



Water Quality Filter Design Guidance

Following is a general design guidance for incorporating the Rymar Water Quality Filter and Marlee Float skimmer into your post construction stormwater management plan. The specific requirements of your local MS4 will vary and the design will need to be adjusted to meet local requirements.

Background

In many areas, stormwater detention and/or retention basins are the most common BMP for stormwater management. They are used to manage quantity control for the 2-yr, 10-yr, 25-yr, 50-yr and 100-yr storm events and often also used to meet water quality requirements which are typically based on managing a “first flush” storm event. The most common method to provide water quality treatment is to drain the “first flush” volume over 24 – 48 hours. This is intended to allow pollutants to settle prior to be discharged from the pond.

The Rymar Water Quality Filter (WQF), when combined with the Marlee Float Skimmer, has been tested per ASTM standards and shown to provide 90+% TSS removal. The WQF is sized such that it can treat the flow based on the maximum flow rate of each skimmer size. Use of the WQF eliminates the need to slowly discharge the first flush event, as the WQF will treat 100% of the rainfall that is discharged through the skimmer.

Design Methodology

Please note that the following is a general guidance document and will need to be adjusted as needed to meet local MS4 regulatory requirements and may not be allowable in all areas. It is assumed that the reader is familiar with design of typical stormwater management basins and is not intended to provide guidance for the entire basin design, but rather focus on the incorporation of the Marlee Float Skimmer and WQF.

Step 1 – Determine your peak flow for pre-development/existing conditions for each regulated storm event.

Step 2 – Determine your peak flow for post-development/proposed conditions for each regulated storm event.

Step 3 – Determine your initial stormwater basin location/size and develop your elevation/area table to confirm your basin volume. It is recommended to include elevations at one-foot intervals in order to accurately model the Marlee Float Skimmer discharge.

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Step 4 - Select the Marlee Float skimmer size and orifice size that most closely matches the lowest regulated storm event flow rate. In many areas this will be the 2-yr storm as typically the water quality or “first flush” storm is not regulated for peak flow, although this may vary by area.

Note for large sites this could require multiple skimmers or may not be practical. In this case, you can determine the first flush volume and select a skimmer size and orifice to manage this flow rather than using the skimmer to manage the larger storm event.

Step 5 – Input your outlet structure information into your hydrology program. Most programs have a “User-Defined Input” or something similar. If you are using HydroCAD then the Marlee Float Skimmer can be added as a “Special & User-Defined Outlet”. Use this to enter the flow rate for the selected Marlee Float Skimmer at each elevation based on the flow rate information provided on the Marlee Float Skimmer detail.

For ponds greater than 4’ in depth you can use the peak flow rate for depths greater than 4’ or extrapolate based on the last 3 data points for flow are greater depths. You can also utilize the Marlee Float Design tool for sediment basins to calculate the flow at greater depths for each skimmer and orifice configuration. If you need technical assistance on this please contact us at info@rymarwaterworks.com.

Step 6 – Input additional outlet structure information for management of larger storm events. Using trial and error or design tools, adjust outlet structure and basin size to meet the stormwater management requirements. Verify that the first flush volume is managed entirely by the skimmer discharge, to insure that the entire first flush volume is treated by the WQF.

Step 7 – Include a copy of the TRI Environmental Report with your hydrology report to the MS4/review agency. This should be sufficient to confirm the WQF and Marlee Float Skimmer are providing greater than 90% TSS removal for your site. If your project requires treatment for pollutants other than TSS, additional measures may be required and you can review the test data for the Adsorb-It Fabric used in the WQF. The Adsorb-It Fabric has been tested to show removal of a wide range of pollutants, however, it has not yet been tested in conjunction with the Marlee Float Skimmer for pollutants other than TSS.

It is important for the engineer and MS4/review agency to understand that the WQF and Marlee Float Skimmer are being used to treat stormwater through filtration rather than relying on settlement of pollutants. In doing so, the “first flush” volume can be released at a higher flow rate, which will also significantly decrease the required volume of the basin.

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