



▶ CASE STUDY: RETENTION POND

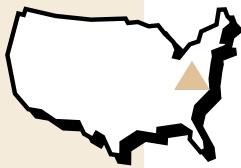
Keystone Turns Storm Pond Into Selling Feature

Developers increasingly face municipal building codes requiring them to manage storm water runoff, excessive soil erosion and hazardous material spills. Winchester Homes faced this water management issue at their Random Hills development in Fairfax, Virginia. The project architect, Rhodesides & Harwell proposed a retention pond that would manage water runoff and also serve as an aesthetic focal point.

Retention ponds typically consist of large holding areas which often consume precious development space. The Random Hills design specified a modular concrete retaining wall system surrounding the pond and joining into a cast-in-place concrete spillway. The retaining wall eliminated sloped banks thus conserving space. The architect choose the Keystone Standard Unit, with a straight split face, because of its versatility and ability to blend into both the concrete spillway and the surrounding environment. The Keystone straight split unit's near vertical setback and grey color matched the reinforced concrete spillway perfectly. The reinforced concrete spillway face was bush-hammered to blend with the split face of the Keystone unit.

The Wall Builder on the project, W.G. Construction, worked closely with Service Engineering and the Keystone Engineering Department to resolve special design considerations. One design concern was the transition from the flexible Keystone wall system to the rigid cast-in-place system. To handle this transition, special expansion joints were used between the systems.

A second design consideration was analyzing and engineering for different pressures applied to the wall from the



- ▶ **PROJECT:** Random Hills
- LOCATION:** Fairfax, Virginia
- PRODUCT:** Keystone Standard Units
- SQUARE FOOTAGE:** 8,600 s.f.
- CONTRACTOR:** W. G. construction
Centreville, Virginia
- SPECIFIER:** Service Engineering
St. Paul, Minnesota
- KEYSTONE REPRESENTATIVE:** Betco Block & Products
Gainesville, Virginia



Finished retention pond surrounded by Keystone Retaining Walls

rapid increase and sudden draw down of water during rainfalls. A concrete footing was constructed for the portion of the wall below water. Special geogrid reinforcement was designed to reinforce the soil behind the wall with a drain tile system incorporating weep holes through the wall to increase rapid drainage.

The walls, constructed with 8,600 Keystone Standard Units, are 775 feet (236m) long with heights from 6 feet to 11 feet (1.8 - 3.4m). Betco Block & Products, Inc., the Keystone manufacturer, produced a custom six inch cap unit with split face texture on two and in some cases three sides as an added finishing feature to the wall. An iron railing was installed into the cap, providing a guard rail barrier for safety around the pond.

The result was a functional, attractive, low cost water management system built with Keystone retaining wall units. Keystone turned a storm pond into a pleasing water feature, adding value and curb appeal to a new housing development.



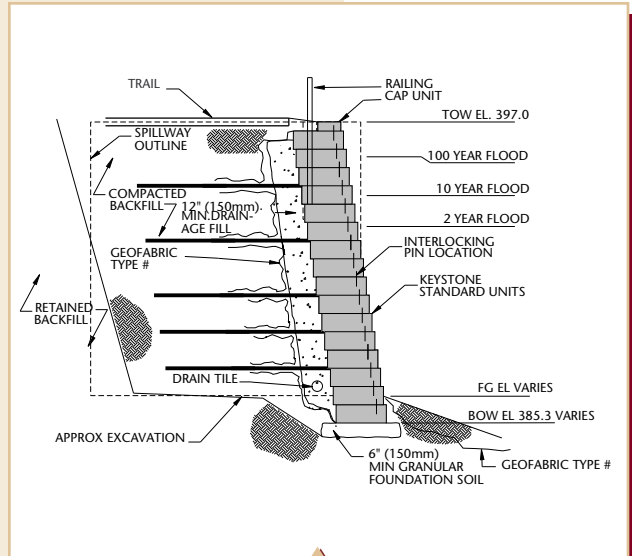
Drain tile system with PVC pipe weep holes through block



PVC pipe used as weep hole



Keystone wall built next to cast-in-place concrete spillway



Random Hills retention pond typical cross section

