



CONSTANCE MARINA

Ohio River Flood Wall Performs During 20-Year Flood Event

LOCATION:

Hebron, Kentucky

PRODUCTS:

Mega-Tandem™ 3-in-1 Wall System

COLORS:

Margeaux Beige

INSTALLED AREA:

1,260 sq. ft.

SPECIFIER/ENGINEER:

Civil Design Professionals

INSTALLER:

Structures Hardscapes Specialists



BEFORE



AFTER

Background

Located just around the Ohio River's bend from downtown Cincinnati, Constance Marina is a 45-boat, dry dock storage facility with a vision to become a social gathering space for boating enthusiasts before, during and after enjoying a day on the water. Marina Owner, David Landwehr, wanted to create a more attractive riverside entrance to his facility that would be able to withstand the riverbank's harsh environment.

The Challenge

The first obstacle in the marina's evolution, however, was an unusable and unsightly hillside. From a landscape management

perspective, the slope was challenging to maintain — so steep, its grass could only be tamed by a hand-held weed whacker. From the water's view, the land was unkempt and unwelcoming. While a typical solution would be a segmental retaining wall, the marina had an additional consideration; adjacent to the hill is an outdoor living space with a patio and outdoor fireplace used by guests, and a segmental retaining wall install would require excavation of that land to stabilize the wall, destroying the existing patio and adding to the time and expense of the land improvement.

The Solution

The Belgard® Mega-Tandem™ 3-in-1 Wall System was recommended to save time,

money and headaches. The system requires no installation for excavation, offered the visual appeal of a natural stone appearance, and created an extra 1,890 square feet of outdoor space for the marina. The size and mechanical structure of Mega-Tandem™ allows for building walls up to 15-feet high and gravity walls up to 10 feet without reinforcing. Patent-pending positive mechanical connectors in the system allow for high gravity walls without a surcharge, so no excavation is needed. This is a major advantage for project sites where utility lines or property lines abut the project. For Constance Marina, it meant the existing outdoor living space was spared.

"It's a concept that's different than anything else out there," says Curt Derichs, PE, of

CONSTANCE MARINA

Civil Design Professionals, a national earth retention design firm, who designed the retaining wall.

In addition, the lighter weight panels pack a bigger PSI punch. Mega-Tandem™ panels are 12"x 24" and weigh 65 pounds per panel, which is a benefit according to Dave Landwehr of Structures Hardscapes Specialists, a national civil design build specialty construction firm. "The lighter units were cheaper to ship, and the weight made them easier to use on site," Landwehr said. Because of its weight, the block also can be installed by hand, eliminating the need for bigger equipment. The reinforced polypropylene connecting members of Mega-Tandem™ creates structural integrity in curved or straight retaining and freestanding walls, and the system has a running bond configuration, so no patterns are required. Meeting ASTM standards (C-1372 and C-1262), Mega-Tandem™ has an 8,500 psi compressive strength concrete and can offer in excess of up to 10,000 psi, making it suitable across the country, even in the coldest environments where it can withstand harsh freeze-thaw cycles. This benefit was a factor to consider for Constance Marina since it sits in a flood plain in the Ohio Valley and the retaining wall would be completely under water if the Ohio River were to flood. "Mega-Tandem's size is an advantage for smaller contractors, but its durability is a plus for even the largest jobs installed by national contractors like Structures," Derichs

explained. Mega-Tandem™ is available in three color blends with the classic look of natural chiseled stone. No staining is necessary. The Constance Marina used the wall block in Margeaux Beige.

We took an unattractive hillside and made it a functional, serviceable space with the unmatched look of natural chiseled stone.

*Dave Landwehr
Structures Hardscapes Specialists*

The Result

"We took an unattractive hillside and made it a functional, serviceable space with the unmatched look of natural chiseled stone," said Landwehr who purchased the property nine years ago for the location and functionality of the buildings. His renovations include a tiki bar already under development on a water barge at the marina, and he is looking at plans for a restaurant. "It's a gorgeous wall — it looks great and gives the marina a finished look from the water." Landwehr said.

While the aesthetic appeal of the wall is important, performance is even more vital as was the case in 2015. The heavy snow dropped by Winter Storm Thor was hit by a wave of warmth on March 8, 2015 and the Ohio River began to flood, cresting a foot above flood stage, approximately halfway up the Constance Marina's new gravity wall. The water began to recede, but with the addition of heavy rains over the following week, the river rose again

and eventually crested at its highest level since 1997, completely submerging the wall except for the cap. The water remained at this high level for two days before beginning to recede. Marina owner, David Landwehr, monitored the performance of the wall during the flood event and until the water completely receded to the base of the wall. Throughout, Belgard's Research and Development division conducted rigorous internal testing during the development of Mega-Tandem™, the team was proud of the product's performance during this natural event. "Anytime you get into these types of applications with a new product, there is always an unknown factor until it's tested in a real-life situation," said Al Pfannenstien, National Retaining Wall Manager for Belgard. "Mega-Tandem was designed as a flood wall, and now we have solid evidence of its strength and durability in the field."

About Belgard Commercial®

Belgard Commercial, part of Oldcastle® APG, offers a complete collection of paver and wall products for plazas, terraces, parking areas, roadways, rooftops and retaining walls. Available in a range of styles, premium Belgard Commercial products have been found in the nation's finest developments and award-winning commercial and retail properties since 1995.

Oldcastle APG is part of CRH's Building Products division. As the largest building materials company in North America, CRH provides a single-source solution for commercial construction projects with a full portfolio that also includes structural masonry, masonry veneers, dry mix products, hardscape jointing sands and sealants, stormwater management systems, concrete infrastructure, architectural glass, lawn & garden products, and composite decking.

