Applied Polymer Systems, Inc.

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Innovations

In Erosion Control

West Village Baffle Grid System

At the intersection of Atlanta Road and I-285, a former industrial and residential area is being redeveloped into a unique, pedestrian friendly mixed-use land plan with strategically located green space areas linking to the historic Silver Comet Trail. West Village is truly the place to live, work and play. West Village delivers that small-town community feeling right at the crossroads of Vinings at I-285 and Atlanta road, fifteen minutes from downtown Atlanta. It is one of the largest live-work-play developments in metro- Atlanta. A Starbucks coffee shop and retail shops are located at the main entrance when you drive into the complex.

Woody Snell, a Cobb County Soil and Water Supervisor for the State of Georgia, contacted Applied Polymer Systems to help oversee a baffle grid system to enhance their approved erosion control design assuring no sediment leaves the site and storm water leaving the site meets state regulations. Woody Snell had previously used the baffle grid at an extremely environmentally sensitive development site draining into the Chattahoochee River, a designated trout stream, with excellent results.

Above: The plunge pool collects the heaviest sediment discharged from underground storm drains.

Above: West Village is a pedestrian friendly mixed used land plan to live, work and play.

The baffle grid is a particle collection system made of jute and coconut covered baffles used in conjunction with Applied Polymers Systems' Floc Logs. The Floc Logs are placed in the storm drains treating the water before it reaches the baffle grid system. The Floc Logs treat the turbid storm water agglomerating the fine sediment and clays into larger, heavier particles. These larger particles become trapped on the baffle panels and settle out in the grid system producing clean, clear water meeting state regulatory discharge standards. The baffle grid mimics a Lamella Clarifier that is used in water treatment plants worldwide.

The baffle grid at West Village, installed below the headwall at the downside of the project, protects an adjacent stream and wetland. The underground storm water drain system drains the site's discharge storm water through a forty-eight inch pipe at the headwall directly into a plunge pool. The plunge pool is 18 feet in diameter and 10 feet deep and is left open for maintenance. The plunge pool collects the heaviest sediment discharged from the underground storm drains and decreases the velocity of the water before it enters the next stage which is a channel strategically set up to further decrease the velocity of the water before it enters the baffle grid.

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Above: The channel is a conveyance system that aids in the reaction of the Floc Log and APS Silt Stop treated storm water.

Above: The baffle grid is a system where phosphorus, inanimate particulates, pollution and sediments are flocculated out improving water quality and clarity.

For more information on this or other Polymer Enhanced BMPs contact:

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The channel is a conveyance system that aids in the reaction of the Floc Log treated storm water. The channel is constructed using two rows of Jersey Barriers forming a 16 by 100 foot channel. Geosynthetic textile covers the channel from one side of the Jersey barriers to the other, overlapping the plastic with the overlap going with the direction of the flow, preventing the water flow from picking up more sediment. Rip-rap is placed on top the plastic sprinkled with APS Silt Stop powder. This is then covered with jute and again sprinkled with APS Silt Stop powder. The purpose of the rip rap covered with jute and polymer is fourfold: velocity of the water is decreased, energy is dissipated, the polymer enhances flocculation of sediment and large flocculated particles attach to the jute.

From the channel, water flows into the baffle grid. The ground was prepared and leveled by an excavator and the final leveling done by using a story pole and shovels. Next, the perimeter panels, made of 2x4s and 5/8 inch plywood, were assembled to make a perimeter of 96 feet by 25 feet and 24 inches high. The perimeter corners were shot in using a builder's level. The perimeter panels are only on three sides leaving the backside open for water to discharge into a soft armored, polymer enhanced treatment ditch. The panels, covered with plastic overlapping a foot, are designed to keep the water inside the baffle grid system.

Once the entire perimeter was lined with plastic, the baffle panels were installed starting at the discharge end. Each baffle measures 8 feet long and 22 inches high. The baffle is constructed of a 2x4 frame and covered with jute and C-125 with the C-125 having a 6-foot lap that laps under the next panel. Each 8-foot baffle was lined end-to-end and nailed together and secured with metal silt fence stakes. This process begins with the last baffle having the 6-foot C-125 lap extending under the next row of panels 2 feet apart and continued until all rows were installed completing the baffle grid system. Floc Logs are place throughout the baffle grid.

As the water flows in and through the mixing chamber of panels, water comes in contact with the Floc Logs. The polymers react with the sediment flocculating the sediment into larger conglomerates that settle out and attach to the jute and coconut panel surface. As more and more particles build up on the existing particles on the surface of the baffle grids, they become heavier and heavier and fall off to the bottom of the grid system. This allows for a continuous passive storm water treatment system that requires very little maintenance.

The baffle grid system enhances the approved erosion control design assuring no sediment leaves the site and storm water reporting to offsite streams and wetlands meets state regulations. Not only is West Village one of the largest live-work-play developments in metro-Atlanta, the development has near drinking water quality storm water leaving the site reporting to the adjacent wetlands and streams.