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Precast Modular Blocks Weathered Hurricane Harvey:  
key proof of cost-effective stormwater solution

REDI-ROCK

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Redi-Rock International, Charlevoix, MI 49720, USA

# Precast Modular Blocks Weathered Hurricane Harvey: key proof of cost-effective stormwater solution

Growing cities don't just create more traffic—they also create more stormwater. As cities continue to grow, engineers and city officials face a significant challenge: controlling stormwater to prevent flooding. Stormwater management is especially challenging in flood-prone areas where high population density and heavy rainfall can spell disaster for local homes and businesses. Innovative use of concrete in the form of Precast Modular Block (PMB) retaining walls can play a key role in flood protection. PMB retaining walls are being used throughout the world to create effective storm channels, retention ponds, and detention ponds. They maximize usable real estate because they rely on massive blocks to hold back the earth. Massive block size also allows walls to be built incredibly close to property lines because the blocks don't require reinforcement with geogrid or tiebacks. Many installers compare building PMB walls to building a giant Lego block wall; simply prepare a proper base course and stack blocks up.

Redi-Rock has become a key PMB retaining wall solution used by engineers and municipalities throughout North America. The Redi-Rock system is growing with concrete manufacturers now producing and selling Redi-Rock blocks in Spain, England, Northern Ireland, Norway, Russia, France, Australia, and New Zealand.



*Installation of the PMB on-site*

As a testament to the power of PMB retaining walls for stormwater management, the Lumpkin Road Reconstruction Project in Houston, Texas recently weathered Hurricane Harvey, a massive storm that devastated the Gulf Coast.



*Production of the Precast Modular Blocks (PMB)*



**Wilbert Vaults of Houston Provides Redi-Rock for Massive Detention Pond Expansion**

The Lumpkin Road Reconstruction Project should have been relatively routine, but the deeper Houston's Memorial City Redevelopment Authority dug, the more problems they encountered.

With design parameters stacking up on each other, meeting the tight budget and even tighter schedule proved challenging. The project's goals of improving traffic flow, providing pedestrian accessibility, and upgrading stormwater systems, collided at the Lumpkin Road and Westview Drive intersection.

The detention basin at that corner would need to be expanded to align with the city's drainage master plans. The L-shaped detention area had to be deepened to 19 feet (6 meters), and all six retaining walls had to be pushed back five feet (2 meters).

The engineering firm Lockwood, Andrews & Newnam Inc. (LAN) realized the narrow right of way made reinforcing the walls as tall as 20 feet (6 meters) an impossibility. Gravity walls would be complicated due to poor soil issues, which were compounded when test boring samples went as deep as 40 feet (12 meters) without hitting bedrock.

Working with multiple engineers, the Memorial City Redevelopment Authority chose Redi-Rock retaining walls from local manufacturer Wilbert Vaults of Houston to make the project possible. Redi-Rock retaining wall blocks are manufactured using a licensed steel forming system and polyurethane liners to give blocks a natural stone texture. It's possible to cast multiple block sizes and types within the Redi-Rock system, allowing engineers to design efficient, great looking walls. Redi-Rock manufacturers produce Redi-Rock blocks, often doing multiple pours per day to meet a project's timeline.

Gulf Coast Pavers installed 4,000 Redi-Rock gravity blocks in just four months to complete the detention pond improvements. More than 22,000 square feet (2044 square meters) of retaining wall surface increased the capacity of

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Retaining wall solution in use - the picture on the right hand side was taken after Hurricane Harvey

the detention pond by 20 acre-feet (24670 cubic meters), and the rest of the Lumpkin Road Reconstruction Project goals could come to fruition.

“The result was an optimized retaining wall solution that included fundamental elements of sustainable design while delivering cost-effective earth retention structures for a difficult site,” said wall engineer Clint Hines, PE, principal of JC Hines and Associates.

### Redi-Rock Model Performed Perfectly in Hurricane Harvey

When Hurricane Harvey hit Houston in August of 2017, the Lumpkin Road detention pond flooded and receded multiple times, performing exactly as engineered. Some areas of Houston received 40 inches (1 meter) of rain in less than 48 hours, but “there are no signs of movement or distress,” Hines said. “The drawdown at this location was pretty extreme, and the soil behind the wall was fully saturated. It performed perfectly.”

Houston’s flood control district is now considering using Redi-Rock on multiple other flood control projects. “The design model for these additional projects will be identical to the Lumpkin Road model. When we met with the flood control folks, we were able to show them that Lumpkin Road performed perfectly during Harvey. That’s pretty good proof,” Hines said.

### How can you protect your market from flooding?

Engineers, architects, and contractors across North America, Europe, and Asia, have been choosing Redi-Rock for critical retaining wall projects since 2000. The massive size of each block allows tall gravity walls to be built without reinforcement in many applications, and even taller reinforced walls are possible with Positive Connection (PC) blocks. Redi-Rock is available in multiple textures, including Ledgestone, Cobblestone, and Limestone. Manufacturing opportunities are still available in North America, Europe, Australia, New Zealand, and beyond. ■



Transport of the concrete products to the job-site

#### FURTHER INFORMATION



Redi-Rock International  
 05481 US 31 South, Charlevoix, MI 49720, USA  
 T +1 866 222 8400  
 F +1 231 237 9521  
[info@redi-rock.com](mailto:info@redi-rock.com)  
[makeredi-rock.com](http://makeredi-rock.com)