Product Introduction

A.S.P. ENTERPRISES, INC.
Your GeoSource Distributor

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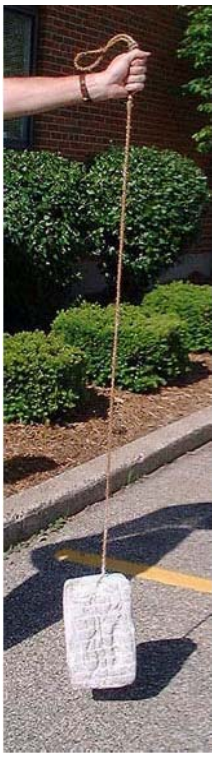
Storm Drain System Clarification



The use of flocculants to clarify waste water and polish potable water is well established. Four distinct steps **MUST** be taken to achieve the desired performance.

Step 1: Polymer Selection

Site specific soil lithology and water chemistries require a match in polymer chemistry to render the desired water quality and polymer use efficiency [low-cost]. Simple bench testing provides the needed match determination. Free testing is available via **Applied Polymer Systems, Inc.** [**APS**] or its distribution network.

Step 2: Polymer Introduction

The introduction of **APS** *Floc Logs*., a semi-hydrated form of polyacrylamides (PAMs), allows simple, passive polymer introduction into a storm drain system. Many types of *Floc Logs* are available to meet site specific soil and water chemical needs. Approximately shoebox in size with a hemp rope extension, they are routinely placed on the bottom of designated manhole or catch basin exit pipes. Storm water passing the *Floc Logs* dissolves the polymer. The number of *Floc Logs* used is dependent on a designated flow rate. Typically, an application rate of one *Floc Log* per 60 -70 gpm discharge is sufficient [~7 *Floc Logs* per cfs]. The Project Engineer should determine the locations for *Floc Log* placement, based upon pipe system layout, contributory flow rates and effectiveness of the polymer/soil match.

Step 3: Floc Formation

Floc forms as the suspended solids attach to the charge sites on the polymer chains. To achieve attachment, the storm water and polymer must 'mix' as they travel down the pipes. Typically, mechanical or active mixing is not needed. The time required to achieve proper floc formation and, therefore, ensuing water clarity, is dependent on the effectiveness of the chemical match between the soil and selected polymer. The bench testing mentioned previously provides a good approximation of the required mix time.

Step 4: Settling Time

Once the floc has formed, it must have an opportunity to settle out. A quiescent water body, such as a sediment basin fore bay, typically provides a sufficiently low energy environment for floc settlement.

Floc Log. Placement Procedures

Floc Logs are typically placed within the exit pipes of manholes or catch basins. The provided hemp rope or a poly rope extension, secured to the access ladder, prevents down-gradient movement during flows. When more than one *Floc Log* is used at a location, securing ropes should be cut carefully to length to allow the *Floc Logs* to lay along the pipe length, without bunching, i.e.,

each *Floc Log* should have a different rope length with a length differential greater than the length of a *Floc Log*. Do not tie one Floc Log to another. For pipes 24" or greater in diameter, two *Floc Logs* may be secured side-by-side by the same poly rope extension. At locations with more than one longitudinal placement, secure the most down-gradient *Floc Log* or pair first, then proceed upgradient as needed.

Other Considerations

Water leaving the fore bay or sediment basin should be decanted from the surface, allowing the cleanest water to move to sensitive, down-gradient water bodies. Once polymer is introduced into the system, all downstream soil surfaces that can contribute eroded soils or colloids to the drain system or basin[s] must be protected from erosive stresses. Upon initial use, typically during or immediately after the first runoff-generating rainfall, an inspection of the exiting storm water quality is needed. The initial flush may be somewhat turbid due to soil resident in the pipes following installation. With continued flow, the exiting water may continue to appear turbid as a result of the floc flowing within the storm water. Once the flow velocity is reduced in the fore bay or sediment basin, the floc settles, producing a 'clean' water column. 'Tweaking' of the system should be anticipated to optimize performance. Floc deposition within the pipes is possible during the final stages of flow from a storm event. However, the floc will have a low bulk unit weight and will readily re-suspend during the first flush of the next runoff event. Therefore, pipe clogging or blockage is not a concern when using **APS** PAM's for storm water clarification. Floc re-suspension within the fore bay or sediment basin is possible only with very high energy regimes. With properly sized and maintained bays or basins, any re-suspended floc will 'migrate' only a short distance down-gradient prior to settling back out of the water column. Clean bay or basin decant will continue. Floc settled into a fore bay or basin bottom is not likely to degrade into polymer residue and very fine soil particles, enabling a re-suspension of colloids. Polymer breakdown [floc degradation] occurs by bacteriological decay or sunlight degradation, neither of which is likely during construction, even if the eroded and transported soils have a high organic content. Once the floc is removed from the bay or basin bottom, which typically subjects the polymer to both sunlight and bacteria, polymer breakdown will occur rapidly [months], assuring that polymer bioaccumulation does not occur.

Maintenance Schedule

Once properly functioning, maintenance requirements become minimal. As mentioned, flowing water dissolves the polymer. Sufficient *Floc Log* numbers must be maintained at the appropriate locations to provide adequate floc develop, as can be determined by: 1. Reviewing the *Floc Log* size and number at the various placement points, or 2. Reviewing the storm water quality at the outfall into the fore bay or sediment basin. Such inspection should occur during or after each rain event or every 2 weeks, whichever is the shorter duration. Cleanout of collected sediments and floc from the fore bay or sediment basin should be conducted, as needed, to ensure that adequate storm water detention or retention is maintained. *Floc Log* longevity is dependent on total flow of water through the storm drain system. For typical, temperate zone rainfall durations, intensities and frequencies, *Floc Logs* should last 4-6 months. With excessive sand movement within the pipes, shortened longevity should be anticipated.

Additional Support

Please contact you're A. S. P. Enterprises Sales Representative for further information regarding the use of **APS** *Floc Logs* and other polyacrylamides.

*Information in this case study provided by Price & Company, Inc.

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