

## Pretreatment BMPs

### General

Pretreatment BMPs remove coarse sediment and debris (e.g., trash, leaves, floatables) upstream of other structural stormwater BMPs, while consolidating maintenance to a specific location. Properly designed Pretreatment BMPs help preserve the pollutant removal efficiency, extend the service life, and reduce maintenance costs of the main stormwater BMP.

Pretreatment BMPs can be designed as an integral component of another BMP, such as a sediment forebay within another practice, or as a separate structure preceding the main stormwater BMP, such as an upstream proprietary device. Pretreatment BMPs can also be configured as on-line or off-line. On-line systems are designed to provide pretreatment for the entire design volume or flow rate and safely convey larger flows. Off-line systems are typically designed to receive a specified volume or flow rate, such as the design Water Quality Volume (WQV) or Water Quality Flow (WQF), and bypass larger flows. A flow diversion structure (flow splitter) is used to divert the design volume or flow rate to the off-line stormwater BMP. The [Inlet and Outlet Controls](#) section addresses the design of flow diversion structures.

Pretreatment BMPs are only suitable as pretreatment for other stormwater BMPs and cannot be used alone to meet the retention or treatment performance criteria, with the exception of proprietary devices. When designed to achieve the minimum pollutant load reductions described in [Chapter 4 - Stormwater Management Standards and Performance Criteria](#), proprietary devices can be used for stormwater treatment.

### Access Considerations

The performance of pretreatment practices is dependent on regular maintenance. Pretreatment practices should be designed for easy maintenance. Maintenance access must be carefully considered and incorporated into the design. Refer to the general maintenance considerations provided in [Chapter 7 - Overview of Structural Stormwater Best Management Practices](#), which also apply to Pretreatment BMPs.

### Selection

Pretreatment BMPs should be selected based on the following factors:

- The downstream stormwater BMP
- Site-specific constraints (e.g., available space, topography, accessibility)
- Flow type (e.g., sheet flow or concentrated flow)

#### Pretreatment BMPs Included in this Section

- ❖ Sediment Forebay
- ❖ Pretreatment Vegetated Filter Strip
- ❖ Pretreatment Swale
- ❖ Flow-through Devices
  - Deep Sump Hooded Catch Basin
  - Oil Grit Separator
  - Proprietary Pretreatment Device

- Required pretreatment capacity.

[Table 13- 2](#) and [Table 13- 3](#) provide a general summary of the applicability of different types of Pretreatments BMPs and can assist in selecting an appropriate pretreatment practice. Multiple pretreatment BMPs may be used, as necessary, to enhance pretreatment effectiveness.

**Table 13- 2 Pretreatment BMP Selection Factors**

Pretreatment BMP	Pollutant Removal Processes	Inlet Flow Type	Sizing Criteria (Capacity)	Maintenance Frequency	Maintenance Effort	Required Space	Capital Cost
Sediment Forebay	Settling	Concentrated	10% to 25% of the WQV (Small to large)	Moderate	Moderate	Moderate to High	Low to Moderate
Pretreatment Vegetated Filter Strip	Filtration, Some Infiltration, Vegetative Uptake	Diffuse	Length / Drainage Area Dependent (small)	Low	Low to Moderate	High	Low
Pretreatment Swale	Filtration, Some Infiltration, Vegetative Uptake	Diffuse/ Concentrated	WQF & 10-minute Residence Time (Small to medium)	Low	Low to Moderate	Moderate	Low
Deep Sump Hooded Catch Basin	Settling & Floatables Removal	Concentrated	WQF (small)	Moderate to High	Moderate	Low	Low
Oil Grit Separator	Settling & Floatables	Concentrated	WQF (small)	High	Moderate	Low to Moderate	Moderate
Proprietary Pretreatment Device	Settling & Floatables Removal	Concentrated	WQF (small/medium)	High	Moderate	Low	Moderate to High

WQV = Water Quality Volume      WQF = Water Quality Flow

- Inlet flow type is either diffuse flow such as sheet flow or concentrated flow such as pipe flow or channelized flow.
- Pretreatment BMPs are sized on a volume or flow rate basis. Sediment forebays are sized as a percentage of the WQV, typically 10% to 25% of the WQV. The storage volume of the sediment forebay can be included in the overall design storage volume of the main stormwater BMP provided that the sediment forebay drains to the BMP. Most other Pretreatment BMPs are sized to treat the WQF, which is the peak flow rate associated with the WQV.
- Maintenance frequency reflects how often maintenance will typically be required for these practices, while maintenance effort reflects the anticipated time, skill of labor, and equipment necessary to complete maintenance. These vary depending on pretreatment device placement (ease of access), size, and the pollutants/soil types in the drainage area. These ratings are relative to the other pretreatment practices.
- Required space is the anticipated footprint used by the specific pretreatment practice after installation. This provides a relative comparison of the footprint required for the various pretreatment practices. If the practice is large but located below ground, it is considered to have a small footprint and is classified as low.
- Capital cost is the anticipated cost required for purchasing the practice and/or the installation costs that are required to implement the pretreatment practice.

**Table 13- 3 Suitability of Pretreatment BMPs Based on Type of Primary Stormwater BMP**

BMP Category	BMP Type	Sediment Forebay	Pretreatment Vegetated Filter Strip	Pretreatment Swale	Deep Sump Hooded Catch Basin (1)	Oil Grit Separator (2)	Proprietary Pretreatment Device (3)	
<b>Infiltration BMPs</b>	Infiltration Trench	☐	☐	☐	☐	☐	☐	
	Underground Infiltration System	☐	☐	☐	☐	☐	☐	
	Infiltration Basin	☐	☐	☐	☐	☐	☐	
	Dry Well	Pretreatment Not Required						
	Infiltrating Catch Basin (4)	☐	☐	☐	☐	☐	☐	
	Permeable Pavement	Pretreatment Not Required						
<b>Filtering BMPs</b>	Bioretention	☐	☐	☐	☐	☐	☐	
	Surface Sand Filter	☐	☐	☐	☐	☐	☐	
	Tree Filter	☐	☐	☐	☐	☐	☐	
<b>Stormwater Pond BMPs</b>	Wet Pond	☐	☐	☐	☐	☐	☐	
	Micro pool Extended Detention Pond	☐	☐	☐	☐	☐	☐	
	Wet Extended Detention Pond	☐	☐	☐	☐	☐	☐	
	Multiple Pond System	☐	☐	☐	☐	☐	☐	
<b>Stormwater Wetland BMPs</b>	Subsurface Gravel Wetland	☐	☐	☐	☐	☐	☐	
	Shallow Wetland	☐	☐	☐	☐	☐	☐	
	Extended Detention Shallow Wetland	☐	☐	☐	☐	☐	☐	
	Pond/Wetland System	☐	☐	☐	☐	☐	☐	

BMP Category	BMP Type	Sediment Forebay	Pretreatment Vegetated Filter Strip	Pretreatment Swale	Deep Sump Hooded Catch Basin (1)	Oil Grit Separator (2)	Proprietary Pretreatment Device (3)
<b>Water Quality Conveyance BMPs</b>	Dry Water Quality Swale	☐	☐	☐	☐	☐	☐
	Wet Water Quality Swale	☐	☐	☐	☐	☐	☐
<b>Stormwater Reuse BMPs</b>	Rain Barrel	Pretreatment Not Required					
	Cistern	☐	☐	☐	☐	☐	☐
<b>Proprietary BMPs</b>	Manufactured Treatment Systems (5)	Pretreatment Not Required					
<b>Other BMPs and BMP Accessories</b>	Green Roof	Pretreatment Not Required					
	Dry Extended Detention Basin	☐	☐	☐	☐	☐	☐
	Underground Detention (no infiltration)	☐	☐	☐	☐	☐	☐
Notes:							
<p>(1) Recommended for use with other Pretreatment BMPs or for space constrained sites where no other Pretreatment BMPs are feasible. Deep sump hooded catch basins can be impractical for use with surface stormwater BMPs (unless adequate grade difference exists between the drainage system and BMP) due to the depth of the catch basin outlet pipe.</p> <p>(2) Oil grit separators are useful pretreatment practices for runoff from Land Uses with Higher Potential Pollutant Loads (LUHPPLs) that are expected to have high pollutant loads of oil and grease (refer to <a href="#">Chapter 4 - Stormwater Management Standards and Performance Criteria</a> for list of LUHPPLS).</p> <p>(3) Proprietary pretreatment devices are useful pretreatment practices for runoff from LUHPPLs that are expected to have high pollutant loads of oil and grease, metals, and other targeted pollutants.</p> <p>(4) Requires pretreatment BMP separate from the infiltrating catch basin itself.</p> <p>(5) See <a href="#">Chapter 11 - Proprietary Stormwater BMPs</a> for use of proprietary stormwater BMPs as stand-alone treatment.</p>							
Legend	☐	Suitable for use with primary stormwater BMP					
	☐	Generally not suitable					