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Innovations

In Stormwater Clarification

Menards Project

Spring 2005 – Fall 2006

Before construction started on a new hardware store the engineer, Manhard, knew they had a problem. The soils on the 30 acre site contained high-swelling clays which would have trouble meeting the city of Antioch's stormwater discharge limit of 70 TSS. The clays became suspended in a colloidal state for long periods of time, meaning that the 5 acre retention pond on the site would not be enough to reduce the turbidity by itself. On top of the discharge limit, the city required notification whenever water was leaving the site, which would be tested for compliance.

Due to the guidelines and close surveillance, the contractor, Thelen's Sand and Gravel, wanted to make sure the site could meet the NTU requirements. The project owner, Gene Porto with GLP Development, contacted Dan Salsinger with ERO-TEX for help to design a stormwater treatment system that would be able to meet the NTU readings needed.



A continuous flow-through treatment ditch was designed for use with site-specific polymers to address the turbidity problems on the site. The stormwater was kept in the retention pond while the treatment ditch and baffle system was constructed and then pumped into the treatment system. The ditch was lined with a geotextile fabric then rip-rap and filter stone were installed into the swale.

Above: The treatment ditch was created using rip-rap, filter stone and the Floc Logs.

Left: The treated water emptied into a baffle grid system, where the flocculated particulate was collected.



The turbid water mixed with the Floc Logs as it traveled down the ditch line, allowing the polymer to dissolve and react with the suspended sediment, binding it together and causing it to drop out of suspension.

The treated water was then discharged into a baffle grid system. Panels of jute and CTRM mats charged with the 712 Silt Stop powder provided surface area for the flocculated particulate to adhere to and helped remove the fines from the treated water. The water spread out into the pit, slowing its velocity to help allow the treated sediment to settle out.



Above: The treated water exiting the treatment system was consistently around 20 NTU, well within the discharge limits.

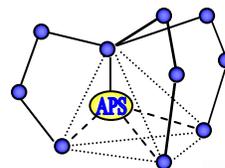
Above Right: The water being pumped out of the retention pond and into the treatment ditch was still very turbid, even after extended settling times. The suspended sediment was flocculated by reaction with the Floc Logs and then trapped by the filter stone in between the ditch checks.

After passing through the line of baffle panels, the clarified water was discharged into a sampling pit where it could be tested to ensure it was now within compliance before discharging off site.

The system was set up and run for 7 months until project completion, during which time it discharged water at around 20 NTU consistently.

The installation and use of the treatment system protected the surrounding waterbodies from discharge of increased sediment loads and protected endangered species nearby.

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