



2008 ?? Route 70 Bridge over Manasquan River (September 11 Memorial Bridge)

Description

Meta Fields

Project Location :

State Route 70 over the Manasquan River connecting Brick Township in Ocean County and the Borough of Brielle in Monmouth County

Mobility Impact Time : ABC: reduced use of off-peak single-lane closures and temporary stoppages ; Conventional: 3.5 x longer for cast-in-place pier activities compared to precast piers

Impact Category : Tier 6 (longer but reduced by months/years)

Dimensions : 724-ft-long and 94.67-ft-wide six-span prestressed bulb-tee girder twin bridges (each bridge has two continuous units: 119 ft $\hat{??}$ 120.25 ft $\hat{??}$ 120.25 ft)

Average Daily Traffic At Time Of Construction : 32300

Traffic Management : Traffic management alternative, if constructed conventionally: extended use of multiple off-peak single-lane closures and temporary stoppages

Existing Bridge Description : The existing 18-span single-leaf bascule span bridge was 625 ft long and 56.83 ft wide, with full-height concrete abutments, pile bents and solid concrete piers at the bascule span. It had two 11-ft-wide traffic lanes in each direction, with no shoulders. Built in 1936, the bridge was structurally deficient and functionally obsolete, and required replacement.

Replacement Or New Bridge : The bridge is on a regional corridor, which is also a coastal evacuation route, and it crosses a navigable waterway. The replacement bridge increases the vertical clearance from 15 ft to 25 ft, and widens the navigation channel from 50 ft to 75 ft. It has two 12-ft-wide traffic lanes, 4.67-ft-wide and 10-ft-wide shoulders, and a 6-ft-wide sidewalk in each direction. The cross-section consists of twelve 71-inch-deep pretensioned concrete bulb tee girders spaced at 8 ft, except for a 7-ft-wide spacing between the two centerline beams, with a 9-inch-thick cast-in-place high performance concrete (HPC) deck. The precast pier elements consist of high-strength HPC cofferdam shells and post-tensioned columns and caps. The precast piers were designed to be aesthetic, while limiting both the bridge footprint and amount of required excavation due to environmental concerns. The precast piers are V-shaped with inclined tapered exterior columns and a vertical middle column, with a 5-ft-wide 7-ft-deep hollow prestressed concrete box beam cap. The piers are supported on a footing cast in the precast cofferdam shell and founded on 24-inch-diameter concrete-filled steel pipe piles.

Construction Method : Staging and Maintenance and Protection of Traffic: Staged construction was used to maintain traffic and minimize right-of-way requirements. In Stage 1, a portion of the eastbound side of the existing bridge was demolished to provide clearance to construct the 47.33-ft-wide eastbound half of the bridge. The existing bridge was used as a working platform to erect the girders for the eastbound bridge, and galvanized steel intermediate diaphragms were installed. The deck and continuity diaphragms at the piers were cast, and a temporary cantilevered sidewalk was constructed. Four 10.92-ft-wide temporary traffic lanes were striped, and traffic was transferred to the new eastbound half of the bridge. In Stage 2, the existing bridge was demolished and the westbound half of the new bridge was constructed similar to the eastbound bridge. The temporary sidewalk on the eastbound bridge was removed, and a permanent sidewalk constructed. The westbound bridge was then opened, with traffic lanes on both bridges in their final configuration. Throughout the project, two lanes of traffic were maintained in each direction except for a weekend detour and periodic off-peak single-lane closures and temporary traffic stoppages. The weekend detour at the end of Stage 1 was necessary to address grade changes and construct tie-ins from the new Route 70 eastbound roadway to local streets. Construction: All right-of-way acquisition was completed prior to the start of construction, and a generous in-water temporary tidelands construction easement was provided. Environmental permits for the project included in-water work restrictions to protect endangered species, including no work in the water from January 1 to April 30. To minimize environmental impacts, precast elements were fabricated offsite, trucked to the project, and then loaded onto barges. To reduce the steps required to erect the precast columns, the contractor fabricated, with owner approval, the 16-ft-high columns as a unit, rather than fabricating them in 4-ft-high segments as shown on the plans. Large land-based and barge-mounted cranes were used to erect the precast elements at the site. Embankment construction utilized mechanically-stabilized earth (MSE) walls. Temporary roadway

