



ARORA and ASSOCIATES, PC
Consulting Engineers

Project Data

Owner:
New Jersey
Department of
Transportation

Designer:
ARORA and
ASSOCIATES, P.C.

Construction Cost:
\$24.3 million

*Arora met the
challenge of a
public/private
partnership's
accelerated
project schedule.*

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ROUTE I-95/SCOTCH ROAD INTERCHANGE IMPROVEMENT



Scotch Road (CR 611) over Interstate 95

When Merrill Lynch proposed to relocate their corporate headquarters to Ewing Township in New Jersey, Arora and Associates, P.C. met the challenge of a demanding project schedule required by both Merrill Lynch and the New Jersey Department of Transportation. Improvements to the existing Route I-95/Scotch Road interchange were required to meet the anticipated traffic demand due to growth and development along the interstate corridor and secure this important corporate relocation for the State of New Jersey.

The existing diamond interchange could not handle the traffic volume generated by the proposed massive corporate park, subsequent build-outs and adjacent developments. Arora identified roadway deficiencies, projected traffic volumes and utility, ROW, environmental, community and traffic issues. Arora proposed to convert the existing diamond interchange to a full cloverleaf. Arora also recommended adding two collector-distributor (CD) roadways on Route I-95, superelevating over one mile of interstate roadway to eliminate substandard geometry and replacing the functionally obsolete bridge.

As part of the interchange reconstruction, the Scotch Road (CR 611) over I-95 Bridge had to be replaced. Innovative solutions were developed to reduce project costs. Arora specified NJDOT's first use of high performance weathering steel (HPS70W). Using this material allowed for the elimination of an entire girder line and provided greater flexibility in the construction staging. Designing prefabricated wall systems reduced the construction duration. Integral abutments eliminated deck joints, reduced future maintenance needs and provided increased durability. Instrumentation of the high performance steel and integral abutments was also incorporated into the project to assist NJDOT in evaluating and preparing future design standards. Aesthetic treatments incorporated into the bridge design consisted of applying a horizontal stripe on the pier cap to match the color of the weathering steel, using slanted cheekwalls, mimicking the pattern of the multi-column piers on the abutment MSE walls and providing black PVC coated chain link fence. These simple but effective aesthetic treatments enhance and lengthen the appearance of this workhorse bridge.

Permits and wetlands mitigation were critical path items, so Arora partnered with NJDEP to secure the required permits and develop the best strategy for mitigation. Three-sided precast culverts with natural stream bottoms were designed to provide for fish and deer migration.

To accomplish the interchange reconstruction and provide for the future needs of development along Scotch Road, numerous utility accommodations and relocations were required. The Williams Pipeline transcontinental corridor was affected by the project. Their 30", 36" and 42" gas lines were lowered 16 feet during nighttime construction without a disruption of service. To accommodate an adjacent office park, Arora worked with the Ewing-Lawrence Sewer Authority to relocate and redesign a pump station. This resulted in a project cost savings of over \$600,000. During construction, Arora also provided the Merrill Lynch office complex with redundant electric feeds to ensure uninterrupted power service to their facility.

Quality Assurance/Quality Control is an integral part of the corporate culture at Arora. Project Specific Quality Control Plans are developed for each project, and all contract deliverables are subject to a series of independent technical reviews. Arora's construction engineering group also performs a separate constructibility review. One of the project design constraints was to maintain traffic on I-95 and Scotch Road throughout construction. Maintenance and protection of traffic was accomplished through a combination of staging for the interstate and intermittent detours for local traffic. The bridge was constructed with only brief nighttime slowdowns of the interstate traffic to allow for girder erection. Arora also developed construction durations for the baseline construction schedule and incentive/disincentive clauses for lane outages and detours.

The \$24.3 million construction contract was awarded in June 2001 to Ferreira Construction Company. Arora provided construction support services to NJDOT including the review of fabrication and working drawings, advance utility relocations, scheduling and office support. The project was completed prior to the opening of Merrill Lynch's office complex.



Aerial of completed interchange

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