

48th Street Entrance Ramp to FDR Drive

New York, New York



The 48th Street entrance ramp to the northbound Franklin D. Roosevelt (FDR) Drive in New York City had been closed to traffic since 1987. In 1996, after nine years of extensive traffic congestion on Manhattan's east side, elected officials and the New York State Department of Transportation (NYSDOT) made a commitment to the community to reopen the 48th Street entrance ramp as quickly as possible.

Owner's Criteria

As part of the State's commitment to the community and to the traveling public, the following critical issues were addressed:

- Fast-track schedule that would permit the ramp to open quickly. NYSDOT estimated 15 months for final design and 18 months for construction;
- Technological improvements to the ramp design to improve safety, reduce maintenance and be aesthetically compatible with the United Nations/East Side Manhattan neighborhood;
- Community participation program to ensure that neighborhood concerns were addressed. These provisions included functional aspects of the design, as well as noise concerns for residential areas and security concerns at the United Nations garage during construction.
- Construction staging to maintain three lanes of traffic on northbound and southbound FDR Drive during peak hours, and minimal closures of lanes at night.

Establishing a Fast-Track Schedule

NYSDOT's original schedule for reopening the ramp on a fast-track schedule called for a time frame of 15 months for final design and 18 months for construction, for a total of 33 months.

Cooperation between designers and NYSDOT accelerated the actual design work and produced final contract documents in twelve months, shaving three months off NYSDOT's design schedule.

In addition, the contract was bid in a cost-plus format that requires contractors to bid a contract amount for work items and to commit to a maximum construction duration. Detailed constructability analyses were performed during design, reducing NYSDOT's construction schedule by six months.

The contractor who was awarded the project was able to reconstruct the ramp and open it to traffic in seven months, which was five months ahead of our firm's schedule. A project that began with a 33 month schedule had been completed in 19 months.

Technological Improvements

The new ramp, one of the first composite box girders to be used in the New York metropolitan area, is a continuous four-span bridge, approximately 133 m in length, comprised of twin steel box girders. The ramp has a horizontal curvature of 90 degrees with a 50 m radius. The box girder design was selected because its configuration is particularly compatible with the client's criteria:

- The box girder design offers clear aesthetic advantages over I-beam construction. In response to its highly visible location, the new ramp design is a sleek four-span bridge with trapezoidal box girders. The new ramp's longer spans reduce the number of columns and promote a clean appearance;
- Box girders are an efficient structural cross-section which resists the high torsional stresses caused by tight curvature; and
- Box girders reduce maintenance requirements as compared to I-beam construction. Because box girders do not have exposed lower flanges to collect debris, maintenance requirements are reduced.

NYSDOT's goal was to comprehensively address all technical issues related to the ramp design. The new entrance ramp at 48th Street had to alleviate the congestion along First Avenue while providing a safe access for the vehicular traffic. Our firm's design of the reconstructed ramp included geometric improvements that doubled the acceleration distance of the previous ramp, therefore allowing for a longer acceleration lane for entering vehicles to merge with the northbound mainline traffic. Major restriping and signage was also included to facilitate the merge between the ramp vehicles and the vehicles traveling on the northbound mainline FDR Drive.



Accommodating Community Concerns

A priority for NYSDOT in the design and construction of the ramp was to address the various concerns of Manhattan's east side community.

First, the community requested that the new ramp not preclude the potential for future pedestrian and bicyclist access to a future East River esplanade. As a result, the new ramp is located north of the previous ramp location to allow space for a future pedestrian and bicyclist ramp from First Avenue to a future esplanade.

Secondly, the project team met with the United Nations regularly during the design stage to discuss potential security issues. As a result, the contract documents include special notes and details to address these security concerns.

Thirdly, to alleviate concerns about construction noise during nighttime hours, noise-intensive operations were restricted at night. In addition, the contract documents included a contractor incentive for early completion of the pile-driving operations for the foundations.

Finally, to inform the community of the project's progress throughout the design stage and also to give the community the opportunity to voice their concerns, NYSDOT and our firm met with the community regularly during the twelve months of design to discuss the project progress. Task force meetings were held during construction to keep the interested parties informed about the project's progress and to discuss any concerns. A web page for the project kept the public informed during construction.

Cost

Design was completed under budget. The construction contract, bid at very competitive prices, was also completed within the budget and the contractor received the full incentive bonus.

Conclusion

The design of the 48th Street entrance ramp required a coordinated approach to integrate NYSDOT's criteria, the concerns of the community and a level of technological sophistication that improves vehicular safety and future maintenance.

Project Team

Owner	New York State DOT
Designer	TAMS Consultants, Inc.
Steel Fabricator	Tampa Steel Erecting Co.
Steel Detailer	Tensor Engineering Co.
Steel Erector	Rice-Mohawk Construction Company
General Contractor	DeFoe Corp.