New Jersey Treasury Department - Division of Building and Construction

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20-20 Hindsight

As with most complex projects, all the project partners had a greater appreciation of the project upon its completion. Following is a listing of post construction "20-20 hindsight" comments as well as thoughts on improvements for future designs.

- A common question by reviewers of draft copies of this case study was why were the tower poles embedded in the soil as opposed to being mounted on concrete pedestals atop a concrete footing. The second alternative, as used in the USDA White Mountain National Forest, may result in a more durable structure or at least the concrete foundation can be re-utilized as is the case with the Hastings Trail Bridge. The answer is that the construction of the towers and foundation was performed by volunteer workers from GPU Energy and the NY-NJ Trail Conference. The construction was centered around a very short construction window utilizing GPU Energy standard procedures. Mounting non-uniform circular poles on an elevated concrete pedestal or wall is not standard utility company practice. Embedded utility poles have an effective life of 25 years or more. A concrete pedestal system should be considered if project resources allow.
- Attaching a 30-inch or 36-inch diameter reinforced concrete septic tank cover to the base of the tower poles with a lag screw would have increased the basal bearing area of the poles in the soft soil. This would have assisted when the poles were installed on a temporary basis.
- The exposed end grain at the top and bottom of the poles should have been sealed. This could be something as simple as bituminous roof tar with a plastic bag or more sophisticated like the coatings used on marine pilings.
- It should be investigated to see if a bridge socket can be attached directly to the square shaft of a Chance® Helical Anchor. This would simplify the anchorage attachment.
- The pros and cons of the various suspender configurations or combinations thereof as discussed on pages 60-63 should be considered.
- If a swaged threaded rod is used in the suspender assembly, such as in the Pochuck Quagmire Bridge, incorporating the rod as a component of the stiffening truss would be a major improvement.
- The Pochuck Quagmire Bridge stiffening truss does not act as an ideal load distribution member when a point load is directly over a cross-stringer. This could be remedied by making the suspender connections at the top of the stiffening truss, but this would be at the expense of the simple and effective cross-stringer connection.

- If possible, keep the cable saddles simple and uniform.
- Two-inch by six-inch decking was used on the Pochuck Quagmire Bridge. A suitable alternative is 1 1/4-inch by 6-inch decking. Using 2-inch by 4-inch dimensional lumber with a healthy gap would improve the aerodynamics of the walkway deck. For very long bridges or bridges in a windy location, open grating should be considered for the walkway.

Conclusion

The primary project goal of providing a safe, practical, durable, cost-effective bridge over the Pochuck Creek in order to relocate the Appalachian Trail from a dangerous 2.1 mile roadwalk into the protected trail corridor was achieved.

A cost-effective and practical design meeting all the project goals, as well as the limited resources of the project partners, was prepared. The Pochuck Creek was spanned by using common construction material in a creative and innovative manner. The construction was implemented by a unique public-private partnership. The primary project goal of providing a safe, practical, durable, cost-effective bridge over the Pochuck Creek in order to relocate the Appalachian Trail from a dangerous 2.1 mile roadwalk into the protected trail corridor was achieved. Other benefits or technical items demonstrated by this project are as follows:

- The bridge is a very visible and effective demonstration of modern timber bridge technology on a National Scenic Trail.
- Design standards for timber pedestrian suspension bridges were investigated. This project and case study publication has initiated a nationwide dialogue among engineers with an expertise in small scale suspension bridges. This technology transfer will benefit the public.
- This project documents that utilization of CCA treated lumber for bridges is not limited to short-span stringer bridges or truss bridges. This project clearly shows long-span lumber walkway suspension bridges are practical. This shall add to the recognition of CCA lumber as a proven construction material.
- The project introduced Chance® Helical Anchors and geogrid to the Appalachian Trail as alternatives or enhancements to traditional foundations. These are especially useful in environmentally sensitive areas or projects with poor access.
- The project shows that the Americans With Disabilities Act design standards can be attained in a cost-effective, practical manner, even in a remote, difficult location.
- A major project can be constructed with minimal environmental impact.
- The project initiated a meaningful dialogue and partnership between the USDA Forest Service, NJDEP, the Appalachian Trail Partners, and the local community.
- The rustic bridge complements and blends with the primitive Appalachian Trail experience.
- The design and construction followed a "conservation ethic" by utilizing donated and previously purchased material as well as the in-house talents of the project partners.