



ARORA and ASSOCIATES, PC  
Consulting Engineers

*Arora created a signature bridge to complement a national landmark.*

*What can we do for your project?*

## DELAWARE AND RARITAN CANAL BRIDGE OVER US ROUTE 1



Arora and Associates was retained to create a signature bridge for the Delaware and Raritan Canal Commission. The bridge unifies the Delaware and Raritan Canal's towpath bifurcated by Route US 1. It evokes the image of the history of the commercial growth of the region brought on by construction of the D&R Canal and the railroads.

The D&R Canal, as it is locally known, is on the National Register of Historic Places and a key element of the East Coast Greenway between Boston and Washington, D.C.

The challenge to Arora and Associates was to design a pedestrian overpass that enhanced the linear state park and do so on a tight schedule and fixed budget. Our structural engineers evaluated several options during the concept development stage. Arora worked closely with the New Jersey Department of Transportation (NJDOT), the Delaware and Raritan Canal Commission (DRCC) and the Historic Preservation Office (HPO) of the New Jersey Department of Environmental Protection (NJDEP) and local community groups, before selection of the preferred alternative was made.

The choice of a curved-chord Pratt truss was inspired by railroad bridges constructed during the period the D&R was in operation.

To further complement the park and the main truss span, steel thru-trusses were selected for the approach ramps, and piers were detailed with coursed-rubble, gray sandstone masonry. The resultant structure has been cited by NJDOT and environmentalists as an example of "Context Sensitive Design." The bridge is ADA, bicycle and pedestrian compatible.

The project has been nominated by NJDOT for New Jersey's 2004 Historic Preservation Awards Program and FHWA's 2004 Excellence in Highway Design.

The pedestrian bridge consists of a 130-foot curved steel truss over US Route 1 with three 66-foot ramp trusses and concrete ramps supported by stone faced retaining walls. Site development included construction of graded approaches, signing and parking lots. The trusses, picket fencing and enclosure fencing are painted black and firmly grounds the structural architecture with the past. Bolted connections mimicked traditional riveted connections and facilitated fabrication. The truss was fabricated on site and lifted in a single operation at night with only a brief interruption of traffic.



Arora designed the structure for a single lifting operation.

Although the bridge looks as if it predates the highway, Arora used state-of-the-art engineering and materials to meet project objectives of a durable, low-maintenance structure. This ADA compatible bridge was designed using AASHTO LRFD specifications for bridges and structures. Arora provided complete engineering services including survey, geotechnical engineering, site development, structural design, maintenance and protection of traffic and environmental permitting.

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