as well as the New Jersey PATH. The overall work involves a number of distinct sub-projects: construction of the main transit center building, rehabilitation of five existing stations, rehabilitation and restoration of the federally landmarked historical Corbin Building, construction of an underground pedestrian concourse, and future connections to two other stations. There is also more enhanced street-level access to the subway, including ADA improvements.

"This project creates a downtown "Grand Central" station that is a beacon for transit users in Lower Manhattan, and it helps remove friction between the various older subway lines built since 1904," said Michael Horodniceanu, president of MTA Capital Construction.

Improving the passenger experience is the primary architectural goal for the Fulton Center. The new main entrance pavilion, located at Fulton and Broadway and designed by Grimshaw Architects and Arup, is the most visible element of the subterranean complex. Amenities within the building maximize daylight and encourage social interaction. Taking cues from the popular terraces that overlook Grand Central Terminal's great hall, an elevated mezzanine featuring opportunities for caf   and dining areas circumscribes the dome.

"The station provides an enhanced user experience, one which helps bring the NYC subway system into the 21st century. This has not just been a team effort, but a marvelous team result, it has been a privilege to work with all the team members of the Fulton Center project team," said Uday Durg, senior vice president and program executive, Lower Manhattan Projects for MTA Capital Construction.

The Fulton Center's most prominent architectural feature is the oculus: a slanted, hyperboloid

domed atrium composed of glass and steel that creates a dynamic civic space. Stretched within that structure is a sculptural centerpiece, a reflective cable net structure with reflective panels that bounce natural light down to the lowest levels of the atrium to help orient passengers passing through the Fulton Center. The Sky Reflector-Net (2013), an integrated artwork, is an engineer, architect, and artist collaboration with Arup, Grimshaw Architects and James Carpenter Design Associates, commissioned by MTA Arts and Design and MTA Capital Construction Co. (MTACC). The Sky Reflector-Net expands the architectural expression of the central meeting place within the Fulton Center, and provides engineering and technical functionality in the operation and security of the facility. The cable net is a powerful example of the capacity of a large tensile structure to define a landmark public space.

Integral to this effort is the major historic preservation and restoration of the landmarked Corbin Building as an entry and retail pavilion. Described by contemporaries as the "father of the skyscraper," prominent NYC architect Francis Hatch Kimball designed the building in the decorative Romanesque style, and at the time of construction in 1888-89 it was Manhattan's tallest building. To make way for the new Fulton Center pavilion, the Corbin Building was initially scheduled for demolition, and Arup hired the historic preservation specialists Page Ayres Cowley Architects (PACA) to research and document the building before it was demolished. Late in 2003 the Corbin Building was added to the National Register of Historic Places, and the overall project design was revised to save and incorporate it into new Fulton Center. The Corbin Building encloses the southern boundary of the new facility and forms a visible main entrance at street level, as well as providing retail and commercial space above grade, and building services and utility space within its two levels of existing basement.

Sustainability is a major focus of this project. At the outset, the MTA New York City Transit set a goal of building an environmentally responsible transit center by prioritizing energy efficiency, resource conservation, life-cycle value, pollution prevention and responsible waste management. At the same time, issues of comfort, functionality, human health and productivity were to be considered in every aspect of the work.

Arup drew upon its international experience on transit oriented development from its Hong Kong, UK and Australia offices crossed with its global experience in airport terminal, retail, and building operations. Arup was instrumental in advising on the program and usage throughout the facility. In 2007, Arup suggested amendments to the proposed use of offices to mixed-use retail in support of the local neighborhood, to help increase non-fare box revenue opportunities, and as a reduction to MTA in ongoing operational costs through a master lease approach. This bundled both the tenant retail, advertising and other revenue opportunities with facility operational duties for maintenance, operations, and cleaning into a public-private-partnership approach. Westfield from Australia negotiated and won the master lease providing the MTA with significant added value and cost savings to the ongoing servicing of the facility, benefitting the subway ridership, local neighborhood, businesses and the public at large with new and better amenities, safety and security.

The Arup Design Team has supported the construction of the project working alongside PB-Lend Lease LLC as consultant construction managers. Arup was responsible for the contract packaging, engineer's cost estimates, and technical reporting to the FTA and other state and city agencies. The construction was undertaken in nine construction contracts: eight design-bid-build and one design-build procurement. The project has won many awards, including the ASCE New York State Design-Build project of the year award in 2009.

Additional project team members working on the broader Fulton Center project include architects HDR | Daniel Frankfurt who led the architectural design of the Dey Street Headhouse and the 135 William St. entrance to the rehabilitated A/C Mezzanine.

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