Route 27A Drainage Improvements
Village of Brightwaters, Suffolk County

Project Description

The Village of Brightwaters has recently seen improvements by the New York State Department of Transportation (NYSDOT) to eliminate flooding in the area. Within this area are NYS Route 27A (Montauk Highway), a pair of gazebos in an open field used for the town fair, a historic monument dedicated to the founder of the Village of Brightwaters, and a crumbling arched weir and spillway (replaced by this project) that were built by early settlers of the village.

A drainage study encompassed a large watershed area which included several lakes, culverts, weirs and a limited positive drainage system. Drainage into the lakes and culverts connected to the outfall through the timber bulkhead of the Brightwaters Canal. The existing drainage system on Montauk Highway was found to be inadequate due to its age, the high water table and an insufficient number of drainage inlets. The existing weir/culvert system that carried the outflow from the lakes and across Montauk Highway was also found to be inadequate. These deficiencies were determined to be the cause of the reported flooding, and the project was created to correct them.

Coordination, Outreach & Partnering

Local residents and representatives were contacted early in the project planning phase to identify any concerns they might have. It was determined that the Mayor and the Village Board of Brightwaters were responsible for handling such concerns. Comments from the Village Board were sent to NYSDOT through the village Superintendent of Public Works.

Any potential changes to the appearance of the spillway were found to be their primary concern.

In addition to satisfying SHPO’s and the Village Board’s requirements, additional measures were taken to ensure that the work done in the area enhanced the area’s appeal.
The existing spillway provided both the sound and appearance of a waterfall. The Village Board desired this to be replicated in-kind. Six potential spillway formations meeting the required hydraulic capacity were devised for the Board to review. Rather than fully endorsing any one of the six designs, the Board requested that the new weir and spillway should resemble the existing ones. Ultimately, the new weir was required by the State Historic Preservation Office (SHPO) and the village board to be designed with a similar arch formation, covering basically the same footprint. The proposed arch was designed to reflect the character of the existing arch as much as possible, given the design constraints.

NYSDOT received direct feedback about the various proposed designs and construction activities from several residents. The owner of Ackerson Realty, who is a direct descendant of the founder of the Village, provided family and historical information pertaining to the Village. Ackerson Realty, located just south of the Lower Cascade Lake, was also the building located closest to the construction zone.

The village Engineer was helpful in providing plans and details of construction work in the area that was sponsored by the Village. This included details of the existing timber bulkhead and the recycled plastic lumber bulkhead that the Village intended to use to replace it.

Other organizations involved in the design and coordination of the project were the US Army Corps of Engineers, NYS Department of State - Division of Coastal Resources and Waterfront Revitalization, FHWA, US Fish & Wildlife Service, New York State Department of Environmental Conservation (NYSDEC), New York State Historic Preservation Office (SHPO), Bell Atlantic/ NYNEX, Cablevision, LILCO, the Suffolk County Water Authority and the Suffolk County Department of Public Works.

Project Highlights & Successes

In addition to satisfying SHPO’s and the Village Board’s requirements, additional measures were taken to ensure that the work done in the area enhanced the area’s appeal.

There is a scenic walkway between the Upper and Lower Cascade Lakes, just south of Montauk Highway. This walkway is aesthetically designed to be raised slightly above the lake surfaces. The proximity to the water is important to the walkway’s visual experience. The walkway would have an awkward appearance if the lake surfaces dropped significantly. Conversely, the walkway could be flooded if the lake surfaces rose. The proposed weir would therefore have to be designed to maintain the lake surface levels as much as possible.

At least one panel of the existing wooden bulkhead at the end of the Brightwaters Canal needed to be replaced to accommodate the end of the proposed concrete box culvert. Several panels on the end of the bulkhead were found to be deteriorating rapidly. The soil behind the old wooden bulkhead was passing through cracks between the boards, leaving voids and forming sinkholes behind it. It was decided that the entire north end of the bulkhead was in need of replacement, and this work was added to the project.

Before this project was initiated, the Village of Brightwaters had begun the first phases of a plan to gradually replace the entire canal bulkhead. To improve resistance to salt and weathering, the
Village used recycled plastic lumber, a material only recently available. When NYSDOT began preliminary design of the new bulkhead, the benefit of eliminating the need for the Village to reconstruct work done by the State was considered. When the material was evaluated, it was found to be suitable for bulkhead panels. The color of recycled plastic that the Village had previously used for bulkhead replacement was specified for the bulkhead panels replaced in this project.

The original culvert crossed diagonally beneath Montauk Highway to carry the necessary base flow from the lakes. This base flow is a relatively constant volume of water that must exit the Lower Cascade Lake to compensate for the small amount of water entering the lakes from various parts of the watershed.

Many years ago, when the road was widened and the open area for the gazebos was created, a corrugated metal pipe was added to the culvert to carry the water to the canal. This pipe was laid with a sharp angle, however, which reduced the maximum capacity of the system. Flooding occurred on the upstream side of the culvert during periods of heavy rainfall. The placement of the new weir/spillway to the east of the previous one provides a more direct path between the lakes and the canal. Although the new culvert is also angled to avoid any impact to the gazebos, it is larger and has fewer severe angles, improving its capacity.

The lakes are populated by numerous fish. The lakeside also serves as a stopping point for migratory birds, some of which remain during their mating seasons. It was decided to prohibit work on this project during the times of the mating and spawning seasons to reduce the chance of any adverse affects to the birds and fish.

The quality of the water entering the Brightwaters Canal was also a concern. The limited positive drainage system channeled the water from much of the road directly into the canal. Salts and sand spread on Montauk Highway for vehicular safety in winter were carried into drainage systems by the first rain that falls (the first flush) in the area. NYSDEC recommended that, as much as is feasible, this first flush should be prevented from entering the canal. Due to the high water table, it was necessary to create a new shallow form of leaching basin to collect and temporarily hold this contaminated runoff. The remaining runoff would exit the basin, pass to the culvert and, finally, to the canal. After the rainstorm, the remaining water in the basin would leach into the soil leaving the sand and some salt behind.

Due to the high water table, dewatering operations were necessary during most
construction activities. The water that was pumped away from the excavations contained soil particles. To remove these particles before discharging the water to the canal, the water was deposited into a pair of sedimentation tanks which removed most of the heavier particles. The water was then passed through several filter cloths before being discharged into a catch basin which leads to the canal.

In August of 1925, the Village of Brightwaters erected a monument in honor of Thomas Benton Ackerson, the founder of the Village. The monument is a bronze plaque mounted on a boulder by the edge of the lower lake facing Montauk Highway. Inscribed on the boulder are the words “Ackerson’s Rock”. This project was planned to avoid any impacts to the monument, and a protective fence was placed around it and nearby vegetation during construction activities.

To preserve the scenic quality of the Brightwaters area, a great deal of care was required. The existing vegetation in the area ranged from small ground cover plants to medium-sized trees. If the area of the existing spillway was simply covered with grass, it would appear incongruous with the surrounding vegetation. A Landscape Development Plan was created to ensure that appropriate amounts and kinds of vegetation were to be included in the final layout. Where it was not in conflict with construction activities, the existing vegetation was preserved or replaced with similar plantings.

After receiving comments from the Village Board, it was necessary to create a new weir design that conformed to the Village Board’s requests and also allowed the required peak stormwater to pass. The final design provides for an arch nearly as small as the former one to allow for a continuous flow of water down the spillway without draining the lakes too quickly. Unlike the former design, however, the new design allows for peak drainage flows by including areas for water to flow outside the arch. The water will flow over these areas during and immediately after rainstorms when the lake surface rises, and allow much greater exit flow before the Lower Cascade Lake can overflow its banks. In combination with the larger culvert size, the new weir design will prevent flooding in this area for many years to come.

Region 10’s nomination of this project for excellence in Context Sensitive Solutions originated with the Regional Director’s request for recommendations. This year, it was decided that the Region would concentrate on smaller scale projects that showed our commitment to context and community sensitive design. This criteria resulted in a list of five significant projects selected by our Region’s Context Sensitive liaison. Each of these was then reviewed by our Regional Design Engineer and then the Regional Director who made the final selection. We feel that the Region has selected a project that exemplifies our dedication to context sensitive solutions and community involvement illustrated at a smaller and more local scale.

This project’s design team is being nominated for a REAP award in recognition of this exemplary
accomplishment. After the Context Sensitive Solutions award process has been completed, it is the intent of this Region to follow-up with a regional news brief describing the project and its Context Sensitive Solutions nomination. Illustrations of this successful project will be included in a Regional Context Sensitive Solutions Power Point presentation with credit given to the team.

**Responsible Individuals**

Project Manager: **Kuros Sorbi**  
DOT Design Unit II Personnel:  
  **Vinicio Lora, Steven Chapin**  
Environmental: **Darrel Kost**  
Landscape Architecture: **David Barnes**  
SHPO: **John Auwaerter**  
Deputy Regional Permit Administrator, DEC:  
  **George Hammarth**  
Mayors of the Village of Brightwaters:  
  **Robert L. Cox, Joseph A. McNulty**  
Superintendent of Public Works - Brightwaters:  
  **Harry L. Weed II**  
Village Engineer - Brightwaters: **Daniel Falasco**  
Construction EIC: **Charles Maass**  
Context Sensitive Design Nomination Package:  
  **Kuros Sorbi, Steven Chapin**