

Description	A sedimentation chamber and a filtering chamber characterize filtering structures. The media is housed in cartridge filters enclosed in concrete vaults, or in fixed beds such as sand filters. An assortment of filter media are available, including leaf compost, pleated fabric, activated charcoal, perlite, amended sand and perlite, and zeolite. The system functions by routing the stormwater through the filtering or sorbing medium, which traps particulates and/or soluble pollutants.	
Applications	<ul style="list-style-type: none"> <li>▪ These manufactured systems are used solely for water quality enhancement in urban and ultra-urban areas where surface BMPs are not feasible.</li> <li>▪ These systems may be designed as on-line systems for small drainage areas, or as off-line systems</li> <li>▪ For off-line applications, flows greater than the design flow should be bypassed.</li> </ul>	
Limitations	Drainage area – Based on manufacturer’s sizing criteria Minimum bedrock depth - N/A NRCS soil type – N/A Drainage/flood control – no	Max slope of filter – 1%  Minimum water table – N/A Freeze/thaw – fair
	<ul style="list-style-type: none"> <li>▪ Pretreatment is required for high TSS and/or hydrocarbon loadings and debris that could cause premature failures due to clogging.</li> <li>▪ Media filtrations, such as amended sand, should be considered for some metals treatment applications to remove soluble metals and soluble phosphates.</li> </ul>	
Targeted Pollutants	Sediment Phosphorus Trace metals Hydrocarbons	
Design Parameters	<b>Design Criteria for TSS Removal</b> Determine TSS loading and peak design flow <ul style="list-style-type: none"> <li>▪ Determine TSS loading capacity per cartridge based on manufacturer’s loading and flow design criteria to determine number and size of cartridges.</li> <li>▪ Evaluate for pre-treatment needs. Typically, roadways, single family dwellings, and developments with steep slopes and erodible soils need pretreatment for TSS. Developments producing sustained oil and grease loads should be evaluated for oil and grease pretreatment.</li> <li>▪ Select media based on pollutants of concern, which are typically based on land use and local agency guidelines.</li> </ul>	

### **Pretreatment and Bypassing**

- Use source control where feasible, including gross pollutant removal, sweeping, and spill containment. Maintain catch basins as needed to minimize inlet debris that could impair the operation of the filter media.
- Use sedimentation vaults/ponds/tanks, innovative and more efficient catch basins, oil/water separators for oil concentrations greater than 2.5 parts per million (ppm), or other appropriate pretreatment system to improve and maintain the operational efficiency of the filter media.
- Bypassing of flows above design flows should be included.

### **Construction Guidelines**

- A precast or cast-in-place vault is typically installed over an underdrain manifold pipe system. This is followed by installation of the cartridges. Other arrangements exist, depending on the product.
- Prior to cartridge installation, construction sites should be stabilized to prevent erosion and solids loading.

### **Maintenance**

- Follow manufacturers operation and maintenance guidelines to maintain design flows and pollutant removals.
- Calculate maintenance frequency, based on TSS loading and cartridge capacity.