The I-295/I-76/Route 42 interchange is the most congested interchange in southern New Jersey. Motorists have been experiencing delays at this location for more than 20 years as they commute into Philadelphia and use the route as a north/south alternative to the NJ Turnpike. Today, the Average Daily Traffic (ADT) is approaching 250,000, and accident rates are up to seven times the state average.

The New Jersey Department of Transportation (NJDOT) identified the need to upgrade the interchange in the late 1980s, with further studies through the 1990s determining that a full interchange replacement was the only solution. In 2000, NJDOT selected Dewberry to perform the Feasibility Assessment. Environmental Impact Statement, and Preliminary and Final Design services for the $900 million project.

The purpose was to provide a new I-295 six-lane mainline connection through the interchange and improve safety by improving ramp alignments and eliminating subdivisions geometric conditions. Significant community and environmental constraints complicated the project, including floodplains, wetlands, a Catholic church, an elementary school, a cemetery, a historic housing community, two baseball fields adjacent to a school, a cemetery, a historic housing community, and two baseball fields. NJDOT investigated splitting the project into smaller contracts—and arrived at an Advanced ITS contract size, NJDOT investigated splitting the project into smaller contracts—and arrived at an Advanced ITS contract.

Design of the project began. Due to the significant elevation difference between the existing and proposed roadways, more than 20 temporary sections of roadways and ramps are required to maintain traffic. NJDOT has stipulated that all lanes be maintained on the mainline and ramps during peak periods (from 5:00 a.m. to 11:00 p.m.).

Mechanically Stabilized Earth (MSE) walls will be used to retain proposed roadway embankments with fill heights approaching 30 feet at some locations. Specialty walls used in cut sections include drilled soldier pile and lagging walls to minimize vibration to homes less than 10 feet away, and a 40-feet-high, cast-in-place concrete retaining wall utilizing a temporary braced excavation system to avoid impact to adjacent grave sites. The proposed bridge that will provide the direct connection of I-295 through the interchange will be a five-span steel girder structure with a total length of approximately 1,100 feet. The horizontally curved alignment of the bridge over Route 42/I-76 and Browning Road restricts potential pier locations, resulting in long span lengths. Due to the extreme height of the pier foundations, and to expedite construction, precast post-tensioned piers will be used.

Meeting (ACM) group consisting of representatives from the NJ Department of Environmental Protection (NDEP), the U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (USACE), etc.; and the Design Core Group consisting of NJDOT and Federal Highway Administration (FHWA) experts. Streamlining was used as a method to reach a consensus between all stakeholders in order to move forward. Concurrence for an alternative was sought from the participating groups and agencies at each key milestone.

The 26 initially developed alternatives represented varying degrees of impact on the surrounding properties and the environment. Through a series of meetings with each of the three stakeholder groups, these 26 alternatives were shortlisted to five alternatives. Each of the five shortlisted alternatives had a similar horizontal mainline scheme with variations to the vertical geometry and one ramp alignment. The preferred horizontal alignment accomplished as many of the improvements as possible within the existing Right-of-Way (ROW) to minimize impacts. Even with that, 36 parcels totaling 11 acres of ROW were required. Technical Environmental Studies were then performed and compared, and the groups and agencies held a series of meetings to arrive at the Preferred Alternative. In March 2009, a Record of Decision was received from the FHWA.

At this point, the Preliminary Design of the project began. Due to size, NJDOT investigated splitting the project into smaller contracts—and arrived at an Advanced ITS contract and four interchange contracts ranging from $150 to $200 million. Construction of the Advanced ITS contract began in the fall of 2011 (Diehl Electric) and consisted of placing travel time systems, variable message signs and CCTVs on each of the four approaches to the interchange. Construction of Contract 1 began in March 2013 (PKF Mark III), initiating the reconstruction/widening of Route 42/I-76, the local road bridges, numerous retaining walls and some temporary ramps.

Some of the challenges associated with the design and construction include complex construction staging and maintenance of traffic, numerous retaining walls of many different types to minimize impacts, soft soil conditions and the proposed I-295 mainline bridge. Due to the significant elevation difference between the existing and proposed roadways, more than 20 temporary sections of roadways and ramps are required to maintain traffic. NJDOT has stipulated that all lanes be maintained on the mainline and ramps during peak periods (from 5:00 a.m. to 11:00 p.m.).

Mechanically Stabilized Earth (MSE) walls will be used to retain proposed roadway embankments with fill heights approaching 30 feet at some locations. Specialty walls used in cut sections include drilled soldier pile and lagging walls to minimize vibration to homes less than 10 feet away, and a 40-feet-high, cast-in-place concrete retaining wall utilizing a temporary braced excavation system to avoid impact to adjacent grave sites. The proposed bridge that will provide the direct connection of I-295 through the interchange will be a five-span steel girder structure with a total length of approximately 1,100 feet. The horizontally curved alignment of the bridge over Route 42/I-76 and Browning Road restricts potential pier locations, resulting in long span lengths. Due to the extreme height of the pier foundations, and to expedite construction, precast post-tensioned piers will be used.