

BEST OF
2007
AWARDS

FDR East River Drive Rehabilitation

PROJECT OF THE YEAR: Highway/Roadway

A 1.25-mi stretch of the FDR East River Drive between East 53rd and East 63rd streets was literally crumbling. The critical artery, which transports 150,000 vehicles a day along Manhattan's congested east side, was in need of extensive repairs.

Built 60 years ago, the drive's concrete roadway and retaining walls were exhibiting serious deterioration. Loose concrete was falling onto the highway from the undersides of the viaduct and roof deck. Exposed rebar and decaying structural members were evident throughout the structure.

To address the situation, the New York State Department of Transportation initiated a five-year, \$146 million reconstruction project completed in July.

The effort entailed the rehabilitation of the complex, three-tiered structure consisting of northbound lanes on the lower tier, southbound lanes running through a viaduct in the middle and a roof deck providing the foundation for parklands and residential buildings above the stacked underpass.

Tasks included replacement of the viaduct and bridge superstructures; rehabilitation of the highway's roof, retaining walls and barriers; seismic retrofitting; installation of new lighting, signs and drainage systems; and restoration of the parks atop the roadway.

NYS DOT realized the conventional approach to roadwork, closing one lane for reconstruction during the day and all lanes at night, was not a viable option. Closures would only worsen an already badly congested area and nighttime work would disturb the adjacent densely populated residential area.

To solve the problem, the project team



built a temporary roadway over the East River to carry the northbound traffic. Dubbed the FDR Outbound Detour Roadway, the detour allowed the contractor, a joint venture of Slattery Skanska of Whitestone, N.Y., and Weeks Marine Inc. of Cranford, N.J., to shut down an entire section of the permanent roadway to facilitate reconstruction.

"The Outboard Roadway turned a seven- or eight-year project into a 56-month project and turned an all nighttime and weekend project mainly into daytime work," says John Crecco, project superintendent for Skanska.

A traffic study estimated the detour also saved drivers more than seven million hours of delays.

Preparatory work for the project included the installation of vibration-monitoring equipment in the adjacent neighborhood and the MTA's East River tunnel. Rockefeller University's 63rd Street pedestrian bridge was also modified to permit traffic to pass under its eastern support, >>

Key Players

Owner: New York State Department of Transportation

Design Team: DMJM Harris, New York; Sam Schwartz Co., New York; Earth Tech/TAMS, Long Beach, Calif.

Engineer: HDR|Daniel Frankfurt, New York

Resident Engineer: Edwards and Kelcey, Morristown, N.J.; URS, San Francisco

Highway Contractor: Slattery Skanska, Whitestone, N.Y., now known as Skanska USA Civil Northeast Marine Contractor; Weeks Marine, Cranford, N.J.

Steel Erector: Archer Steel Construction, Manalapan, N.J.

Electrical: Welsbach Electric, College Point, N.Y.

Asphalt Paving: M&S Construction, Staten Island

Concrete Paving: Unicorn Construction Enterprises, Chestnut Ridge, N.Y.

Cutting: Cutting Technologies, Gloucester City, N.J.

Roof Hydrodemolition: Rampart Hydro Services, Coraopolis, Pa.

Best of 2007 Awards

providing uninterrupted pedestrian access to the East River esplanade during the project.

Construction of the \$60 million, two-lane detour started in November 2002. The 3,000-ft-long structure consisted of 64 steel pipe caissons driven into the bottom of the river supporting a standard bridge superstructure of steel-framed girders and a precast concrete deck topped with asphalt. A wall on the west side of the roadway and a metal panel roof were installed to minimize noise.

Once the detour was completed in October 2006, northbound FDR traffic was diverted onto the outboard roadway. Southbound traffic was then redirected to the old northbound roadway on the lower level, freeing up the southbound viaduct structure for reconstruction.

Prior to the diversion of the southbound traffic, a shield was built over the lower

roadway to protect it during demolition and reconstruction.

Reconstruction of the viaduct required demolishing the 27-in reinforced concrete deck slab and replacing it with a 9.5-in composite reinforced deck made up of longitudinal steel beams tied to transverse floor girders with steel supports. The old deck was cut into pieces and the sections lifted onto barges by cranes for transfer to a recycling operation in New Jersey.

Because the steel supports could not be replaced, the team instead retrofitted the columns with additional steel members and added new steel columns to the structure. The ovals of concrete encasing the existing steel were replaced and seismically retrofitted with fiber-reinforced polymer wrap, which consists of carbon fibers in an epoxy matrix.

The massive concrete retaining walls,

which separate the drive from the local streets above, exhibited serious deterioration, in part due to salt from both the river and winter road salting. The team employed an innovative chloride extraction system to remove the salt from the walls. Embedded galvanic anodes were also used to mitigate corrosion.

With the completion of the reconstruction of the viaduct, the southbound traffic was switched back to its original configuration. This permitted the team to begin reconstruction of the lower roadway, which required new pavement, lighting, drainage and safety barriers.

The final phase of the project rerouted the northbound traffic back to the lower roadway and dismantled the fender system and the outboard detour. The East 63rd Street pedestrian bridge was also restored to its original configuration. <<