Orleans County successfully completed administration of a federal aid project funded by the Federal Highway Bridge Program, New York State Marchiselli, and Orleans County funds to replace a structurally deficient bridge. The project was designed to provide a replacement structure that will require limited maintenance throughout its life, thereby providing economic value to the County. Challenges overcome through the planning, design, and construction process include:

- Preparation and justification of the preferred alternative
- Private utility coordination and relocation
- Environmental permitting and wetland delineation
- Project delay due to lack of federal funding
- Stringent construction schedule due to a construction season stream restriction
- A “No Effect” SHPO concurrence within an archeological sensitive area, and
- Right of way acquisition

As the owner of the structure, the Orleans County Highway Department guided the project from inception through construction. NYSDOT Region IV was involved to provide guidance for following state and federal standards in accordance with the Procedures for Locally Administered Federal Aid Projects. The project was planned and designed by Clark Patterson Lee and constructed by Ramsey Constructors.

The project involved the replacement of a two-span steel jack arch superstructure founded on concrete abutments and piers with a precast concrete Bebo Arch structure supported on new reinforced concrete footings.

The new structure was located to maintain the same horizontal and approximately the same vertical highway alignments. The structure has a clear span of 77.8’, a height of 21.8’, and out-to-out width (travel lanes, shoulders, and headwalls) of 33.99’. Precast headwalls and wingwalls were constructed along the arch fascia and at the four corners of the structure to retain roadway embankment fill.

(See “Knowlesville Road Bridge Replacement” continued on page 2)
Knowlesville Road Bridge Replacement (continued from page 1)

During the planning phase of the project a scope summary memorandum was prepared detailing alternatives which were considered for remediation of the existing structure including rehabilitating the existing bridge, replacing the bridge with a single span multi-girder structure, and replacing the bridge with an arch type structure.

The arch replacement alternative involved completely replacing the existing structure with a reinforced concrete arch-type structure on reinforced concrete footings bearing on bedrock. Due to the topography of the site consisting of a relatively large span and rise, the geometry of a buried arch type structure was anticipated to fit well.

Widely known as a structurally sound and efficient shape, a buried arch structure was considered also because of the aesthetic appearance in an area utilized for recreational activities during the summer months. In addition, a buried structure is generally known as a virtually maintenance free structure. The arch structure was detailed as a twin leaf precast concrete structure with associated precast concrete headwalls and wingwalls to minimize on site construction duration. The final construction cost of $1,360,000 was 98% of the preliminary design engineer’s cost estimate.

This type of twin leaf precast structure and associated tall precast mechanically earth stabilized style headwalls and wingwalls have been utilized in a relatively low number of transportation projects throughout the state. The precast walls minimized the amount of on-site formwork needed and enabled placement of the walls and the commencement of backfill operations without a curing process. The relatively new system based on a long history of arch type structures presented challenges for Ramsey to overcome, including working through inclement weather, adverse site conditions, and unfamiliarity with construction methods. Despite these challenges, along with a stream restriction during the prime construction season, work was performed effectively and the project was completed on schedule. (continued on page 3)
Installation of first headwall unit

Project Team

Chris Sichak of Clark Patterson Lee was the project manager for the project design and construction inspection services. Ron Centola of Clark Patterson Lee served as the Principal-In-Charge. The Resident Engineer on site during construction was Lisa Barrett of Clark Patterson Lee.

Bill Adams of Ramsey Constructors, Inc. was the contractor’s project manager while Jim Kuhn and Jim Farrell of Ramsey shared duties for on-site Superintendent. Contech Construction Products, Inc. was the supplier of the precast structure and associated precast wingwalls and headwalls. Lakelands Concrete Products, Inc. fabricated the precast concrete elements.

This article is only a small part of the APWA 2010 Awards nomination package prepared by Chris Sichak of Clark Patterson Lee, Rochester, NY. For the complete package, including many more photos, email him at csichak@ClarkPatterson.com, or contact PCANY.

Select structural fill over geogrid reinforcement

East Facia Bracing

Installing Last Headwall Unit

Finished Structure
Member News

A Hearty Welcome to new Associate Member Dimension Fabricators, Scotia, NY, Joel Patrie, Production Manager, and to New Professional Member Clark Patterson Lee, of Rochester, NY, Chris Sichak, P.E., Senior Associate.

And congratulations to two Passero Associates for passing their Professional Engineer Exams, and subsequent licensing: Jess Sudol and Lauren Monaghan.

A.L. Patterson, Inc. is pleased to announce Mr. Skip Francies has joined their company as President of the newly formed ALP Precast Division.

Spillman Company announces a new brochure on Custom Forms and another on new Plastic Spacers, plus the reintroduction of 17 models of locking Plaswheels. Find them at www.spillmanform.com