Eastern New York Chapter
of the
ASSOCIATION FOR
BRIDGE CONSTRUCTION AND DESIGN

NEWSLETTER **DECEMBER 2004** **VOLUME 11** **NO. 1**

PRESIDENT'S MESSAGE

Who would've thought it could ever happen? The Boston Red Sox win the World Series and I'm writing the President's Message for the Eastern New York Association for Bridge Construction and Design. This organization is now 10 years old and is healthy and thriving. Our membership has remained steady at about 160 people for the last few years and that seems to pretty well represent the industry in this area. Our dinner meetings draw between 50 and 75 people and our annual training sessions always have over 100 attendees. These events will only get more popular, now that Professional Development Hours are being offered at most of these functions.

This is a very uncertain time in the bridge business. The two largest owners of bridges in our area, namely the DOT and Thruway, are in the process of operationally joining together in a "Federation". The idea is to standardize specifications and design standards between the two agencies and to streamline many of the business processes that are currently done in both places. While some of these ideas seem rather easy to institute at fairly minimal expense, the real challenge for the Federation is financing the Capital Program. As DOT Commissioner Boardman said at the recent AGC conference in Saratoga, "We're broke and broken".

The Thruway Board of Directors recently authorized a toll increase for the first time in 17 years. This needs to be ratified by Governor Pataki and, if signed, will at least help the Thruway and its program. Public hearings on the toll increase are expected to begin in February. I strongly suggest that everyone in the bridge industry support the increase and make your opinion known.

The DOT's program seems to not have such a promising future. With no Federal Transportation Funding re-authorization at this time, we can only at best expect the program to be funded at its current level. The Department has adopted a "Maintenance First" philosophy in an effort to keep our good assets good and direct Capital Program funds more towards our heavily traveled "corridors". While this is not really anything new, a corridor driven program may potentially mean fewer projects will be let, as the cost of the individual projects is inherently high. In the meantime, there will be an increase in the number of "Maintenance by Contract" projects.

These challenges do nothing but further legitimize the need for our Association. The ability to have all of the players in the bridge industry (Owners/Operators, Consultants, Contractors, and Material Suppliers) meet on a regular basis in an informal setting to exchange ideas and information is paramount.

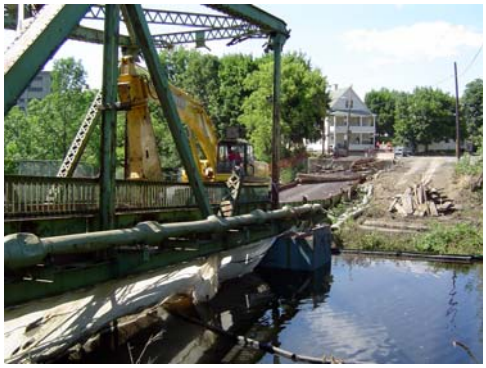
Happy Holidays and Best Wishes for the New Year,
Doug

President, Eastern New York Chapter – ABCD

Replacement of the Pulaski Memorial Bridge
Amsterdam, New York

Introduction

The replacement of the Pulaski Memorial Bridge was a Locally Administered Federal Aid Project for the City of Amsterdam and the New York State Department of Transportation – Region 2. The original bridge was built in 1931 and consisted of a 61.5 m (202 ft) long modified Warren Truss with riveted connections and Grade 30 steel. The deck was an open steel grating and the sidewalk was comprised of edge-lapped timber. There was a 305 mm (12 in) waterline suspended from the upstream fascia, a 200 mm (8 in) gas main suspended from the downstream fascia, a cable TV line and electric lines supported from the structure overhead. The structure was in the advanced stages of deterioration and was load posted for 14 tons. In 1998, temporary repairs were made to several stringers and floorbeams and additional stringers were placed to help distribute the loads to the floorbeams.



The bridge is located on Fourth Avenue over the North Chuctanunda Creek in the City of Amsterdam, Montgomery County. Fourth Avenue passes through a residential district and connects two tightly knit communities which are separated by the North Chuctanunda Creek.

Historical Context

Montgomery County was originally part of Albany County, until 1772 when Tryon County was formed which included all of New York State west of a line running due north from the Delaware River, through and along the eastern limits of the present counties of Montgomery, Fulton and Hamilton to the border of Canada. In 1784, a portion of this land which includes the present counties of Fulton and Montgomery, was renamed Montgomery County after General Richard Montgomery.

In 1785 Albert Vedder settled along the Chuctanunda and built a gristmill about 600 feet from its mouth, harnessing the Chuctanunda's power. Soon after, a sawmill, blacksmith shop and dwellings were erected along the water, and a hamlet was created called Veddersburg. Veddersburg was renamed Amsterdam in 1808. By mid-19th century, Amsterdam was growing and boasted a number of gristmills, sawmills, fulling mills, cording machines, trip hammers, distilleries, oil mills and asheries all benefiting from the power of the Chuctanunda. In 1854 Amsterdam was granted a village charter, but by 1885, it had outgrown this charter and a city charter was obtained.

Amsterdam was a major manufacturing city during this time period. Items produced included brooms, carpets, steel springs, linseed oil, pearl buttons, and knitted goods. The area surrounding the Pulaski Bridge was believed to be settled mostly with residents of Polish ancestry at the time the bridge was originally built in 1931. It was named after the Revolutionary War Hero, General Casimir Pulaski, who was of Polish descent.

Design

During preliminary design, several design alternatives were evaluated with the replacement alternative being selected. There were three replacement alternatives which were considered; simple span replacement 46 m (151 ft); 2 span continuous replacement 28 m – 32 m (92 ft – 105 ft); and 4 span culvert replacement. Each alternative was analyzed to determine which one would provide the maximum freeboard. The simple span and the 2 span structures were also analyzed using Grade 345 MPa (50 ksi) steel and Grade 267 MPa (70 ksi) steel to further reduce the overall structure depth. In addition to the beam depth restrictions, the roadway geometry at the bridge was considered to be poor, with substandard curves and sight distance. As part of this project, sight distance and horizontal curvature was significantly improved through the use of curved girders and four rail box beam bridge rail.

In order to minimize the amount of structural steel and the beam depths used on the bridge, high strength steel was evaluated in several girder configurations. The final design used 6 welded plate girders with a web depth of 1.47 m (58 in). The savings realized by using the high strength steel versus conventional steel was a reduction in total steel weight of 36,000 kg (79,400 lbs) and a reduction in the web depth of 15%.

The bridge was analyzed using a finite element modeling software to predict the lateral bending forces in the girders due to the relatively tight curvature, 165 m (541 ft). The lateral bending stresses contributed to the total bending stress by 17% and the maximum flange tip stress was 261 MPa (37.9 ksi).

Construction

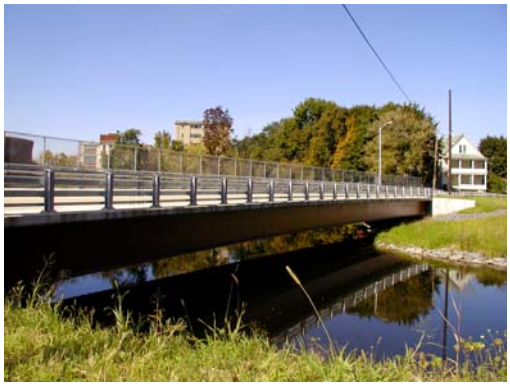
Demolition of the existing truss began in May of 2003. A temporary pontoon support was floated into place below the existing truss and removal of the truss began at the West abutment. As each member was removed with large steel shears mounted on an excavator, the truss rested on the pontoon so that none of the material landed in the creek. Once half of the truss was removed, another large excavator pulled the remaining portion of the truss towards the abutment using the pontoon as a floating support.

Substructure removal and excavation for the abutments began after the superstructure was completely removed. The East and West abutments were approximately 5 m (15 ft) high. The East abutment was founded on rock and the West abutment was founded on drilled shaft piles due to the varying rock elevations across the creek bed. Both abutments were completed in the fall of 2003 ready for the anticipated steel delivery at the end of September.

Due to the shortage of materials, the structural steel fabrication was not completed until the beginning of November and the contractor decided to prepare the site for a winter shutdown and take delivery of the steel in

the spring of 2004. The steel arrived at the site on March 30, 2004. Each girder was shipped in one piece and was supported on the delivery vehicles using temporary stiffening beams bolted to the connection plates on the girders. The girders were relatively slender due to the reduced depth and thinner high strength steel. This resulted in shipping concerns over the 300 + mile route from Lancaster PA to Amsterdam, NY. The stiffening beams were designed and installed by the steel fabricator to eliminate the possibility of overstressing and distorting the structural steel during its trip.

The six girders, diaphragms, bottom lateral bracing and utility supports were installed over a 3 week period. The deck was poured in May of 2004 and the sidewalks, guiderail and pedestrian fencing were installed in time for the bridge's grand opening on July 9, 2004.



The total construction cost was $1.662 million. The project team consisted of:

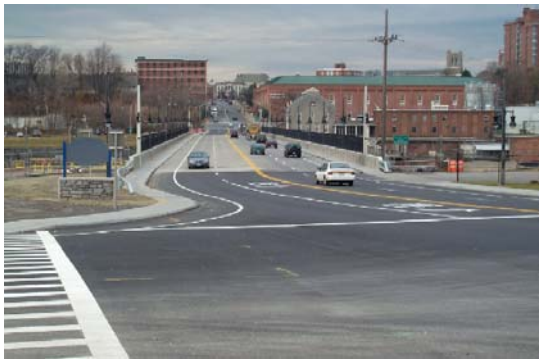
Owner – City of Amsterdam
Contractor – Delaney Construction Corporation
Demolition – Sessler Wrecking & Demolition
Steel Fabricator – High Steel Structures
Steel Erector – D.A. Collins Construction
Concrete Supplier – Clemente Concrete Latham
Piles – Buffalo Drilling
Designer – Earth Tech Northeast
Construction Inspection – Earth Tech Northeast

Submitted by Roger W. Laime, P.E., Earth Tech Northeast

Cooper's Cave Bridge Complete
By: Rick Gorton
Cianbro Corporation

After 3 years of construction the replacement of the Route 9 Bridge that spans the Hudson River between the city of Glens Falls and the village of South Glens Falls, New York has come to a successful completion. The $17 million bridge, which is owned by the New York State Department of Transportation, was delayed one year due to a third party utility delay.

Cianbro Corporation, the general contractor for the project, built the bridge proposing a Value Engineering Proposal. The VE proposal simplified the construction of the bridge by eliminating the use of a separate temporary bridge structure that was originally specified in the contract as a detour structure to keep traffic flowing along Route 9. Instead of using a separate temporary bridge, Cianbro Corporation devised a method to continue using the existing structure while building the new larger bridge in phases. The phased construction allowed for half of the new bridge to be constructed, which could then take traffic from the old bridge while the other half of the new bridge was constructed. Once both halves of the new four-lane bridge were built they were joined together completing the new wider bridge.



The new 700 ft four-lane bridge consists of eight plate girders, three piers, and two abutments with a maximum span of 225 feet. Decorative lightpoles and ornamental steel picket railing complement the local architecture. This area is home to *Cooper's Cave* made famous by James Fenimore Cooper in the story *The Last of the Mohicans.* The project also included the construction of a scenic overlook and a pedestrian bridge to educate visitors about the history of Cooper's Cave.

Approximately 3.3 million pounds of structural steel and nearly 4,000 cubic yards of concrete were used in the construction of this landmark bridge. Officially dedicated as the *Cooper's Cave Bridge*, this structure will continue to serve this important river crossing. The project was administered by NYS DOT Engineer In Charge, Steve Prescott.

The Six Phases of a Project

1. Enthusiasm
2. Disillusionment
3. Search for the Guilty
4. Punishment of the Innocent
5. Praise and Honors for the Non-Participants

submitted by the Unknown Joker

Editor's Note: We are seeking engineering stories for future publications. Special thanks to Frank Naret and Maggie for putting this newsletter together.

Any comments that you feel could improve or enhance this newsletter should be sent to the Editor, Scott Davis.

ABCD Profile
Dan Rogers

Dan Rogers has been involved with the ENY Chapter of ABCD since its inception and has served on the Board of Directors and the Program Committee. Dan recently announced that he will retire from Ryan-Biggs Associates effective December 31, 2004. However, Dan doesn't plan on completely leaving the realm of bridge engineering as will serve as a part-time consultant to Ryan-Biggs.

Where did you receive your educational training?
I received a B.S. in Physics/Engineering from Washington and Lee University in Virginia and a M.E. in Civil Engineering from Rensselaer Polytechnic Institute.

How long have you worked for your current employer?
I've been with Ryan-Biggs Associates for almost 23 years, after about 11 years with NYSDOT.

Any memorable bridge projects over your career you would like to mention?
NYS Route 29 over the Batten Kill in Middle Falls, New York: A precast (three 60-foot-long segments) post-tensioned concrete I-girder bridge with a clear span of 180 feet. It was one of the earliest examples of this type of construction in New York State.

NYS Route 169 over the Mohawk River in Little Falls, New York: A four-span continuous curved steel girder bridge with unique concrete PI-piers.

Pawling Avenue over the Poesten Kill in Troy, New York: Rehabilitation of a historic two-span, stone arch bridge while maintaining traffic across the stream using an on-site detour structure.

Low's Covered Bridge in Sangerville, Maine: Replacement of a historic timber covered bridge that was destroyed by a flood with a new timber covered bridge that replicated the original bridge as closely as possible but that provided additional load-carrying capacity.

What influenced you to become a bridge engineer?
My work during the summer of 1970 on the field instrumentation and load testing of curved steel I-girder bridges as a junior engineer for the NYSDOT Engineering Research and Development Bureau was very interesting and challenging and lead to my initial interest in bridges and "career" with NYSDOT.

What do you see as the biggest change in bridge engineering over the last ten years? How about the next 10?
Last 10 years: 1) Vast improvements in powerful computer analysis and design software and implementation of LRFD for bridges. 2) Development of high-strength concrete and steel used in bridges.
Next 10 years: Increased use of FRP composites to rehabilitate and reinforce existing bridges.

Any special hobbies/interests outside of bridge engineering?
Cooking, wine tasting, choral singing, and volunteering with community service and church groups including mentoring students through STEM.

Upcoming events

Engineers Week Program
Thursday, February 17th

www.abcdeny.org

2004-2005 Key Contacts

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