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# POLISH-AMERICAN ENGINEERS ASSOCIATION

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All members and friends of Polish-American Engineers Association are cordially invited to attend our May 2012 meeting.

**DATE:** Friday, June 15th, 2012

**TIME:** 7:30 p.m.

**PLACE:** Copernicus Center  
Kings Hall  
5216 W. Lawrence Avenue  
Chicago, Illinois

**SPEAKERS:** Joseph Glennon, PE  
Project Manager/Senior Associate

Robert J.Q. Hong, PE, SE, P.Eng.  
Sr. Structural Engineer/Assoc.VP

Janusz Wielgos  
LOCHNER

**TOPIC:** North Halsted Street Bridge over Chicago River North Branch Canal



**Josep Mr. Joseph Glennon, PE**, is a Senior Associate in Lochner's Midwest region. Mr. Glennon has 28 years of structural and civil engineering design experience with 20 of those years managing transit projects involving roadway, railroad, bridges and transit station buildings, under aggressive schedules and a variety of contracting methodologies and to successful completion.

Mr. Glennon's civil design experience includes developing plans for maintenance of traffic, sewer, water and other utilities reconstruction, roadway reconstruction and ADA improvements, design of railroad and roadway horizontal alignment and vertical profiles, staging and temporary runaround; structural experience includes design of pedestrian and roadway bridges, retaining walls and other structural elements. Recent clients include City of Chicago, IDOT, Metra, CTA, Cook County, and Kiewit

Mr. Glennon was the project manager for the design of the N. Halsted St. Bridge over the Canal.



**Mr. Robert Hong P.E. S.E.** is a Lead Structural Engineer and Project Manager in H.W. Lochner's Chicago office with more than 17 years' structural design experience. Specialty areas of structural analysis and materials include pre-stressed, post-tensioned, accelerated bridge construction, seismic analysis, and slurry wall and secant pile wall design. Mr. Hong also has extensive design experience with various bridge types including railroad, cable stayed, truss, moveable, and tied arch bridges. Mr. Hong has served as a lead structural engineer in numerous large, multi-disciplinary projects and Design-Build pursuits. These projects serve local clients such as CDOT, IDOT, Metra, and ISTHA in addition to transportation clients nationwide.

Mr. Hong was a lead structural engineer for the design of the N. Halsted St. Bridge over the Canal.



**Mr. Janusz Wielgos** is a Roadway Design Engineer in Lochner's Midwest region. Mr. Wielgos has 13 years of civil engineering experience.

Mr. Wielgos's expertise includes Phase II design which includes generating roadway plan and profile sheets, horizontal and vertical alignments, staging and traffic control, signing, intersection design, parking facilities, detour planning, traffic signal timing, quantity take-offs, specification development, utility review and quality control. Recent clients include City of Chicago, IDOT, and Metra.

Mr. Wielgos was the project engineer for the design of the N. Halsted St. Bridge over the Canal.



**The North Halsted Street Bridge** over the Chicago River North Branch Canal was constructed in 1909 as a Bascule Pratt Through-Truss. The existing structure is 301.2ft long and 60ft wide. The existing superstructure is steel grating supported by steel truss (on movable portion of the bridge) and reinforced concrete deck slab and steel deck beams on the fixed spans. The substructure consists of reinforced concrete wall piers and reinforced concrete abutments. In 2007, the existing bridge had a Sufficiency Rating of 25.9 out of 100, deck, superstructure and substructure condition ratings of poor (4 out of 9) and was also structurally deficient. The Chicago Department of Transportation

retained the engineering firm H.W. Lochner to design a replacement bridge.

This presentation will discuss the design approach of the replacement bridge, consisting of the Main Span Simply Supported Tied Arch with North and South Three-Sided Precast Concrete Underpasses, retaining walls and cofferdams. The replacement bridge design started in 2008, construction in 2009 and was opened for use on December 21, 2011.

The bridge superstructure is a parabolically shaped steel tied-arch. The length of the new bridge is 156'-8" back to back of abutments with no skew. The superstructure is a simply supported tied arch bridge with 10" deep structural deck slab, AASHTO M270 Gr. 50W 42" composite bolted, built-up steel tie box girders, welded, built-up steel box arch ribs, welded, built-up steel box rib bracings, welded, built-up steel composite floor beams, and ASTM A586, Class A/C structural strands. The width of the deck is 80'-4" out to out, 54'-0" face-to-face of curbs with two 9'-6" sidewalks. A 3-D structural analysis was performed for the main span structure

to capture the significant unsymmetrical lateral flexure and torsion behavior for the structure subjected to vehicle moving live load, wind load and unsymmetrical pedestrian live load.

The abutments are closed abutments supported on piles driven to bedrock. The bottom of the abutments was constructed at 17' below the water surface. This required the construction of temporary cofferdams to construct the abutments "in the dry". Based on the loads anticipated, and soft soil conditions encountered near the river bottom surface, the abutment and piers were supported on steel HP-piles extended to refusal on bedrock. This issue, and the existence of the applied loads from the tied arch bridge at two locations close to the ends of each abutment, with the lateral loads behind the abutments and surcharge, required the use of a 3-dimensional finite element analysis (FEA) to find the applied axial loads, moments, and shears on the abutment stem, pile cap and piles.

The portion of the existing abutments interfering with the three-sided precast concrete underpass foundation mat was removed. The existing and remaining portions of abutments were extended to cover the area between the wingwalls. The three-sided precast concrete underpass foundation mat was dowelled and supported on the top of the remaining abutments and their extensions.

All retaining walls were designed as Cantilever Retaining Walls with footings supported on Steel H-Piles. A temporary cofferdam system was installed at both North and South Abutments. The cofferdam height was designed according to Estimated Water Surface Elevation (EWSE) which was used to evaluate the need for underwater structure excavation protection. Depending on Loading Conditions, the use of wales and/or seal coats was included in the design.

### **Administration Updates**

Our **Picnic** will be held at the Fourth Lake resort on July 28th. Please reserve this date. More details will be forthcoming. As usual Our Social Director Rene Pietrzyk will emcee this ever-popular event.

We would like to offer sincere congratulations to Tad Hofkin, Mirek Noyszewski, Dr. Ron Wolosewicz and Roman Korczak. A more contemporary **Constitution and By-Laws** developed by the four above dedicated members of PAEA was unveiled and is being balloted by membership. All members in good standing are encouraged to exercise their voting prerogative and cast ballot.

Reminder to all members and sympathizers. Ralph Modjeski **scholarship applications** should be turned in by qualified students of engineering by June 15th. Six scholarships will be awarded.

We were advised by Dr. Jan Plachta that on May 14-15th he participated in **A Third Annual Ralph Modjeski Bridge builder Symposium** which was held in Bydgoszcz. Symposium was organized by Bydgoszcz University of Technology and Biology. Professor Andrzej Nowak attended with a number of his PhD candidates currently studying at University of Nebraska. John Kulicki, CEO of Modjeski and Masters was a special guest at the symposium. Dr. Plachta spoke about the Historic Rock Island Bridge on Mississippi River.

**P.A.E.A. MEMBERSHIP DUES.** If you are late with your dues please remember to send us your check. Dues are \$50 per year, senior citizens and students \$25 per year. Questions? 2012 membership cards will be provided to all those who paid their dues. You may send an email to: [paea.info@gmail.com](mailto:paea.info@gmail.com)