AQUALIS

ORLANDO, FL.

POND REPAIR AND SOLVING EROSION & COMPLIANCE ISSUES

This property has four dry retention ponds that collect and treat stormwater runoff. Over time, these ponds were neglected and fell into disrepair. The local municipality inspected this property and found the stormwater system out of compliance with regulations. Deficiencies cited included: nuisance vegetation, severe erosion around structures, damaged pipes and missing/ damaged fencing. The client requested AQUALIS return the site to compliance.

PROBLEM

Dry retention ponds hold stormwater temporarily after rain events. Slowly, the stormwater infiltrates the soils before continuing downstream via an engineered control structure. Dry ponds are not designed to hold stormwater for over 72 hours. As stormwater flows across parking lots, it collects pollutants like oils, trash and sediment. This contaminated stormwater is carried through storm drains and deposited into a stormwater control measure (SCM); on this property it is deposited into one of the four dry retention ponds. The pond is designed to temporarily hold stormwater and allow the contaminants to separate and settle as the stormwater filters through the media and into the underdrain. The sediment and debris collect over time, requiring regular extensive maintenance for the pond to function as designed. As sediment accumulates, it begins to create saturated conditions and reduce the holding capacity of the basin, impeding the natural filtration process which will lead to ponding. After years and years of accumulation, the sediment laden ponds must be dredged to restore their original capacity.

On this property, the ponds had begun to suffer from lack of maintenance. Clearing out

the clogged media was necessary for the four ponds. Some ponds required full excavation, regrading the entire bottom layer while some only needed excavation around structures.

This property suffered from significant erosion and sediment displacement. Erosion is the process of sediment loosening and being moved due to fast moving water. During significant rain events, water can overwhelm stormwater control measures, bypassing outlets. The strong velocity can lead to erosion as the repeated pattern of overflow removes more and more sediment. This sediment is then deposited downstream, disrupting the natural flow of water. The excess sediment, vegetation and debris naturally flows to the dry ponds where it adds to the clogging of the asset.

Large root systems and woody vegetation in a pond is another indicator of a failing pond. Both wet and dry ponds should generally be free of trees and bushes inside the basin. Large vegetation with extensive root systems disrupts the design, structural integrity, stability and natural filtration of retention ponds and may monopolize beneficial vegetation.



AQUALIS

MILWAUKEE, WIS.

CONSTRUCTED STORMWATER WETLAND FOR NEW TESTAMENT CHURCH



SOLUTIONS

To repair the ponds, the experts at AQUALIS began by clearing and excavating the necessary areas. Overgrown vegetation and sediment were removed from all four ponds to be disposed of offsite. Underdrain repairs were then conducted, replacing sections and cleanout caps as necessary. Then each pond could be repaired back to the original design with filtering media, stabilization matting and seed. To repair outlets and junctions that experienced erosion, AQUALIS corrected any structural deficiencies, regraded and installed rip rap to protect from further soil displacement. Rip rap is intentionally placed rocks that disrupt fast moving water, slowing the velocity to allow for proper energy dissipation.

Ponds 1, 2 and 3 on this property suffered from damaged underdrains. Underdrains are a component of some ponds that aid in conveying stormwater out of the pond and further downstream at a controlled rate. Ponds can function without them, but they are additions on some properties based on site variables and design conditions. The underdrain in pond 1 had numerous sections of exposed or damaged pipe that needed to be repaired, reconnected and buried. During the excavation stage, the underdrain system was exposed to allow access for inspection and repairs. Underdrains are most often constructed from PVC pipes and often buried only 6 inches under the surface, making replacements relatively easy. After the damaged components were removed, new lengths of pipe could be secured and buried at the appropriate grade.

The underdrains in ponds 2 and 3 suffered damage to the cleanout sections, which are the vertical pieces of pipe visible above ground that allow access for cleaning and inspection. Because the cleanout sections protrude out of the ground, they are susceptible to damage from lawnmowers. It is extremely important for certified stormwater professionals to maintain stormwater control measures to avoid mishaps like this. Dry retention ponds may just look like a patch of grass, but they are specifically engineered to improve water quality and should be regularly maintained by stormwater professionals.