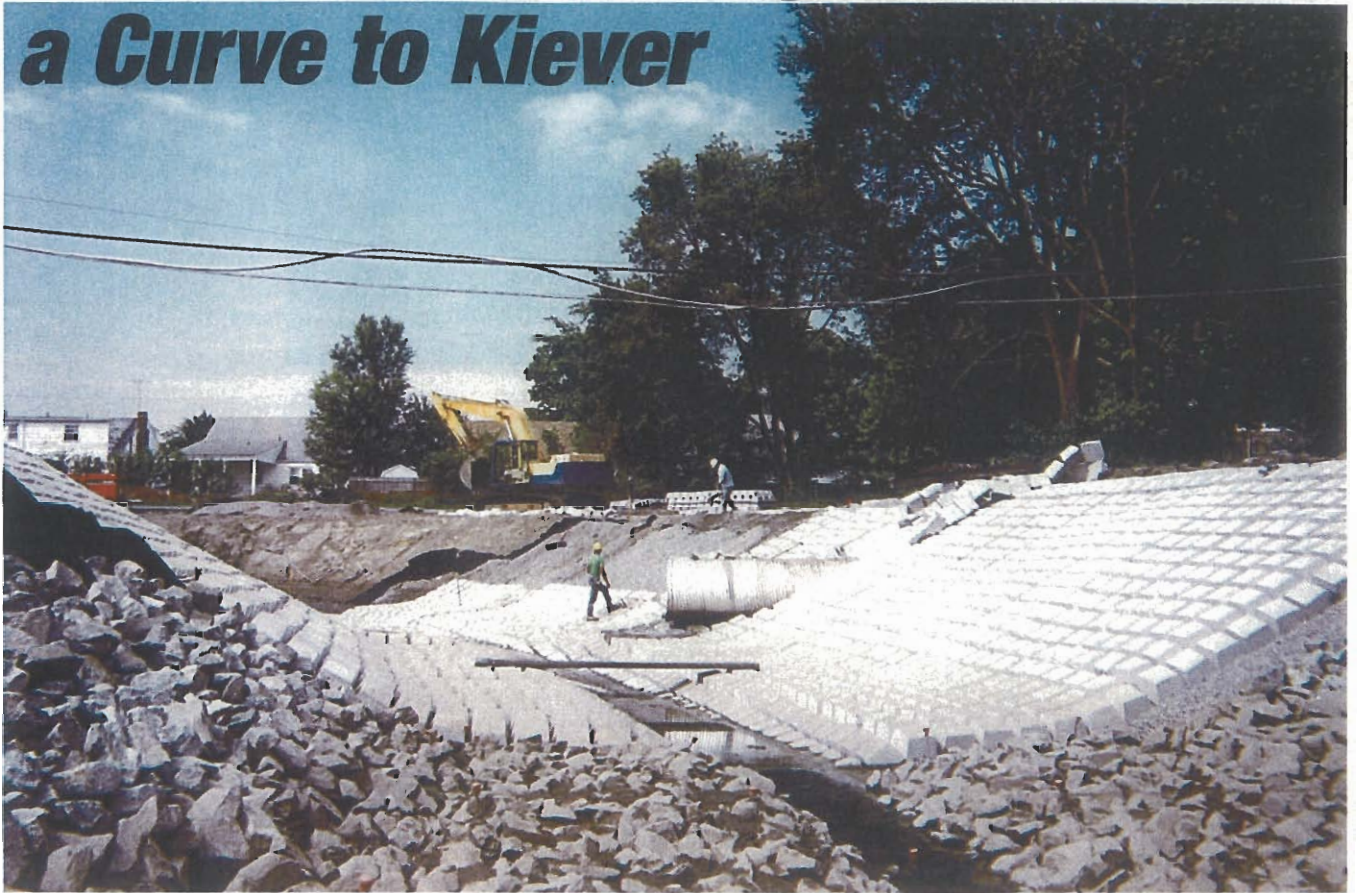


Erosion Control Project Throws a Curve to Kiever



Contractor performs unique installation of Bethlehem Pre-Cast's cable concrete mats

▲ While Dex Inc. covered most of Molly Ann's Brook with riprap, the Army Corps of Engineers required Kiever Enterprises to install cable mats supplied by Bethlehem Pre-Cast at a 90-degree angle.

Molly Ann's Brook was once a dirt channel, collecting water from the New Jersey towns of Totowa and Paterson and draining it into the Passaic River. And like many others, these two municipalities contain a mix of residential and non-residential neighbors. For many years, this brook effectively served the town. With the increase in building projects, however, the increased flow through the channel became too heavy.

Imagine coming home from a hard day's work to be greeted by a three-foot-deep body of water in your backyard and a flooded out basement. Not a pleasant thought. This scenario was commonplace at one time for some homeowners whose properties were situated at the infamous 90-degree curve of the brook, which is a straight run for the most part.

That was, until the Philadelphia Division of Army Corps of Engineers decided it was time for action. In response, a \$4.7 million contract was

awarded to environmental contractor Dex Inc., West Berlin, NJ, to control erosion and increase the capacity of the brook in order to prevent flooding.

Approaching Things from a Different Angle

While Dex coated most of the 1,400 linear feet of brook with riprap, the previously mentioned 90-degree angle was approached differently.

At this angle, water flow was the heaviest and erosion was an issue. In light of this, the corps **spec'd** in the use of Bethlehem, Pa.-based Bethlehem Pre-Cast's CC70 cable concrete mats. Recommended by Bethlehem-the manufacturer and distributor for the product in New Jersey, Pennsylvania and Delaware-to handle this aspect of the job was Kiever Enterprises of White House Station, NJ-a contractor with a good track record for installing these mats under similar, if not more difficult, conditions. Kiever's \$110,000 contract entailed the installation of 288 mats in an 18,432-square-foot area.



◀ From the top of the bank, a Komatsu PC200 excavator prepares the subgrade while another spreads three-quarter-inch clean stone.

There were a couple options to for the corps to consider prior to starting this job. First, they could have used riprap. According to Phil Keener, Kiever's project manager, riprap was installed at one point, but became displaced during a major storm.

Another option was the gabion basket system. Unfortunately here, the whole basket could break if the wire was to fail—a consequence highly possible due to the pressure of water flow in this section.

Increasing the Capacity of the Brook

A good portion of the job entailed the preparation of the brook prior to the actual installation.

After Dex had performed major asbestos removal from the banks, Kiever built them up higher and increased the depth. Actually the job called for the import of approximately 600 cubic yards of dirt. The carving of the channels was accomplished with two Komatsu PC200 excavators and a D37LT dozer and transportation of materials around the site was accomplished with a Komatsu WA250 wheel loader.

The Cable Mats

The CC70 mats used were four-feet-by-16-feet. Each of the 36 blocks—weighted to suit the application—are interlocked with stainless steel aircraft cable.



"We've used cable concrete mats a number of times and always had great success with them," Keener says assuredly. "This is a great product."

Laying Down the Law with Cable Mats

"These mats are a easy to set once the subgrade is prepared properly," Keener says.

While the ideal tool for performing a job of this nature would have been a crane, this was not feasible due to a high-tension wire running across the site. Nevertheless, Kiever's Komatsu PC200 excavator team proved to be the right tool for the job, installing upwards of 35 mats in a single day.

A custom-made lifting attachment—the spreader bar—was supplied by

▲ The corps speced a six-inch layer of three-quarter-inch clean stone to serve as filter material.

Bethlehem to offload and install the mats. Attached to the bucket of the excavator, the spreader bar hooks up to both ends of the mat. Prior to being set in place, the mats are then aligned between a centering mark on the mat and lines drawn on the subgrade.

Securing the mats is a second follow-up crew that bolts the section in place. For the sections along the top of the banks, an anchor trench is excavated. The two-block section of the mat that rolls over the crest of the bank is then secured with a duckbill anchor. At that point the trench is backfilled, and each side of the mat is



► The PC200 accommodated a spreader bar to place each cable mat.



◄ Once the water level had lowered, an excavator installed mats from the bottom of the brook.

cable clamped. Following the installation process, the surface is covered with topsoil and seeded. And within three years, the installation will be disguised by grass.

In a typical application, these mats would have been set—filter fabric attached—directly on top of virgin soil. But this was also not your average job. Instead, the corps sped the filter fabric to be three times the weight and unattached. And rather than placing the material on virgin soil, the corps required the subgrade to be cut and coated with a six-inch layer of three-quarter-inch clean stone (supplied by Mount Hope Rock Products, Wharton, NJ) for filtering purposes.

The corps also required that the

mats use a thicker cable, which made the installation a tougher project since compressing the mats and trying to adjust them would be more difficult as a result.

Keeping with the Flow

Obviously water control was a big factor on this job. Water control or not, crews worked in muddy conditions on a daily basis. In the beginning of the job, the pumps were allowed to run 24 hours a day, eliminating any increase in depth. However, after noise concerns arose among the neighbors, the pumps were to be shut off at the end of the workday thereafter.

This created a drastic change in working conditions for Kiever. Upon

entering the site in the morning the crew was greeted by a water level of about five feet. As the pumps caught up, the contractor would take a hopscotch-like approach, strictly working from the top of the banks until the water level dropped.

While a dam constructed at the top of the site slowed down the water flow somewhat, the bulk of water in the work area was controlled with two six-inch and two two-inch Flyte pumps.

Striving for Perfection

"I'm a perfectionist," Keener admits. "You can put these mats down any way, but it won't look good. But when you line it up nice and straight like a checkerboard, it really looks great. The key to a nice job is subgrade preparation"

As promised to the neighbors by Kiever, the section was completed on July 3, 1998, so as not to affect their Fourth of July festivities.

Kiever Enterprises is a civil contractor specializing in erosion control, roadwork, facilities construction and pipework.

Project files and specifications regarding cable concrete can be viewed online at:

www.bethlehemprecast.com ♦