Installing modular block retaining wall  

Finished replacement structure

Hamilton County forces replaced a failing laid-up stone wall, located near Sabael (south of Indian Lake), at the intersection of NYS 30 and CR6, using precast modular block. The structure was designed, and photos submitted, by Andy Bell, A. S. Bell Engineering, Slingerlands, NY.

Precast concrete was utilized at Buffalo State College for a steam tunnel relocation, which involved 1200 LF of 5’-0” wide by 2’-6” high sections (inside dimensions). It also required four precast junction vaults, with sizes up to 8’ x 13’ x 10’. Ingles Development was the contractor, and Kistner Concrete Products supplied the precast segments.
SPECIFICATIONS – Prescriptive or Performance?

Prescriptive Specifications call for a defined set of conditions without reference to any particular function. For example, to specify three inch walls in a septic tank. Clearly, this does not get anything in particular accomplished, except one is able to measure the thickness of the wall and confirm whether or not it is three inches thick. A performance specification will call for a measurable ability. For example, “septic tanks shall be made to withstand a constant load of 500 pounds per square foot (PSF).” This performance spec does not mention strength of concrete, age of concrete, wall thickness, reinforcement, materials, or methods of manufacture.

BUT, it does call for a tank suitable for burial in several feet of soil. Prescriptions are easier. They do not change. No thought is required. Our industry is buried under a mountain of prescriptions. ASTM C-478 is the standard specification for manholes. If a manhole is built to ASTM C-478 it will be reinforced with steel. There is no other means allowed. If an inventor discovers a new, better, non-corroding material, it cannot be used. Today, structural fibers are a known choice to replace steel. In the near future, carbon fiber technology, which works so well for golf clubs and fishing poles, may give us a non-corroding, lightweight reinforcement superior to steel. BUT, neither may be used in manholes built to ASTM C-478.

Prescriptive specifications lock us in time. ASTM C-478 is a snapshot of the best technology of the day it was written. There is no allowance for modernization. Performance specifications invite new technologies. If an inventor can prove by testing, that his new technology works, then he can enter the marketplace where benefits and costs will determine success or failure.

The rectangular inlet box (shown) was made on 11/12/07 and it was reinforced with structural fibers. By applying 13.5 inches of vacuum, the sides were successfully loaded to 972 psf. There is no steel in this box.

Thanks to Ed Pennypacker, JEPCO Sales, for submitting this article. Also available from Ed is a Delta Engineers report of results using 3-edge bearing tests on 48” manhole sections reinforced either with fibers or WWF. And for more in-depth design and testing information, he has a Delta Engineers report of structural evaluation and testing of standard 30” x 48” x 36” id catch basins with 6” walls and base and 2” knockout panels, reinforced with Forto Ferro synthetic fibers.

Australian “O-Bahn” Busway Rides on Precast Components

In Adelaide, Australia, busses are steered on a track by side guide wheels (see photo on page 3) giving the system all the high-speed virtues of a train, shooting past rush hour traffic at +60 mph, with half the cost. This coupled with the flexibility of a bus to pick up/drop off passengers up and down city streets then deliver them locally through the suburbs and get back on makes it more suited than a train for the urban sprawled cities found in Australia and the US. Unlike a train you can build a section of track running out of the city and where it stops the O-Bahn bus becomes a normal bus until you fund the next phase.

Planners tend to think New York City and Boston/European/Japanese high cost mass transit systems must involve trains, trams and sexy Gee-Wiz monorails. By contrast, a busway is a lot more practical, cost effective and flexible for small- to mid-sized cities. The rubber tires are quieter than steel rail and busses faster to stop in an emergency. The corridors are narrower (no cut and fill for track ballast that takes up room particularly on sloped ground) and as you’ll see only barely wider than the bus – lower and narrower bridges under roads and lighter bridges over them. The grades for a bus can be steeper than a rail line — again saving cost and making it practical to go under or over a road then back to ground level.

(continued on page 3)
In Adelaide they used a river valley, in Germany (the original O-Bahn) they used the median of a main road. Existing utility corridors, including power line easements, could be used to run busway tracks saving time, money and protests on land acquisition. If you changed the duel wheels for single but wide tires, you could even have the bus share a tram/railway track. This has been done in Germany.

There are no tracks to switch, as crossovers are manually done by the driver at the interchange, and signaling is at a minimum. The busway has the ability to be electrified but they actually elected to run them all on compressed natural gas engines (diesel convert) — less pollution and lower running cost, yet flexible.

Whether a clone of this bus way is used or an improved American version along the same principals, there is a great potential here for the precast industry to introduce a system appropriate for small- to mid-sized cities. Given that there are a lot more of these cities than metropolises, the market for this system is arguably much bigger than that of rail. A 12 km/8 mile two-way track (like the one in Adelaide) would keep a precaster with a 350 foot bed busy for a year!

My suggestion would be to look at making a track using longer prestressed units Super Double Tee with thicker stems and flange complete with the guide curb. Such a design would take the dynamic loads of a bus at +62 mph.
Australian “O-Bahn” Busway (continued)

(100 km/h) but span a greater distance between cross ties than the existing conventionally reinforced design seen here. These prestressed units would have NMBs carrying the negative moment across the joint from one unit to another providing live-load continuity rather than a series of pin-jointed spans. This would both improve the span and ride quality (less springy).

I had in mind a +40’ track section (on the ground like the video) that would be lower cost, smooth ride (not bouncy) and fit on the back of a standard tractor trailer. Standard curved sections would swing out to one side of the 12’ form and back to center to connect with any other piece (just like a kids train track). Reducing precast pieces and the number of cross ties and foundations/piles will reduce costs. If each unit could rest directly on the foundation, sharing it with the stem of the next section. This could eliminate the need for the cross ties, further reducing cost.

This fascinating article was submitted by Jim Schroder, Schroder & Associates, Greenville, SC, who is a Consultant to Associate Member NMB Splice Sleeve.

Erdman Anthony Honored

Consulting-Specifying Engineer Magazine has named Erdman Anthony, who has offices New York State, Pennsylvania, and Florida, one of the top 100 engineering firms in the country. And for its work on Eastman Kodak’s Footprint Reduction Program, which involved the demolition of more than 50 buildings, they received a Diamond Engineering Excellence award by the American Council of Engineering Companies. Congratulations.
THE PRECAST SHOW: Equipment, Experts and More

There’s only one trade show in North America that exclusively features the equipment, products and services for the precast concrete industry. It’s The Precast Show (www.ThePrecastShow.org), scheduled for February 18-20, 2010, at the Phoenix Convention Center and Sheraton Downtown Phoenix.

The Precast Show features the latest equipment, products and services from more than 200 suppliers to the industry. Products range from heavy equipment such as cranes, forklifts, mixers, batch plants and forms, to accessories such as admixtures, sealants and lifting devices, to bar coding systems and innovative new plant management software.

In addition to the trade show, there’s a lot more going on at The Precast Show, according to Ty E. Gable, president of the National Precast Concrete Association (www.precast.org), which is sponsoring the event along with the American Concrete Pipe Association (www.concrete-pipe.org).

“This is the best opportunity of the year to find a broad range of precast-specific training under one roof,” Gable said. “We have some of the leading experts in the precast concrete industry providing technical training through Precast University, along with tracks in business management, finance, safety and sustainability.” In addition, ACPA also will be offering its 2010 Pipe School at the Convention Center. It all adds up to more training for precast and pipe manufacturers in one place than anywhere else in North America.

“Construction is a cyclical industry, and we’re going to pull out of this recession,” Gable said. “The companies that take advantage of this lean time to train staff, diversify their product lines and learn about new technology will be the winners in the next few years. That’s the focus of The Precast Show. We’re doing everything we can to provide the resources precasters will need to succeed in the post-recession economy.”

One of the other key benefits of this trade show, Gable said, is the opportunity to talk with the experts. “Many of the leading experts in production, plant operation and specific lines of equipment will be on the trade show floor talking with attendees,” Gable said. “If you’re thinking about expanding your product line to gain new business, this is the place to find the equipment and expertise.”

It’s all about precast concrete and the tools and training required to run a successful business. Visit www.ThePrecastShow.org for complete information, registration details, hotel information and links to Phoenix attractions. Or, for more information, please call the Precast Show concierge at (866) 808-1028.

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