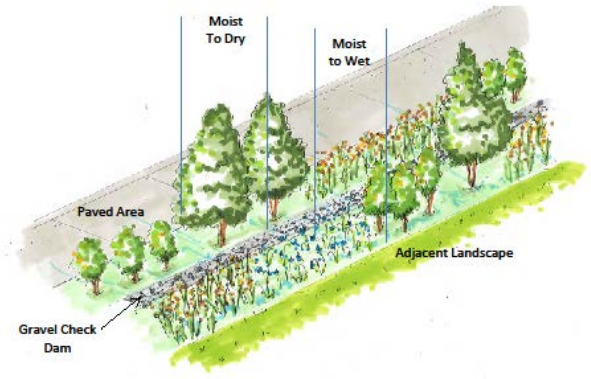
Stormwater Management Manual Section 2.3.7: Filter Strip

Facility Description

Filter Strips are gently sloped vegetated or grassed areas that stormwater runoff is directed to flow over and filter through. Stormwater enters the filter as sheet flow from an impervious surface or is converted to sheet flow using a level spreader. Pollutants are removed through filtration and sedimentation.

Vegetated Filter Strip

There are an infinite number of ways to fit this concept into site designs and designers are encouraged to use the site landscape areas for this purpose. Filter Strips can be used to treat hydraulically isolated or irregularly shaped impervious areas such as driveways, walkways and patio areas. A filter strip may be used in hydraulically isolated areas where it can be demonstrated that no natural or formal stormwater conveyance system exists. Runoff patterns must conform to Oregon Drainage Law .



Filter Strips qualify as filtration facilities and meet the stormwater management standard for water quality.

Design Requirements

Sizing: The Simplified Approach shall be used to size Filter Strips receiving less than 1000 sf of impervious area or sheet flow runoff from continuous linear impervious areas of consistent cross section on a unit basis. Examples are driveways, patios, sidewalks, bike baths and narrow access roads less than 20 feet wide. Filter Strips shall use a sizing factor of 0.2 for water quality with the Simplified Method.

Soil Suitability: Filter Strips are appropriate for all soil types. Unless existing vegetated areas are approved as a filter, stormwater facility growing medium shall be used for the top 12 inches of the facility or the soil shall be amended to support plant growth.

Setbacks: The facility must begin 5 feet from the property line; 10 feet from buildings; and 50 feet from wetlands, rivers, streams, and creeks, unless otherwise approved by the City of Eugene.

Dimensions and Slopes: Filter Strips shall slope between 0.5 and 10 percent. Terraces may be used to decrease ground slopes. Slopes shall not exceed 5% for grassed facilities. Filter strip shall have a minimum width of 5 feet measured in the direction of flow.

Level Spreaders: A grade board, perforated pipe, or trench may be required to disperse the runoff evenly across the Filter Strip. The top of the level spreader must be horizontal and at an appropriate height to provide sheet flow directly to the soil without scour. Grade boards can be made of any material that will withstand weather and solar degradation. Trenches used as level spreaders can be filled with washed crushed rock, pea gravel, or sand. Exposed pipe should be protected from weather and solar degradation .

Materials

Check Dams: Check dams shall be installed every 10' of facility measured in the direction of flow. Check dams shall be constructed of durable, non-toxic materials such as rock or brick or graded into the native soils. Check dams shall be 12 inches wide, 3 to 5 inches high, and run the length of the filter.

Vegetation

The Filter Strip must maintain 90 percent coverage by vegetation or 100 percent coverage by grass at establishment. Vegetation shall conform to the facility planting list located in **Appendix D**.

Vegetated filter strips shall be planted with minimum plant quantities from Schemes I, II or III. Minimum plant quantities are as follows:

Vegetated Filter Strip Planting Scheme	**I**	**II**	**III**
Ground Cover, 4-inch pots spaced 1' on center (per 100 square feet of the facility)	100	80	60
Small Shrubs, 1 gal. pots spaced 2' on center (per 100 square feet of the facility)		4	12

Grassy filter Strips must have 100 percent coverage by native grasses, turf grasses, native wildflower blends, native ground covers, or any combination thereof. Seed shall be applied at the rates specified by the supplier.

Plants and grass shall be established before water is allowed to enter the facility or biodegradable erosion control matting shall be installed in the flow area of the Filter Strip before allowing water to flow through the Filter Strip.

Public facilities shall be designed not to require mowing unless approved by the City of Eugene. Where mowing cannot be avoided, facilities shall be designed to require mowing no more than once annually. Turf and lawn areas are not allowed for publicly maintained facilities.

Growing Medium: Imported soils shall be a sandy loam mixed with compost or a sand/soil/compost blend. It shall be roughly one-third compost by volume, free-draining, and support plant growth. The compost shall be derived from plant material; animal waste is not allowed. The growing medium shall be minimum 12 inches deep for Filter Strips.

4.5.5 Filter Strip Operations and Maintenance (O&M)

Filter Strips are gently sloped vegetated or grassed areas that stormwater runoff is directed to flow over and filter through. Stormwater enters the filter as sheet flow from an impervious surface or is converted to sheet flow using a level spreader. Pollutants are removed through filtration and sedimentation.

All facility components and vegetation shall be inspected for proper sheet flow and stability. These inspections shall occur, at a minimum, quarterly for the first 2 years from the date of installation, 2 times per year thereafter, and within 48 hours after each major storm event.

Training and/or Written Guidance information for operating and maintaining vegetated filters shall be provided to all property owners and tenants. A copy of the O & M Plan shall be provided to all property owners and tenants.

Inspection Logs shall be kept by the facility owner demonstrating the following items have been inspected and are being maintained properly:

- **Access** to the filter strip shall be safe and efficient. Obstacles preventing maintenance personnel and/or equipment access to the components of the facility shall be removed.
- **Channelization** and causes for altered water flow shall be identified and corrected upon discovery. Stormwater should exit the vegetative filter as sheet flow, unless a collection drainpipe is used.
- **Debris and Litter** shall be removed to prevent channelization, clogging, and interference with plant growth. Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- **Erosion Damage** shall be identified and controlled when native soil is exposed or erosion channels are forming.
- **Inlets** shall be cleared when conveyance capacity is plugged to ensure unrestricted stormwater flow to the vegetated filter.
- **Level Spreaders** shall allow water to exit as sheet flow.
- **Nuisance and Prohibited Vegetation** from the Eugene Plant List (such as blackberries and English Ivy) shall be removed when discovered. Invasive vegetation contributing up to 25% of vegetation of all species shall be removed and replaced.
- **Outlet**s shall be cleared when 50% of the conveyance capacity is plugged.
- **Sedimentation** build-up near or exceeding 2" in depth shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation.
- **Vegetation** shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Dead vegetation shall be removed to maintain less

than 10% of area coverage or when vegetative filter function is impaired. Vegetation shall be replaced immediately to control erosion where soils are exposed and within 3 months to maintain cover density.

Spill Prevention Measures shall be exercised on site when handling substances that contaminate stormwater. Releases of pollutants shall be corrected as soon as identified.

Non-Chemical Pest Control measures shall be taken to prevent development of insects, mosquitoes, and rodents.