



HYDROVEX® SFT SEDIMENT FLUSHER

CSO, SSO, Stormwater Management

WATER TECHNOLOGIES

HYDROVEX® SFT SEDIMENT FLUSHER

Application

Retention basins are widely used to temporarily store excess storm water or sewage during an overflow event. Every time the tank drains, settled sludge at the bottom of the tank must be removed so that the tank is ready for the next event. The cleaning of settled debris and sediments can be a labour intensive and costly activity.

The HYDROVEX® SFT Sediment Flusher is designed to efficiently remove settled debris from the reservoir floor by generating a powerful, high amplitude wave.

Operation

The HYDROVEX® SFT Sediment Flusher consists of a stainless steel tank with a circular cross section. The flusher is supported by permanently lubricated bearings at each extremity so that it can rotate eccentrically around its axis. At rest, the flusher is empty and remains in a horizontal position.

When filled with water, the HYDROVEX® SFT Sediment Flusher will become unstable due to a shift in the center of gravity. As a result, the flusher will tip backwards, spilling

its full volume instantaneously. This sudden and massive rush of water produces a powerful wave, which shears and scours settled debris from the tank floor. The re-suspended debris is carried to a sump at the end of the flush way. The flusher design ensures that once it has emptied its content, it will return to its original position without any mechanical assistance. Under normal loading conditions, the HYDROVEX® SFT Sediment Flusher will clean the tank bottom using one flush.



Figure 1: HYDROVEX® SFT Flushing

Design Requirements

Effective cleaning using the HYDROVEX® SFT Sediment Flusher requires careful design and construction of the retention basin. The shape of the basin should, if possible, be rectangular. The following design guideline describes a few important points to consider:

- Wide retention basins should be divided into multiple flush-ways separated by small retaining walls. Flush-ways should not exceed 9 m (30ft) in width;
- There is a direct relationship between the HYDROVEX® SFT Sediment Flusher size, flush-way length, head drop and floor slope.
- Empirical tests have demonstrated that the ideal flush-way slope should be greater than 1% and less than 5%. A slope of less than 1% will encourage pooling, while a slope greater than 5% increases the risk of slipping for maintenance personnel;
- To minimize maintenance, the HYDROVEX® SFT Sediment Flusher should be installed above the highest expected water level. However, increasing the flusher height above 6m (20 ft) does not significantly improve performance. Sealed bearings can be supplied should the bearings be submerged every time the tank fills;
- The flushers can be installed in new tanks or easily retrofitted into existing storage tanks. Three types of supports are available: sidewall, backwall, or top of wall.
- An outflow sump is required to prevent the flushing wave from bouncing back onto the basin floor. The sump capacity should be at least equal to the HYDROVEX® SFT Sediment Flusher volume;
- Filling water for the HYDROVEX® SFT Sediment Flusher can be drawn from any of the following sources: potable water, process water, storm water or clarified water from the retention basin.
- The fill time for a HYDROVEX® SFT Sediment Flusher should be approximately 15 minutes. A minimum supply pipe diameter of 50mm (2") is recommended.
- Filling of the flusher can be performed manually or by an automatic control system.



Figure 2: HYDROVEX® SFT Typical Installation

Selection

The size and therefore the capacity of the HYDROVEX® SFT Sediment Flusher will vary depending on the flushing lane dimensions. Flusher volumes range from 200 - 2,000 L/m of length (16 to 155 GAL/ft of length).

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