

DERRY-LONDONDERRY EXIT 4A**13065****FEBRUARY 13, 2020****SPECIAL PROVISION****AMENDMENT TO SECTION 645 – EROSION CONTROL****Item 645.85 – Flocculant Treatment System (FTS)
Item 645.852 – Flocculant Treatment System Operation**

This special provision provides for the use of a Flocculant Treatment System (FTS), to facilitate construction stormwater management operations. This item provides a mechanism to dose and mix construction site water with Anionic Polyacrylamide (PAM), and to convey it to a sediment basin for sediment removal.

Description

1.1 It is anticipated that a FTS will be an integral component of the Stormwater Pollution and Prevention Plan (SWPPP) due to the amount of open area required to meet completion dates set forth for this project. This work shall consist of the design, permitting, materials, furnishing, installing, maintaining, operating, flocculant dosing, relocating and removal of one or more Flocculant Treatment Systems.

1.2 The proposed Flocculant Treatment System (FTS) design shall be in accordance with the requirements of Env. Wq. 1506.13. The FTS must be approved and implemented prior to earth disturbance totaling more than 5 acres. The Department will review and approve the design and proposed equipment, to ensure the proposed system meets the functional requirements listed below.

Materials

2.1 A pump capable of conveying 1000 gpm at 40 feet of head, with a non-resettable flow meter, and enough suction and discharge hose to convey turbidity laden stormwater from the point of origin into the flocculants dosing equipment.

2.2 For PAM dosing with floc logs, the Design-Build Team shall install at least 40 linear feet of 18” SDR 35 pipe, with cribbing and elbows as needed to create a large water slide (A.K.A launder) with a slope of at least 8%, and a minimum 14 openings cut into the topside to accept the placement of the floc logs into the launder. This water slide or launder will serve as a flocculant dosing mechanism and be configured to drain by gravity into the mixing tank or basin.

2.2.1 For PAM dosing with powders, the Design-Build Team shall install a mechanism capable of variable dosing of powdered flocculants into the mixing tank, at rates between 2 and 20 pounds per hour.

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2.3 An 18,000-gallon mixing tank or basin, with workplace lighting for nighttime operation, stairs with handrails to access the top of the tank, and electrical power as needed to provide low velocity agitation of treated stormwater, for a minimum duration of 15 minutes, prior to discharging by gravity into the settling basin. The tank shall be equipped with both high and low discharge ports, and manways for access to remove sludge.

2.4 Settling of flocculated soil particles shall take place in an 18K Gallon (430 BBL) open-top weir tank. Tank shall be equipped with be internal baffles, or weirs (over and under), to accelerate settling of unwanted solids and fine sediments, multiple fill/drain ports with valves, including floor-level valves for low point drain out drain out and cleaning.

2.5 The Clarifying Tank shall be an 18K Gallon (430 BBL) open-top frac tank equipped with , multiple fill/drain ports with valves, including floor-level valves for low point drain out drain out and cleaning.

2.5.1 The Clarifying Tank shall also be equipped with 20 full-width and full height, heavy-duty bristle coir (coconut fiber) open weave erosion control blankets (Particle Curtains) suspended within the flow path, to provide maximal contact surface for the adhesion of smaller soil particles and floating or colloidal solids, that will not settle out by gravity.

Construction Requirements

3.1 The proposed FTS shall consist of commercially available materials that may be modified as necessary to perform the required functions listed in this Special Provision. The Engineer will review and approve proposed equipment that meets the functional requirements for this item as detailed below.

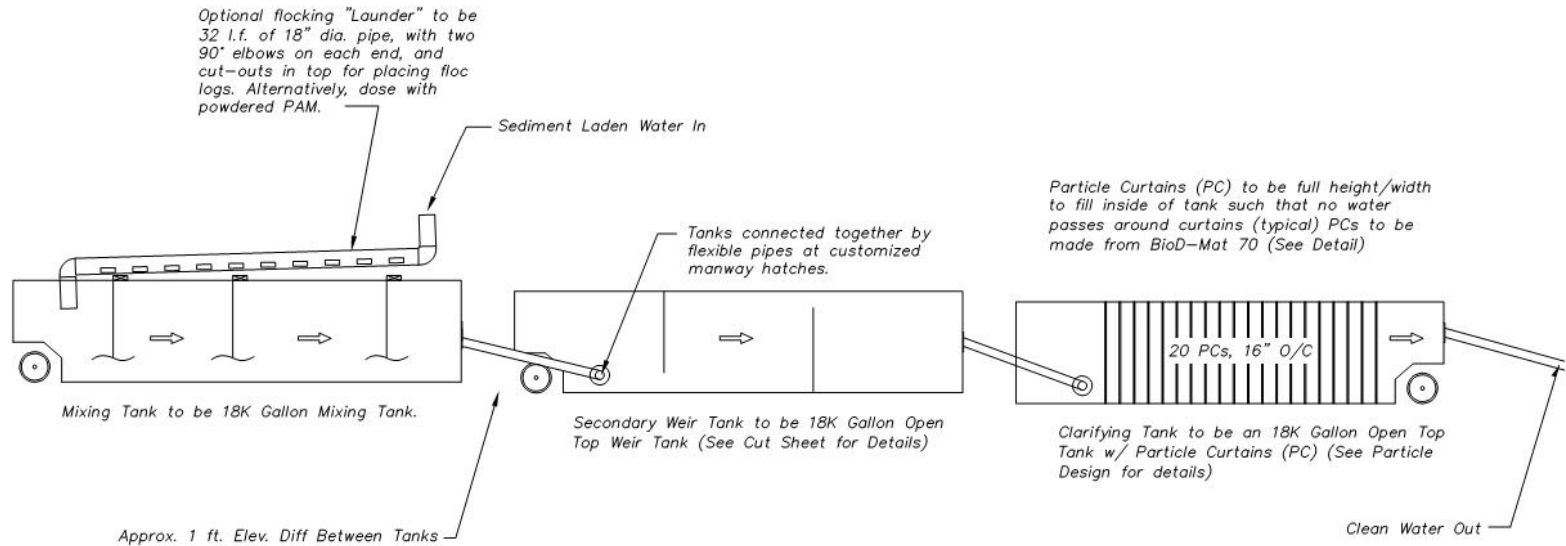
- Convey and dose one thousand gallons a minute (1,000 gpm) of sediment laden construction site water with a site-specific Anionic Polyacrylamide (PAM) “floc logs” or powder at variable and measurable concentrations up to 50 parts per million;
- Provide for low velocity mixing and agitation of stormwater treated with PAM for a minimum duration of 15 minutes, to enable PAM molecules enough time to completely unfold prior to soil attachment and settling; and
- Convey stormwater treated with PAM by gravitational flow to a settling tank or basin, and clarifying tank or similarly equipped discharge channel.

3.2 The Flocculant Treatment System shall be tested monthly to ensure readiness and functionality.

3.3 The Design-Build Team shall provide personnel, equipment, and consumable items (PAM) needed to operate a FTS, as needed to dose and mix construction site with PAM, to convey it to a basin for sediment removal.

NOTES:

1. The proposed tank configuration is intended to treat sediment laden stormwater with Polyacrylamide only.
2. Polymer selection to be based on site specific soil or sediment laden stormwater tests performed in accordance with manufactures specifications.
3. At a design point of 1,000 gallons per minute (GPM) 18K gallon tanks, as specified, provide the following: 18 minutes of mixing time, an 18 minute residence time in the weir tank, and a water velocity through the particle curtains of approximately 2.2 foot per minute. With minor modifications or additions, such as overland flow through vegetation or stump grindings, end of pipe discharges of less than 50 ntu's are typical, at flow rates up to 1,000 GPM.
4. The number of floc blocks placed into the launder may be initially set at a rate of 1 floc block per 70 gallons of pumped flow into Launder. The number of floc blocks should be adjusted to account for variations conditions, such as water temperature, degradation of logs and testing results.
5. When dosing with the powdered form of PAM, dry powder is added directly to the mixing tank. If continuous mechanical dosing is unavailable, periodic dosing with powder must occur at intervals that are less than the residence time of the water in the mixing tank.
6. System monitor to calculate the concentrations of flocculant in treated stormwater in the discharge by loss of product as a function of flow and turbidity reduction, on a daily basis. Concentrations of flocculant in the discharge shall not exceed 50 percent of the IC25 or NOEC value, whichever is less for the product(s) used.



BASIC 3-TANK FLOC TREATMENT SYSTEM

Not to Scale