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Ganging up on a Complex Formwork Problem Nassau County, N.Y.



**Focus on:
CONCRETE**

Ganging up on a Complex Formwork Problem

Ulma Form Works helps DeFoe Corporation overcome intricate formwork design issues with Megaform Gang Form System on LIE widening project

By **Brian Fraley**

The official change to metric measurements on highway projects is sweeping across the nation. Some contractors invite the change. Most cringe at the thought of it. But there's no debating the fact that the change can often cause job site discrepancies, as it did for DeFoe Corporation of Mount Vernon, N.Y.

DeFoe rented the Megaform gang form system from Hawthorne, N.J.-based Ulma Form Works Inc. Ulma's claim to fame is that it's "the only Euro-system in feet and inches."

Jorge I. Calvo, president of the company, believes this is a plus since many contractors have not warmed up to the metric concept. A couple states that have switched to metric have reverted back to English, he said.

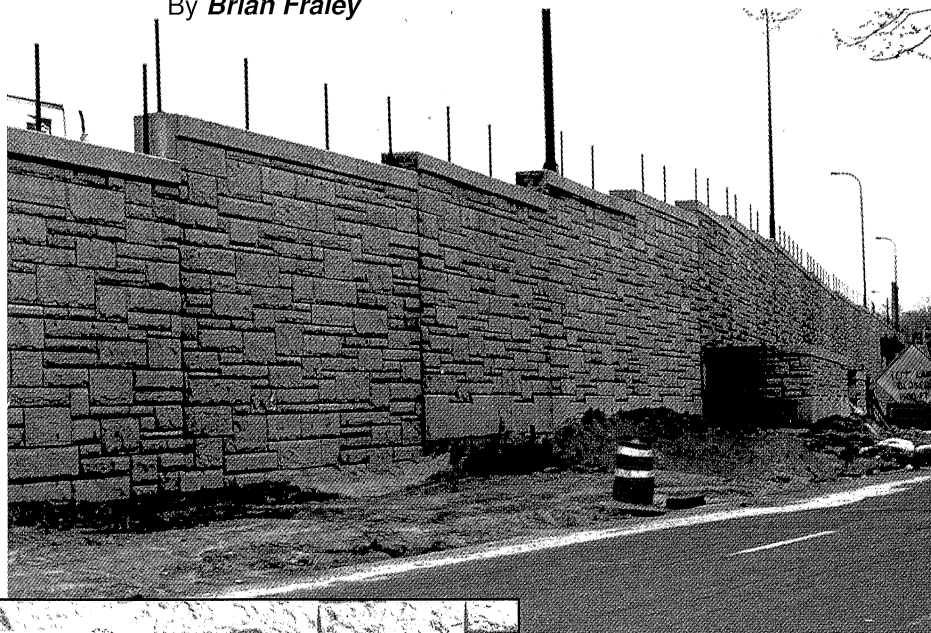
Under a \$56-million contract, DeFoe is one of several contractors that were hired to widen the six-lane Long Island Expressway (LIE) in preparation for future contracts that will revamp the expressway and incorporate a High Occupancy Vehicle (HOV) system.

Implementing the Megaform system required the clearing of a few hurdles. The system uses English measurements. The New York State Department of Transportation (NYSDOT) doesn't.

Supporting expansion

July 19, 1999, was DeFoe's start-up date. An aggressive schedule required completion by July 26, 2000.

The work site stretched about two miles across three exits in Nassau



▲ **Project Superintendent Vincent Macri (left) and Carpenter Foreman Tom Conlin headed DeFoe's field crews.**

County, N.Y. The existing mainline runs three lanes to the east and west. Bridge structures along the mainline included a steel beam bridge and two precast box beam concrete girder bridges.

One of DeFoe's primary concerns was forming the large quantity of retaining walls that would support the widened areas along the mainline. Approximately 12,000 square

▲ **The Megaform Gang Form System was used to create retaining walls and planter walls for the widening of the LIE. Ulma Form Works' engineers performed a value engineering study that enabled DeFoe to continue a non-repeat Ashlar Stone pattern in 90-foot increments.**

feet of Megaform panels were used along the stretch to form 15- to 30-foot-high retaining walls and some 8-foot-high planter walls. A landscaping contractor will come in at the end of the job to backfill between the walls.

Falco Construction Corporation of Brooklyn, N.Y., drove temporary sheet piles to hold back the terrain as the retaining walls were constructed.

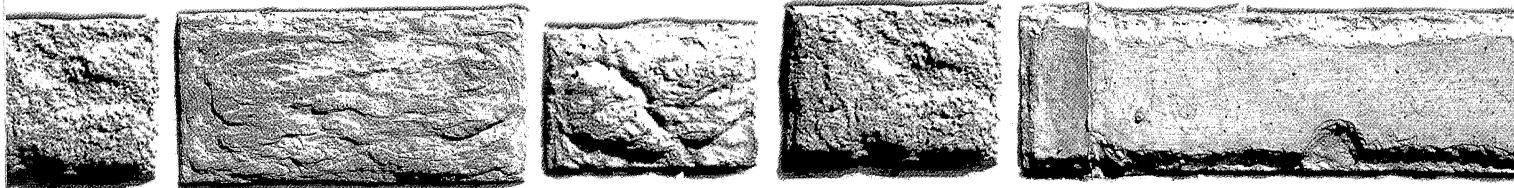
"Generally, we use wood forms, but we don't have this much linear footage of wall to do," said Carpenter Superintendent Tom Conlin, the brains behind DeFoe's formwork installation. Conlin said DeFoe nor-

mally prefers wood forms because much of its work is done in stages, and often, costly rental forms sit unused. The contractor doesn't have a large stockpile of its own patented forms, either.

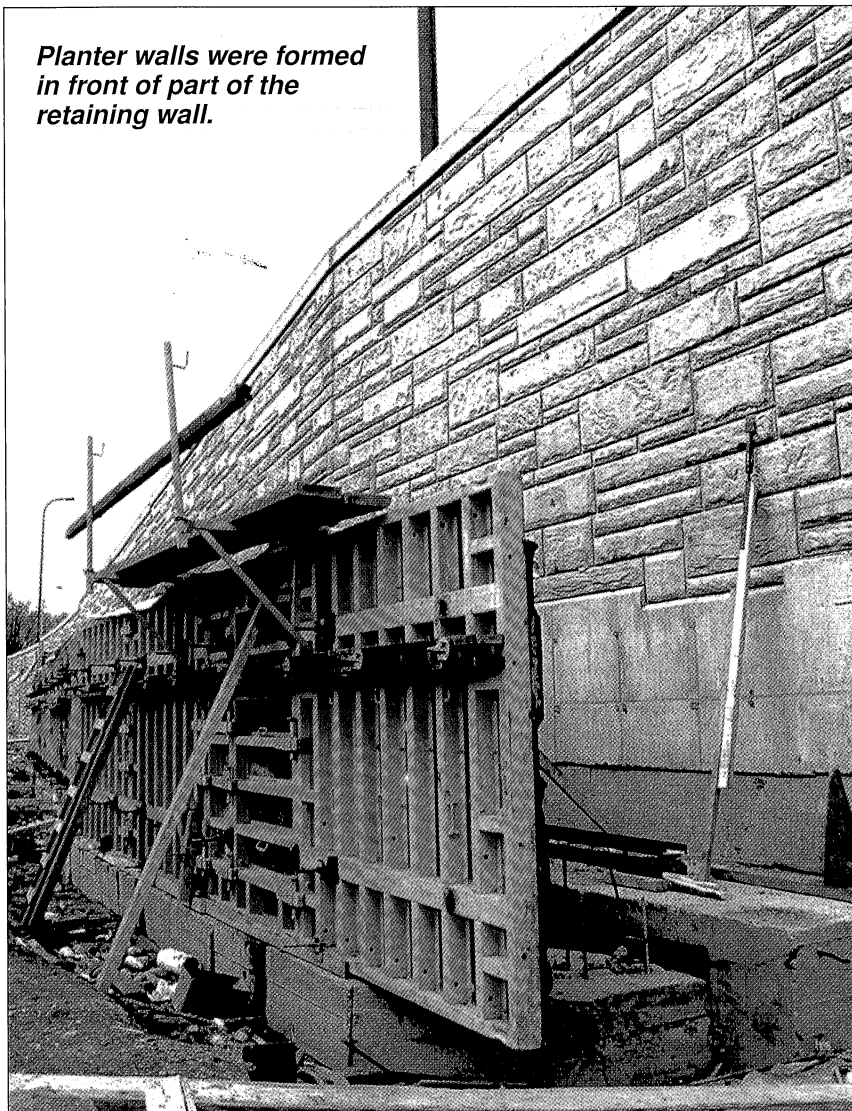
Let the games begin

The toughest part of the system, according to both Conlin and Project Superintendent Vincent Macri, was maintaining the consistency of the non-repeat Ashlar Stone pattern. This was especially true at the breaks near the wing walls. Uniformity was not an option. The pattern had to run in 90-foot increments.

Working from a basket, workers chipped away at a wing wall.



Planter walls were formed in front of part of the retaining wall.

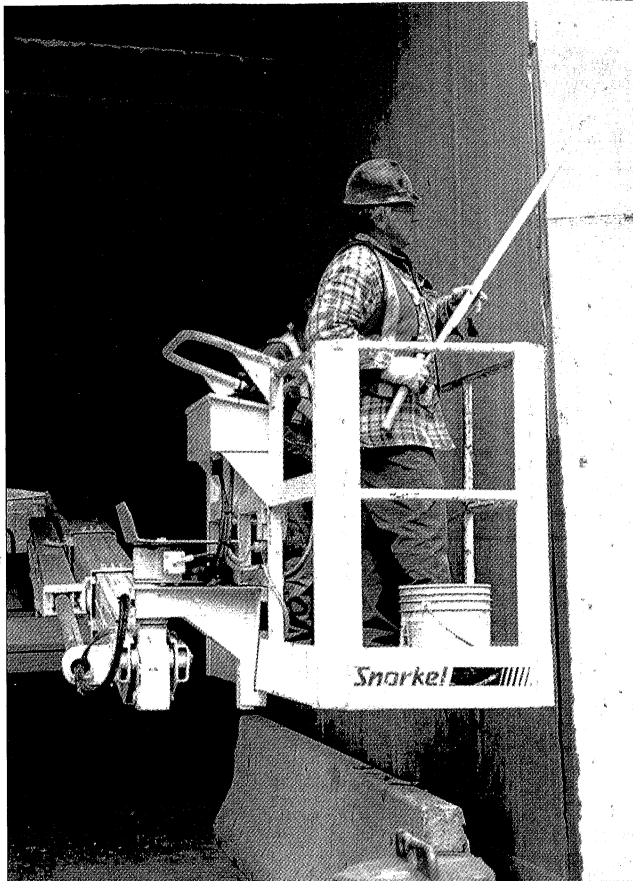


The problem stemmed from a conflict between designed construction joints and the Ashlar Stone pattern, which was formed by Ulma's 15-foot-long, six-pattern Fitzgerald urethane stone form liners. The original wall joints were located at random, oddball lengths.

In response, Ulma engineers conducted an in-depth value engineering study that was submitted to and approved by the governing NYSDOT regional office. The study rearranged wall joints and heights and matched these requirements to the correct forming system. As a result, the forming system was made somewhat typical and repetitious where gang forms could be used in several areas with a pittance of extra work.

"Jorge Calvo did help us with the redesign of the job," Macri said, stressing that close coordination took place between Ulma and DeFoe's Project Manager Michael Casella. "He (Jorge) basically redesigned the job for 30-foot joints." The 90-foot sections are comprised of 30-foot-long-by-30-foot-high panels.

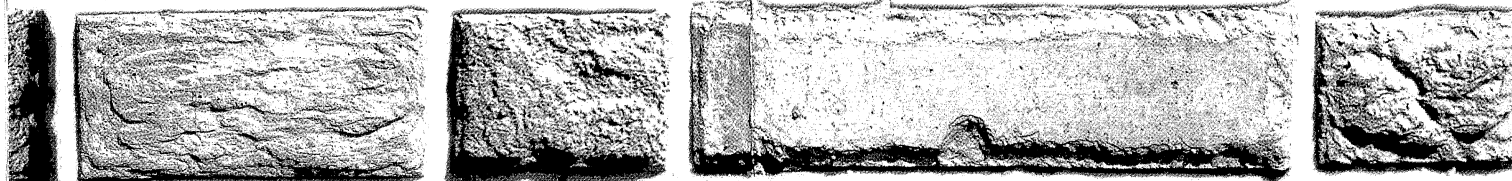
A 12-inch coping slab on top of the walls further complicated matters, requiring the top to serve as a constant. It was also important that segments could be added and stripped from the bottom of the forms to adjust to varying heights. This is another area where the Megaform system's numerous panel



▲ Workers put the finishing touches on an abutment wall.



▲ DeFoe used Grove 35-ton cranes to handle formwork and pour concrete for retaining walls.



sizes and quick, easy assembly and breakdown was very helpful. Most of the forms were 4 feet high. Ulma designed the system to have coinciding liner joints and form joints, facilitating form rework.

The metric aspect required some adaptation, but posed no threat. "It's like somebody giving you instructions in a foreign language and you just interpret it in your own language," Conlin said of the metric conversions required.

According to Conlin, another challenge was getting down the right method of handling the panels. "As far as the mechanics of it, it was relatively simple," he said. "For access, you've got to have a small machine, but it's got to be able to handle the weight of the form with the urethane (liner) on it." DeFoe used 35-ton Grove cranes.

► A Cat 446B backhoe excavates around a duct bank.

The Grove crane fleet also filled the forms with an HP mix with fly ash additive supplied by Elm Transit Mix, Westbury, N.Y. Pumping was necessary on a couple of occasions in areas with limited access.

Working with the HP concrete was yet another area where DeFoe had to "dot the Is and cross the Ts."

"If you had a little piece of that wall open up an inch, you could lose 40 yards of concrete," Conlin said, recalling a few cases where the concrete didn't set right on the bottom. "You've got to have a sturdy form or you're gonna find yourself in trouble with the HP. These (Megaform) forms were rugged enough."



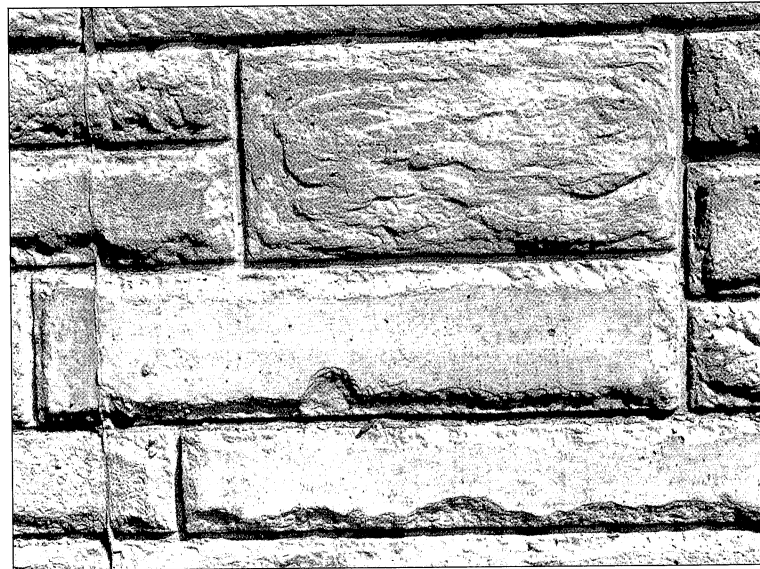


Ready for widening

Once the widening work is complete the area is brought up to grade with the mainline. DeFoe's crews are using a concrete finishing machine to place a 9-inch concrete base. Graceway Development Corporation, Bronx, N.Y., is then called in to lay down an asphalt overlay. Asphalt was placed up to 2 feet in depth at Community Drive.

◀ A crew pours a noise wall foundation with concrete supplied by Elm Transit Mix.

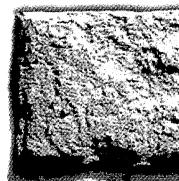
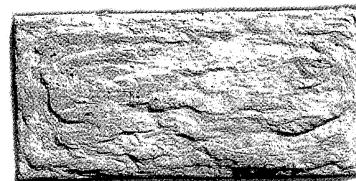
▼ Close-up of the non-repeat Ashlar Stone pattern on retaining walls.



will encompass the installation of a new median barrier.

Recalling all the challenges as the project enters the final stretch, DeFoe has no regrets about trying the Megaform system.

"It was a combination of the price of the product and the fact that Jorge spent a lot of time and put a lot of effort into making this product workable for us," Macri said. "That's the reason we went with them (Ulma)." ♦



► The early stages of forming a 24-foot-high architectural concrete retaining wall with Megaform. Also seen is the liner on the opposing form surface.

Close to 50,000 cubic yards of earthwork is required, most of which will be reused on site. Several utility lines were replaced on the service roads and in the widened areas.

The contract also entails the erection of about 5,800 linear feet of 28- to 30-foot-high noise wall to squelch traffic noise in residential areas. The 4-inch-thick precast panels are textured with a block pattern on the expressway fascia and a brick pattern on the opposing side.

DeFoe's crews have been working three stages along the length of the LIE. Work on the north side was completed in the first stage. Crews are now working on the south side. The final stage

