A Bridge Reborn

Revitalizing a 90-year old bridge in Allentown, New Jersey

BY BARBARA BILLITZER

The Monmouth County Bridge in the borough of Allentown, New Jersey, has served as a vital link for residents and local businesses for nearly a century. Originally built in 1921, it connects the city's Main Street area and spans over Mill Pond and Doctors Creek at the southerly end of Allentown's small business district.

Repairs had been made to the bridge in February 2001 when a hole formed in the concrete deck. At that time, a steel repair plate with an asphalt overlay was installed, reducing the weight limit to 10 tons. However, over the years, the structure continued to deteriorate. The bridge was corroded completely through the lower web and showed upstream fascia girder loss and web holes. Before long, the bridge was down-posted to a five ton weight limit. The dam and spillway were also severely deteriorated, and there was concern that a potential flood disaster was imminent should structural failure occur.

Talk of a complete renovation began in 1992 when the New Jersey Department of Environmental Protection (NJDEP) provided a grant for the inspection and evaluation of the pond and dam. But Allentown Borough is a very small municipality with limited financial resources, and although bridge replacement and maintenance are the county's responsibility, borough officials were concerned about the cost of future maintenance of the dam and spillway.

NEED FOR A BYPASS

The Allentown Main Street (CR 539) commercial district is essentially a historic area attracting a tourist trade as well as local commerce, so closing the bridge and detouring traffic around the borough was not considered to be an economically favorable option.

To alleviate any possible economic hardship to Allentown's three dozen or so merchants, construction of a bypass roadway was considered to be a critical factor. It was the only way to ensure uninterrupted traffic flow. If traffic had to be detoured around Allentown, the local businesses would have suffered significantly.

The solution the borough settled on was to construct an earthen berm temporary roadway alongside the bridge

to maintain traffic flow during the reconstruction of the principal bridge. The temporary bypass roadway needed to be constructed as quickly as possible given the poor condition of the aging dam and bridge. The bypass was essentially a compacted earthen wall with flow through designed to maintain the normal water level of the pond and normal flow over the dam and spillway.

BEYOND THE BRIDGE

There were other components that were critical to the success of the project. The Allentown Pond Dam's spillway had deficient hydraulic capacity. Its flow was controlled by manually operated timber gates, original to the circa 1920s structure. The gates rose when an individual lifting mechanism slid between two restraints on either side, and the resulting deterioration had caused seepage through the stop boards. The dam not only had exposed stone masonry, it had missing and deteriorated concrete on the northwest wing wall. The dam and spillway were so severely deteriorated that the Dam Safety Commission had imposed a deadline for replacement and/or draining the 33-acre Mill Pond to prevent a potential flood disaster should structural failure occur. Demolition and reconstruction of a new dam and spillway were needed, as well as the reconstruction of a raceway to power the water wheel under restoration at the mill building.

The county also marked hollow-sounding areas of northwest wall beneath the bridge, and in addition to failed areas, there were serious concerns about the rest of the bridge structure. Monmouth County began inspecting the bridge on a monthly basis.

SHARING THE RESPONSIBILITY

In 1993, the borough and the county entered into an agreement to fund an inspection of the structure and submit a final report to the NJDEP. The study concluded that the dam was inadequate and needed replacement. In 1996, the county awarded a contract to redesign the bridge and dam.

State legislation permitted the NJDEP to assign ownership and maintenance responsibilities for the pond, dam and bridge. The NJDEP determined that Monmouth County owned the road and bridge and that Allentown owned the pond. The county and the borough share ownership of the spillway.

Over the following ten years, the county worked with the state's historic preservation office on the project, as it required both environmental and historic permits. There were a lot of details to review, including planning for fire, emergency services and utility needs. In 2007, the NJDEP and the New Jersey Attorney General mandated that the county inspect the dam biweekly and after rainfall of more than one inch in 24 hours. The county also had to provide the state with monthly progress reports and a reconstruction schedule.

The original project path included the county paying for all bridge and roadway repair, which were estimated to cost $3.4 million and $936,000, respectively. Allentown and the county had to both pay $260,000 for spillway repair costs. For water main costs, the county had to pay $22,500 and the borough had to pay $9,500. The original project was projected to take 18 months to complete. The plan called for an eight-mile detour route for regular traffic. Emergency vehicles and school buses required a two-mile detour route, which the county had to pave for that purpose.

ACQUISITION AND PRESERVATION

Moving this project forward first required the acquisition of several permanent and temporary easements. With the exception of a mini-park, which was significantly affected, there were several properties that were minimally affected located on the south side of the bridge along CR 539. Monmouth County right of way staff including Michael Haverstick, Edward Scarfi, and Thomas McCartney, worked closely with the affected property owners, resulting in 100% negotiated settlements for the necessary right of way.

Right of way acquisition was far more difficult on the north side of the bridge. This section required major construction and called for safeguarding the structural integrity of an immediately adjacent, three-story 6,000 square foot early 18th century mill building, subsequently converted to multi-tenant commercial occupancy.

The mill building was a county landmark, and it was considered to be Allentown borough's most prominent feature. Listed in the Historical Register, the building very much defined the quaint historical character of the borough's Main Street. But it was located directly along the edge of the Main Street right of way, with virtually no side setback. The foundation was stone and mortar dating from the early 1700's. The physical structure had been rebuilt in the mid-1800's after a fire, but was essentially heavy post and beam construction.

As the bridge continued to deteriorate, decay and cracks were visible in the concrete.

To alleviate potential hardship for the local merchants, a temporary bypass road was built alongside the bridge to maintain traffic flow.

The building was subject to vibration from normal traffic flow, and the structure exhibited considerable structural fatigue in the form of advanced settlement. In light of its age and advanced settlement, the county engineer determined that any excessive vibration resulting from construction activities could possibly damage the building. As a result, construction contract specifications required the use of a silent piler, which would eliminate the normal vibration associated with a traditional pile driver. Under the negotiated settlement with the property owner, the county also installed telemetric seismic monitoring devices in the building to allow for continuous vibration monitoring on a 24-hour basis, with instant notification to the monitoring center should vibration exceed a certain level specified by the county engineer. The temporarily vacated residential dwelling located opposite the mill building was also monitored for vibration using the same equipment.

TEMPORARY RELOCATION

Despite the age and condition of the quaint mill building, it was deemed suitable for tenant occupancy. A second residential property affected by the project was located at the northeast corner of the bridge. During the planning phase, the county engineer determined that it would be in the best interest of the mill building tenants and the general health and safety of the public, to temporarily close the building during construction.

The county engineer also determined that for safety reasons, and due to the immediate proximity of the temporary bypass roadway, it was necessary to temporarily relocate the owner/occupants of the residential dwelling. Monmouth County right of way staff negotiated an acceptable settlement. The owner was temporarily relocated and compensated via a lease for market rent of the house during the construction period, the provision of moving expenses, restoration of landscaping, the value of the easements taken and other incidental expenses.

In addition to relocating the owner, the temporary closure also required the relocation of two of the four tenants. County right of way staff successfully relocated both tenants to comparable office properties in nearby locations of their choice. In accordance with New Jersey relocation statutes, Monmouth County paid all moving and related expenses, including some minor fix-up costs needed for the larger office tenant. Also in accord with the statutes, both tenants were paid additional rent subsidies to compensate for higher rent in their new locations. The third tenant operated a restaurant and opted not to relocate. They were paid for a leasehold interest and directly related expenses, including professional fees. The fourth tenant, who operated a gift shop, also chose not to relocate and was also paid for a leasehold interest. Both tenants were also compensated for various legitimate expenses.

A COLLABORATIVE PROCESS

The county engineer, assistant county engineer, project manager, engineering, legal staff and others worked very closely with the NJDEP and the Dam Safety Commission to obtain all necessary permits. The focus was on preserving the Mill Pond/Doctor's Creek ecosystem, as well as the economic stability of Allentown's small business district. Additionally, the physical disruption during construction of a small New Jersey State-owned mini-park adjacent the southeast side of the bridge required negotiation and mitigation with the Green Acres Division of the NJDEP.

As in any public improvement project, there were unique challenges presented by the reconstruction of Bridge U-12. One involved coordinating and securing the approval and cooperation of all involved governmental

An 18th century mill building with multi-tenant commercial occupancy required temporary closure during construction.

agencies. In this instance, this included the NJDEP, the Dam Safety Commission, the New Jersey Department of Transportation, the Municipal Government and the general public.

The team also worked with Allentown's mayor and Borough Council on funding and construction issues, including the borough's responsibility for the future maintenance cost of the dam and spillway. This proved to be a very difficult area of negotiation, but Allentown officials worked very closely with county personnel, eventually reaching an agreement. The county engineer and staff attended numerous public meetings over a two year period, making several presentations and eventually addressing all of the concerns of local government and private citizens.

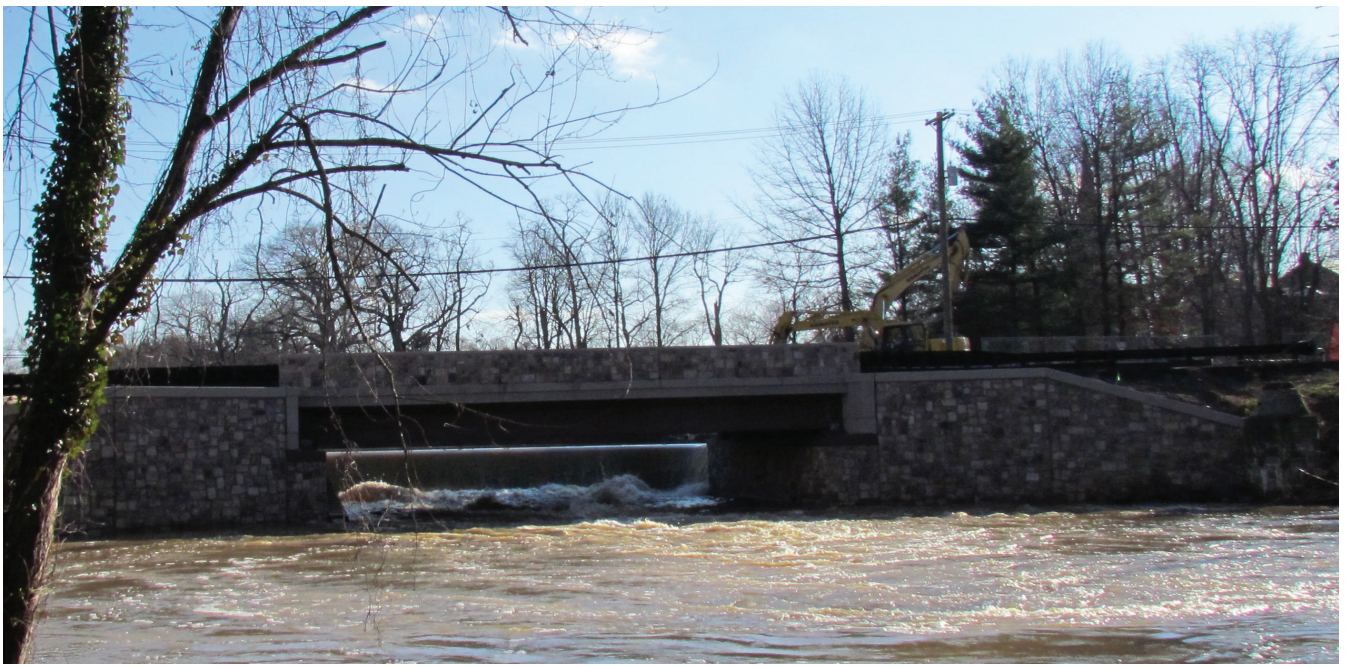
Another issue involved the physical challenges of design and construction, including the preparation of specifications and bid documents. The goal was not only to safely and successfully complete the project, but also to minimize the impact of the project on traffic flow vital to the economy of Allentown's small historic business district. Securing the necessary right of way in a timely manner was crucial to the project's success. The team's expertise in property negotiation and relocation helped them to achieve a 100 percent success rate with property owners and tenants, thus avoiding contentious litigation and lengthy and costly eminent domain action.

SUCCESSFUL EXECUTION

Throughout the process, the city's stakeholders remained consistently focused on the end result – to demolish a 90-year old deteriorating bridge and replace it with a new upgraded structure.

Several different professionals played an essential role in the project's successful execution. Foremost is Monmouth County's governing body, the Board of Chosen Freeholders including the Honorable Robert D. Clifton, Honorable John R. Curly, Honorable Lillian G. Burry, Honorable Amy A. Mallet, Honorable Thomas A. Arnone, County Administrator Terri O'Connor, Director of Public Works and Engineering John W. Tobia, Monmouth County Engineer Joseph Ettore, Monmouth County Project Manager Jon Moren, Monmouth County Counsel Andrea I. Bazer, Esq., and right of way veteran attorney Special Counsel James J. Cleary, Esq., who ensured that sufficient funding and professional support were always available.

Working closely with New Jersey state officials, Allentown's Mayor, Council and Construction Officials, Monmouth County Engineering and right of way staff were able to understand and meet the needs of local residents and businesses. Thanks to their collaborative efforts in addressing a failing structure, thousands of travelers will benefit from its vastly improved safety for years to come.



After serving as a vital link for nearly a century, the new Monmouth County Bridge U-12 opened in 2011, bringing a new level of safety to the residents and businesses of Allentown, New Jersey.