

AquaBlok®

Installation Summary

Objective: Anti-Seep Collar/Berm Stability
Location: West Norriton, Pennsylvania
Setting: Retention/Detention Basin
Project Status: Completed June 2011

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Photo 1. AquaBlok placement from a bulk bag (standard shipping unit for bulk material) using a track loader/excavator – note discharge snout directing product into trench cut perpendicular to the overflow discharge pipe

Project Objective: Cut-off chronic and sustained seepage around two adjacent geothermal lines (2"-diameter PVC) associated with a loop system installed into a residential pond.

Background: Constructed in 2000, the suburban retail complex adjacent to the basin now features more than a 75% coefficient of runoff – that is, the percentage of precipitation that appears as runoff. Quite simply, more blacktop and rooftop means more surface water to manage. And with this transition in land use, a basin built in a different time (circa 1950) is now being asked to help address this increase in volume. Improvements to the basin's rudimentary overflow system were made in 1998 as the adjacent development took shape. This attempt at a long-term fix involved the replacement of the original corrugated steel overflow discharge pipe. The new structure represented a significant upgrade – approximately 85 linear feet of concrete pipe and custom anti-seep collars (with 4-foot projection) also constructed of concrete, in-place, encircled the pipe. But periodic flushes of surface water into the basin continued to put stresses in classically vulnerable locations on the earthen dam. The region excavated as part of the original renovation provided the initial vulnerability that – given time (e.g. ten years) – led to failure. Settling beneath the concrete pipe was observed almost from the onset, and the problem only worsened as the pipe shifted and ultimately buckled and broke.

Technical Challenges: In addition to periodic high-volume runoff from the adjacent impervious surfaces – which puts tremendous stress on the outfall riser and the penetration itself through the dam – this project faced a common obstacle of inadequate near-site clay borrow. Because consistent clayey soils are scarce in the immediate project area, the contractor opted to source over 30 truckloads of "washed clay fill" from a limestone quarry 35 miles from the project site.

AquaBlok Solution: 75 tons (3 truckloads) of AquaBlok 2080FW#8 (PONDSEAL™) were staged on-site in 2,400-lb (1-cubic yard) bulk bags to serve two primary functions: (1) to create the plug encircling the outfall riser structure; and (2) to create a 1-foot wide core toward the interior of the berm. As the material self-seals when hydrated, no mechanical compaction was needed. Material could simply be gravity dropped around the riser and into the receiving trench.

Equipment Used: Vans (covered semis) for material delivery; compact excavator (with 12" bucket) for trench excavation; track loader/excavator for material transloading from shipping units (2,700-lb bulk bags).

Timeline: The AquaBlok core was constructed in three, approximately six vertical foot lifts, as the broader berm was rebuilt. Each lift was completed in 3 to 4 hours. All reconstruction (site work, post demolition and pipe placement) was completed in less than a week.

Results: Using a combination of traditional methods (compacted clay) and new technology (AquaBlok), the outfall reconstruction has remained stable through multiple significant storm events and shows no signs of the types of degradation that lead to its predecessor's failure. The basin is functioning as designed.



Photo 2. Excavation of the perpendicular anti-seep trench (~12" width) that ultimately received AquaBlok from atop the existing berm (basin to the left)



Photo 3. Positioning of the AquaBlok above the anti-seep trench (basin to the right)

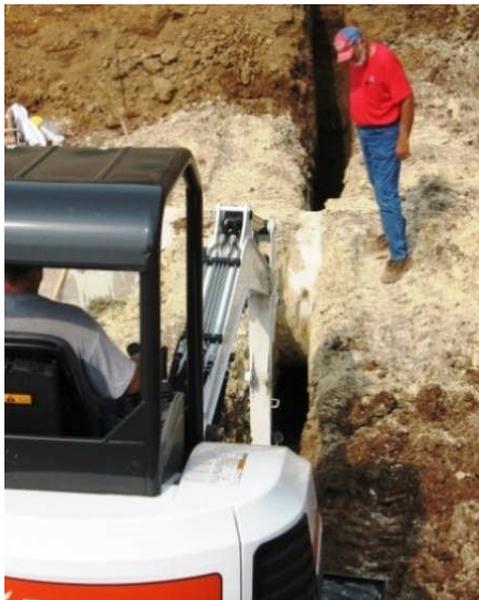


Photo 4. Overview of perpendicular trench showing intersection with 36" diameter steel reinforced, Class III concrete overflow discharge pipe



Photo 5. AquaBlok filled anti-seep trench from atop existing berm (lift one of three, ~6 vertical feet of the ~18 vertical feet total)



Photo 6. Berm reconstruction in process (basin in foreground)



Photo 7. Berm reconstruction completed (basin in foreground) - note riser structure in center of photo



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