5.4.5 Filter Strips

Description: Filter strips are areas of dense vegetation located between runoff pollutant sources and other SCMs or receiving water bodies. Filter strips may be constructed of turf, meadow grasses, or other vegetation such as landscape plantings. Filter strips act to impede the velocity of stormwater runoff (thereby allowing sediment to settle out), to reduce the impacts of temperature, and to encourage infiltration. Filter strips are a water quality SCM to slow the rate of runoff, reduce peak flows, and to allow for infiltration to a lesser extent.

Figure 1: Filter strip along highway (Source: Virginia).

Site Constraints:
- Receiving area slopes must be shallow enough to not cause runoff
- Contributing area cannot be a hotspot without pretreatment

Key Design Criteria:
- Contributing drainage area
- Velocity of inflow
- Vegetation of receiving area

Maintenance:
- Watering, fertilizing, and weeding, especially in the first 2 years while plants are becoming established
- Repair erosion and vegetation as necessary
- Aerate soil as particulates accumulate to promote growth

Advantages:
- Provides flow rate reduction
- Wildlife habitat potential
- Excellent retrofit capability
- Cost effective
- Improve aesthetics

Disadvantages:
- Maintenance must be clearly defined to avoid mowing (e.g. signage)
- Salt use may adversely affect vegetation
- Vegetation and soils must be protected from damage and compaction

Design Checklist:
- ❏ Identify management goal(s)
- ❏ Review site constraints
- ❏ Review design criteria
- ❏ Protect site resources
- ❏ Size channel for site conditions
- ❏ Submit plans for review

1. Design

1.1 Suggested Applications

Filter strips are vegetated areas that treat sheet flow delivered from adjacent areas by slowing runoff velocities and allowing sediment and attached pollutants to settle and/or be filtered by vegetation. Impervious areas are disconnected and runoff is routed over a level spreader to sheet flow over adjacent vegetated areas. This slows runoff velocities, promotes infiltration, and allows sediment and attached pollutants to settle and/or be filtered by the vegetation.

Filter Strips may also be used as pretreatment for another stormwater practice such as a grass channel, bioretention, or infiltration areas. If sufficient pervious area is available at the site, larger areas of impervious cover can be treated by filter strips, using an engineered level spreader to recreate sheet flow.

Some areas on a new or redevelopment site where filter strips can be used include:

- Better suited for less densely developed locations on a site due to surface area requirements
- Used in combination with other SCMs (especially when treating runoff from highly impervious areas)
- Pretreatment or overflow discharge point for other SCMs (such as infiltration channel or bioretention area)
- To receive runoff from roof leaders or as divisions between individual lots
- Placement in underutilized areas of parks or other open space to receive runoff from compacted pervious areas
- Road and highway shoulders and medians
- Parking edges
- Riparian buffers

1.2 Site Constraints

Location and Capture Area

- Maximum contributing area < 5,000 sf (recommended)
- Contributing area flow path length for impervious areas <= 100 ft (recommended)
- Contributing area flow path length for pervious areas <= 150 ft (recommended)
- Maximum contributing drainage area slope = 6%

Filter strips are best suited to treat runoff from small segments of impervious cover (usually less than 5,000 sf) adjacent to road shoulders, small parking lots, and rooftops. Human activity, slopes, and soil type influence the location of filter strips. Select a location to prevent vegetation damage and soil compaction from pedestrian traffic or unintended vehicle compaction. Optimum filter strip locations are often located to the side or downhill of high-volume vehicle or pedestrian traffic areas. Filter strips are generally most effective when used to manage a small capture area, or in conjunction with other SCMs.

Consider locating filter strips in places that are generally not used such as road/highway shoulders and medians; between parked cars in parking lots; along edges of public playgrounds, school yards, plazas, and courtyards; and in place of traditional landscape planting areas around buildings and structures. Select locations where existing maintenance is difficult. Although locating filter strips on slopes will reduce the ability for infiltration, converting traditional lawn to a denser vegetative cover can provide significant stormwater benefits. Avoid placing filter strips in locations that will disturb existing forest or meadows. Such areas should be addressed by protective SCMs. Locate filter strips to prevent future conflicts for space, and provide public access if necessary.

Filter strips are appropriate for all soil types, except fill soils. The runoff reduction rate, however, is dependent on the underlying Hydrologic Soil Groups and whether soils receive compost amendments. Filter strips should not receive hotspot runoff, since the infiltrated runoff could cause groundwater contamination.

Entrance/Flow Conditions: It is important for entrance conditions or distributed flow into a filter strip to be as sheet flow. Concentrated flows of runoff should always be avoided to prevent erosion, gully formation, and preferential flow paths through a filter strip. When runoff travels across a surface for long distances, flows can begin to concentrate. For pervious contributing areas, flow path lengths greater than 150 feet should be avoided. For impervious contributing areas, flow path lengths greater than 100 feet should be avoided. The upstream edge of a filter strip should be level and directly abut the contributing drainage area. A gravel trench level spreader can be used for this purpose.

Contributing Flow Path to Filter: Filter strips are used to treat very small drainage areas of a few acres or less. The limiting design factor is the length of flow directed to the filter. As a rule, flow tends to concentrate after 100 feet of flow length for impervious surfaces, and 150 feet for pervious surfaces. When flow concentrates, it moves too rapidly to be effectively treated by a Filter Strip, unless an engineered level spreader is used. When the existing flow at a site is concentrated, a grass channel or a water quality swale should be used instead of a Filter Strip (Lantin and Barrett, 2005).

Filter Slopes and Widths: Maximum slope for filter strips is 6%, in order to maintain sheet flow through the practice. In addition, the overall contributing drainage area must likewise be relatively flat to ensure sheet flow draining into the filter. Where this is not possible, alternative measures, such as an engineered level spreader, can be used.

Proximity of Underground Utilities: Underground pipes and conduits that cross the Filter Strip are acceptable.

1.3 Design Criteria

Filter strips should be planted at such a density to achieve a 90% grass/herbaceous cover after the second growing season. Performance has been shown to fall rapidly as vegetative cover falls below 80%. Filter strips should be seeded, not sodded, whenever possible. Seeding establishes deeper roots, and sod may have muck soil that is not conducive to infiltration (Storey et. al., 2009). The filter strip vegetation may consist of turf grasses, meadow grasses, other herbaceous plants, shrubs, and trees, as long as the primary goal of at least 90% coverage with grasses and/or other herbaceous plants is achieved. Designers should choose vegetation that stabilizes the soil and is salt tolerant. Vegetation at the toe of the filter, where temporary ponding may occur behind the permeable berm, should be able to withstand both wet and dry periods. The planting areas can be divided into zones to account for differences in inundation and slope.

Stormwater must enter the filter strip or conserved open space as sheet flow. If the inflow is from a pipe or channel, an engineered level spreader must be designed in accordance with the criteria contained herein to convert the concentrated flow to sheet flow.

Diaphragms, Berms, and Level Spreaders

Gravel Diaphragms: A pea gravel diaphragm at the top of the slope is required for Filter Strips that receive sheet flow. The pea gravel diaphragm is created by excavating a 2-foot wide and 1-foot deep trench that runs on the same contour at the top of the filter strip. The diaphragm serves two purposes. First, it acts as a pretreatment device, settling out sediment particles before they reach the practice. Second, it acts as a level spreader, maintaining sheet flow as runoff flows over the filter strip.

- The flow should travel over the impervious area and to the practice as sheet flow and then drop at least 3 inches onto the gravel diaphragm. The drop helps to prevent runoff from running laterally along the pavement edge, where grit and debris tend to build up (thus allowing by-pass of the filter strip).
- A layer of filter fabric should be placed between the gravel and the underlying soil trench.
- If the contributing drainage area is steep (6% slope or greater), then larger stone (clean bank-run gravel that meets TDOT #57 grade) should be used in the diaphragm.

Permeable Berm: Filter strips should be designed with a permeable berm at the toe of the Filter Strip to create a shallow ponding area. Runoff ponds behind the berm and gradually flows through outlet pipes in the berm or through a gravel lens in the berm with a perforated pipe. During larger storms, runoff may overtop the berm (Cappiella *et al.,* 2006). The permeable berm should have the following properties:

- A wide and shallow trench, 6 to 12 inches deep, should be excavated at the upstream toe of the berm, parallel with the contours.

- Media for the berm should consist of 40% excavated soil, 40% sand, and 20% pea gravel.
- The berm 6 to 12 inches high should be located down gradient of the excavated depression and should have gentle side slopes to promote easy mowing (Cappiella et al., 2006).
- Stone may be needed to armor the top of berm to handle extreme storm events.
- A permeable berm is not needed when vegetated filter strips are used as pretreatment to another stormwater practice.

Engineered Level Spreaders: The design of engineered level spreaders should conform to the following design criteria based on recommendations of Hathaway and Hunt (2006) in order to ensure non-erosive sheet flow into the vegetated area. **Figure 3** represents a configuration that includes a bypass structure that diverts the design storm to the level spreader, and bypasses the larger storm events around the filter strip through an improved channel. An alternative approach involves pipe or channels discharging at the landward edge of a floodplain. The entire flow is directed through a stilling basin energy dissipater and then a level spreader such that the entire design storm for the conveyance system (typically a 10-year frequency storm) is discharged as sheet flow through the floodplain.

Key design elements of the engineered level spreader, as provided in **Figures 2 and 3**, include the following:

- High Flow Bypass provides safe passage for larger design storms through the filter strip. The bypass channel should accommodate all peak flows greater than the water quality design flow.
- A Forebay should have a maximum depth of 3 feet and gradually transition to a depth of 1 foot at the level spreader lip (**Figure 2**). The forebay is sized such that the surface area is 0.2% of the contributing impervious area. *(A forebay is not necessary if the concentrated flow is from the outlet of an extended detention basin or similar practice).*
- The length of the level spreader should be determined by the type of filter area and the design flow:
  - 13 feet of level spreader length per every 1 cubic foot per second (cfs) of inflow for discharges to a filter strip consisting of native grasses or thick ground cover.
  - The minimum level spreader length is 13 feet and the maximum is 130 feet.
  - For the purposes of determining the level spreader length, the peak discharge shall be determined using the Rational Equation with an intensity of 1-inch/hour.
- The level spreader lip should be concrete, wood or pre-fabricated metal, with a well-anchored footer, or other accepted rigid, non-erodible material.
- The ends of the level spreader section should be tied back into the slope to avoid scouring around the ends of the level spreader; otherwise, short-circuiting of the facility could create erosion.
- The width of the level spreader channel on the up-stream side of the level lip should be three times the diameter of the inflow pipe, and the depth should be 9 inches or one-half the culvert diameter, whichever is greater.
- The level spreader should be placed 3 to 6 inches above the downstream natural grade elevation to avoid turf buildup. In order to prevent grade drops that re-concentrate the flows, a 3-foot long section of course aggregate, underlain by filter fabric, should be installed just below the spreader to transition from the level spreader to natural grade.

Vegetated receiving areas down-gradient from the level spreader must be able to withstand the force of the flow coming over the lip of the device. It may be necessary to stabilize this area with temporary or permanent materials in accordance with the calculated velocity (on-line system peak, or diverted off-line peak) and material specifications, along with seeding and stabilization in conformance with the Tennessee Erosion and Sediment Control Handbook.

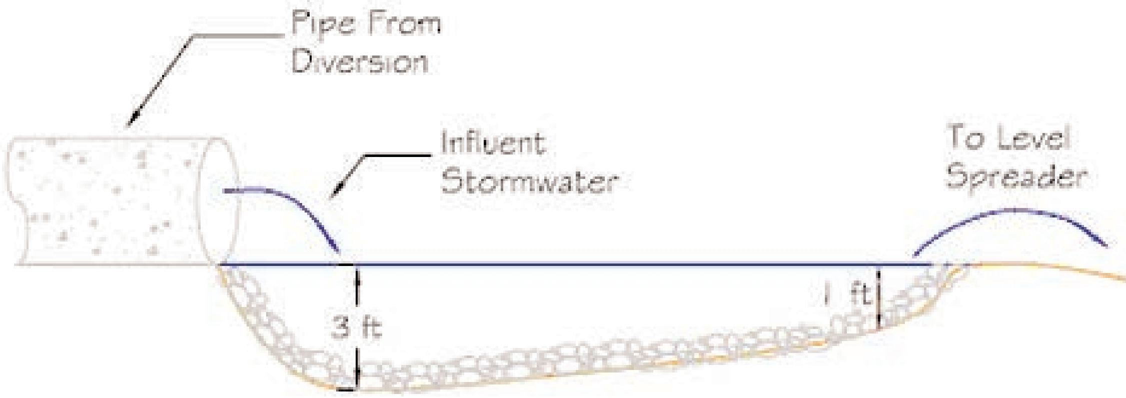

Figure 2: Level Spreader Forebay (Hathaway and Hunt 2006).

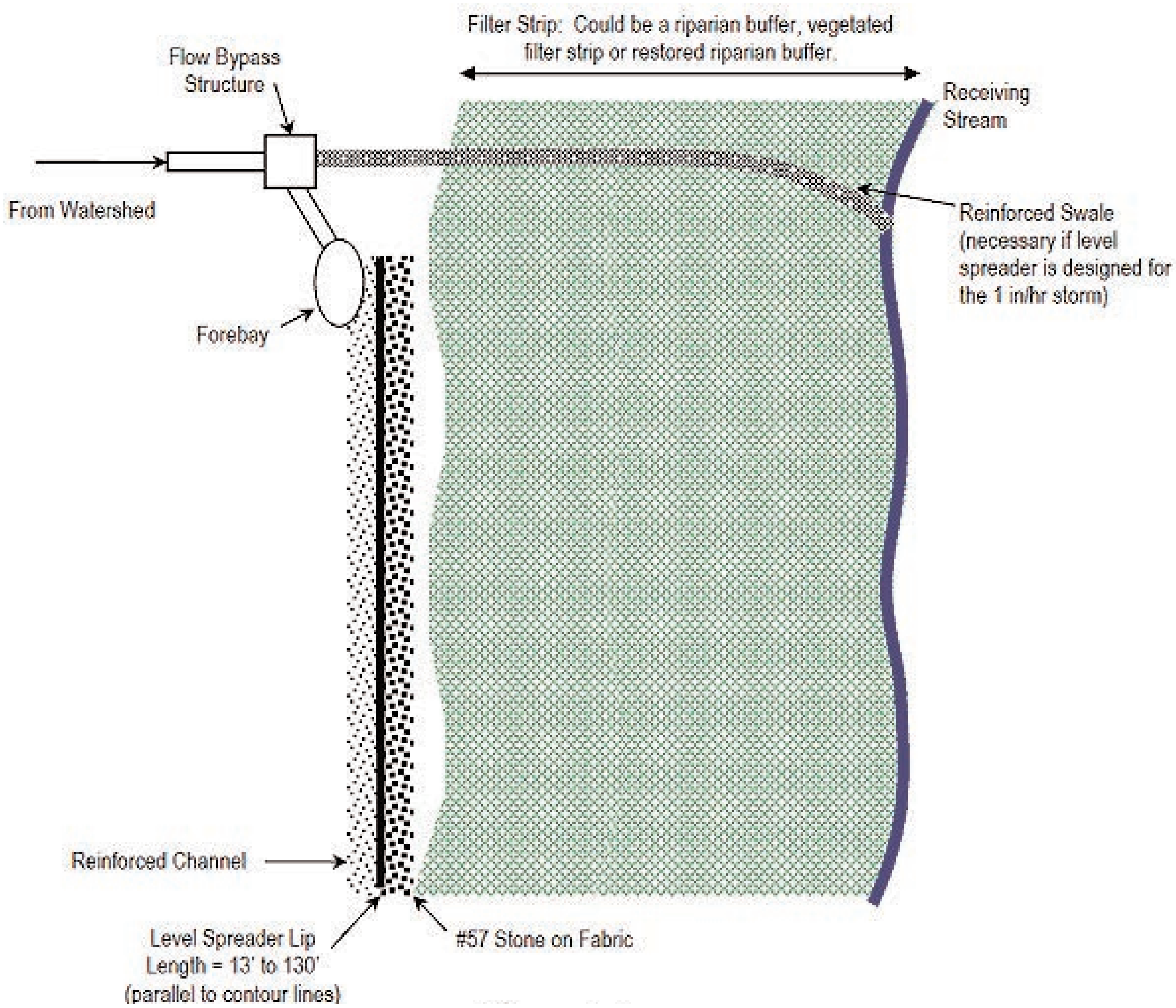

Figure 3a: Engineered Level Spreader (ELS) Plan (Hathaway 2006).

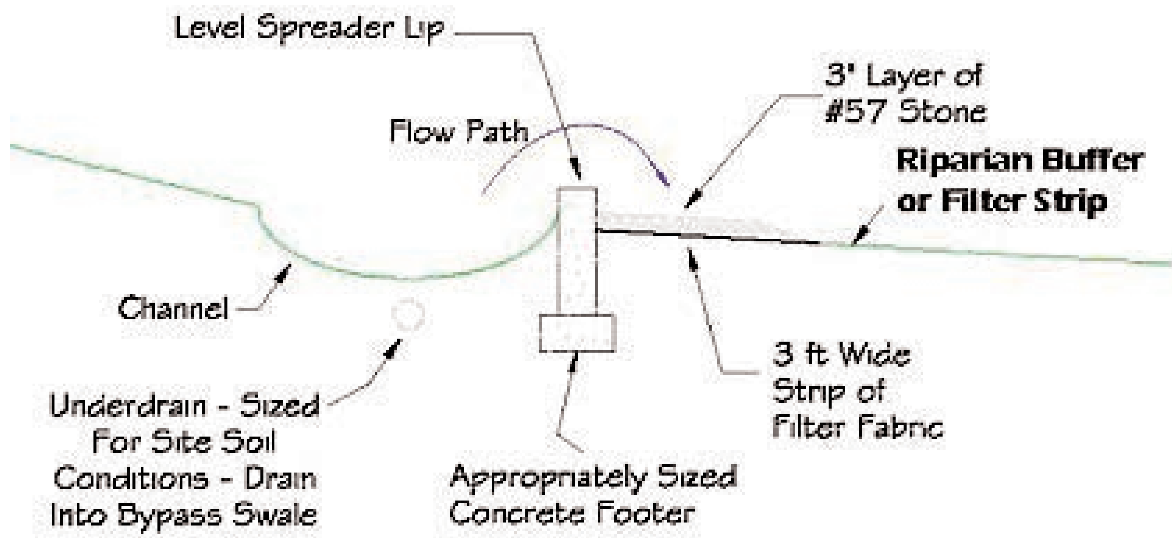

Figure 3b: Cross Section of Engineered Level Spreader (ELS) (Hathaway 2006).

Table 1: Vegetated Filter Strip Materials Specifications.

Material	Specification	Quantity
Gravel Diaphragm	Pea Gravel (#8 or ASTM equivalent) or where steep (6%+); use clean bank-run TDOT #57 or ASTM equivalent (1-inch maximum).	Diaphragm should be 2 feet wide, 1 foot deep, and at least 3 inches below the edge of pavement.
Permeable Berm	40% excavated soil, 40% sand, and 20% pea gravel to serve as the media for the berm.	
Geotextile	Needled, non-woven, polypropylene geotextile meeting the following specifications: Grab Tensile Strength (ASTM D4632): > 120 lbs. Mullen Burst Strength (ASTM D3786): > 225 lbs./sq. in. Flow Rate (ASTM D4491): > 125 gpm/sq. ft. Apparent Opening Size (ASTM D4751): US #70 or #80 sieve	
Engineered Level Spreader	Level Spreader lip should be concrete, metal, timber, or other rigid material; reinforced channel on upstream of lip. *See Hathaway and Hunt (2006).*	
Erosion Control Fabric or Matting	Where flow velocities dictate, use woven biodegradable erosion control fabric or mats that are durable enough to last at least 2 growing seasons.	
Topsoil	If existing topsoil is inadequate to support dense turf growth, imported topsoil (loamy sand or sandy loam texture), with less than 5% clay content, corrected pH at 6 to 7, a soluble salt content not exceeding 500 ppm, and an organic matter content of at least 2% shall be used. Topsoil shall be uniformly distributed and lightly compacted to a minimum depth of 6 to 8 inches.	
Compost	Compost shall be derived from plant material and provided by a member of the U.S. Composting Seal of Testing Assurance (STA) program.	

Table 2: Filter Strip Design Criteria.

Design Issue	Conserved Open Space	Vegetated Filter Strip
Soil and Vegetative Cover	Undisturbed soils and native vegetation	Amended soils and dense turf cover or landscaped with herbaceous cover, shrubs, and trees
Overall Slope and Width (perpendicular to the flow)	0.5% to 3% Slope – min. 35 ft. width 3% to 6% Slope – min. 50 ft. width The first 10 ft. of filter must be 2% or less in all cases[2]	1%[1] to 4% Slope – min. 35 ft. width 4% to 6% Slope – min. 50 ft. width The first 10 ft. of filter must be 2% or less in all cases
Sheet Flow	Max. flow length of 150 ft. from adjacent pervious areas; max. flow length of 100 ft. from adjacent impervious areas	
Concentrated Flow	Length of ELS[4] Lip = 13 lin. ft. per each 1 cfs of inflow if area has 90% cover Length = 40 lin. ft. per 1 cfs for[3] forested or re-forested areas (ELS[4] length = 13 lin. ft. min.; 130 lin. ft. max.)	Length of ELS[4] Lip = 13 lin. ft. per each 1 cfs of inflow (13 lin. ft. min.; 130 lin. ft. max.)
Construction Stage	Located outside the limits of disturbance and protected by ESC controls	Prevent soil compaction by heavy equipment
Typical Applications	Adjacent to stream or wetland buffer or forest conservation area	Treat small areas of impervious cover (e.g., 5,000 sf) close to source
Compost Amendments	No	Yes (B, C, and D soils)
Boundary Spreader	GD[4] at top of filter	GD[4] at top of filter PB[4] at toe of filter

1 A minimum of 1% is recommended to ensure positive drainage.

2 For Conservation Areas with a varying slope, a pro-rated length may be computed only if the first 10 ft. is 2% or less.

3 Where the Conserved Open Space is a mixture of native grasses, herbaceous cover and forest (or re-forested area), the length of the ELS6 Lip can be established by computing a weighted average of the lengths required for each vegetation type.

4 ELS = Engineered Level Spreader; GD = Gravel Diaphragm; PB = Permeable Berm.

Runoff sheet flows across vegetation. It is important to provide uniform sheet flow conditions at the interface of the filter strip and the adjacent land cover. Filter strips are well suited as pretreatment for other volume-reducing SCMs (such as infiltration bed). Filter strips are part of a "treatment train" approach for SCMs. They are designed to decrease the velocity of runoff from small storms and improve water quality. For best performance, contributing capture areas should be small and localized. Maximum contributing drainage area slope is generally less than 5 percent, unless energy dissipation is provided. They should have a minimum slope of 1 percent, maximum slope of 8 percent, target slope of 2 to 5 percent. Filter strip length is influenced by the slope, soil type, and vegetation type (see Figures 4 through 9). The minimum recommended length of a filter strip is 25 feet (in the direction of flow); however, shorter lengths provide some water quality benefits as well, especially adjacent to SCMs such as rain gardens (small bioretention areas). Filter strip width should always consider the width of the contributing drainage area. It is important to avoid conditions that create concentrated flow. Concentrated flow should not be discharged directly onto a filter strip. Construction of filter strip shall entail as little disturbance to existing vegetation and soils at the site as possible. See Appendix D for list of acceptable filter strip vegetation. Filter strips should never be mowed to less than 4 inches in height.

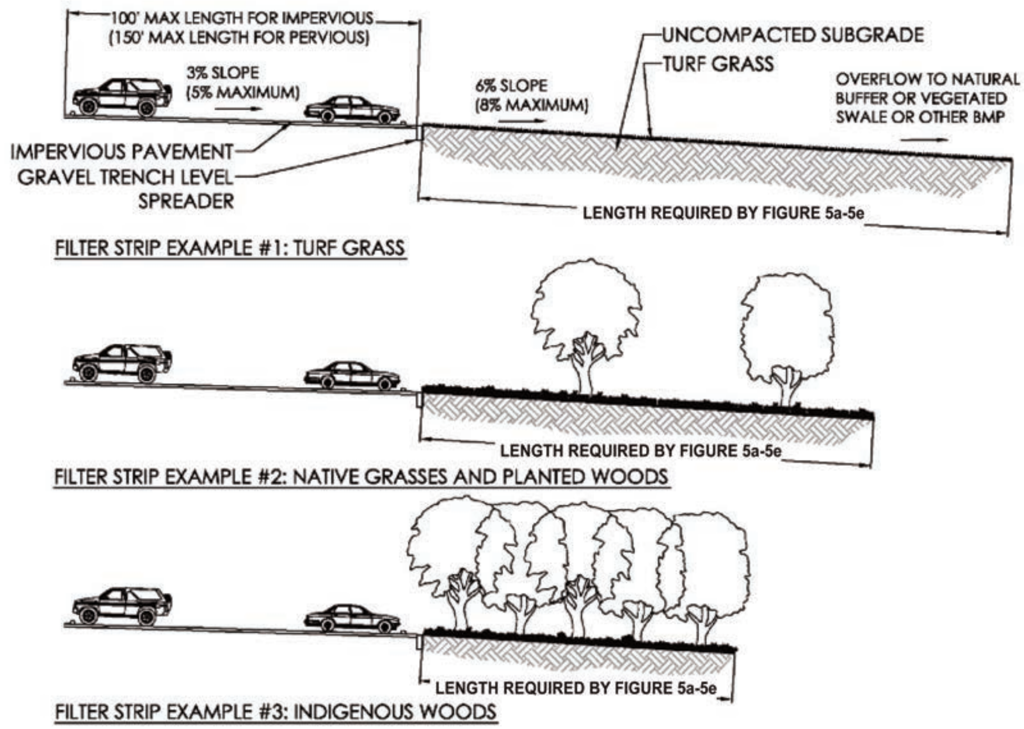

Figure 4: The width of a vegetative filter strip is determined by the slope, soil type, and vegetation type. For example, more densely vegetated strips are shorter in length than grass strips (Source: CHCRPC).

Drainage Area - Hydrologic Soil Group A & Soil Type = Sand

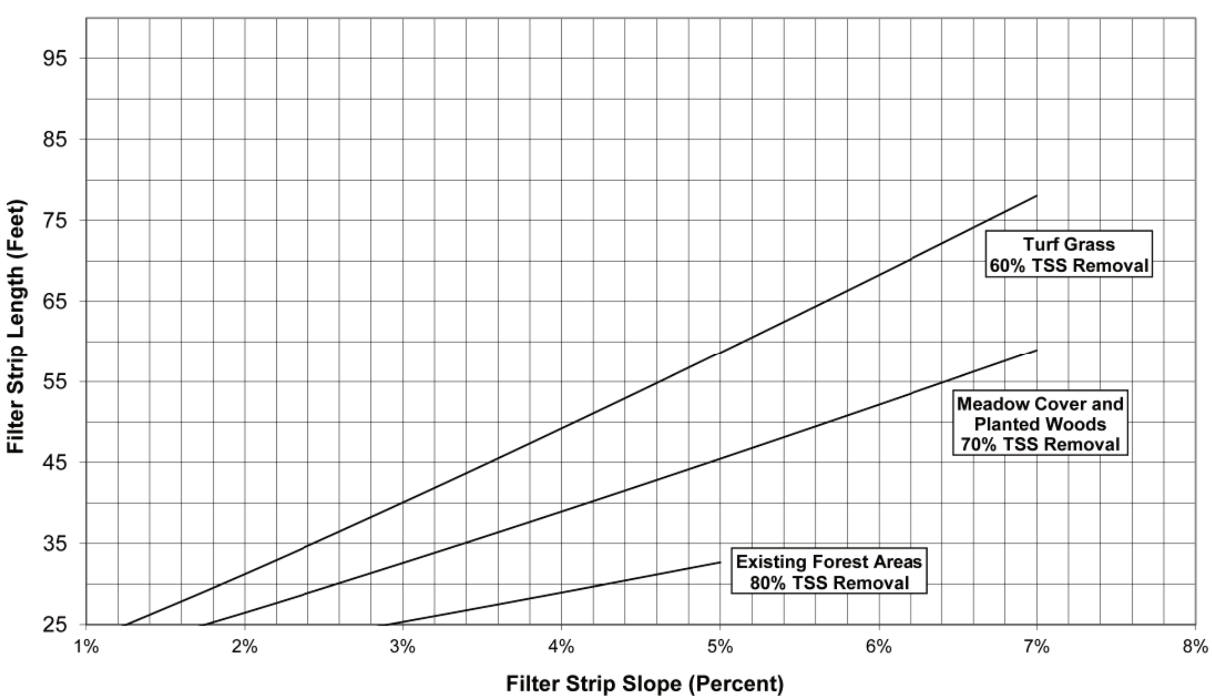

Figure 5: Graph may be used to estimate filter strip width based on soils, slope, and vegetation (Adapted from New Jersey Stormwater Management Practices Manual, Chapter 9, 2004).

Drainage Area - Hydrologic Soil Group A & Soil Type = Sandy Loam

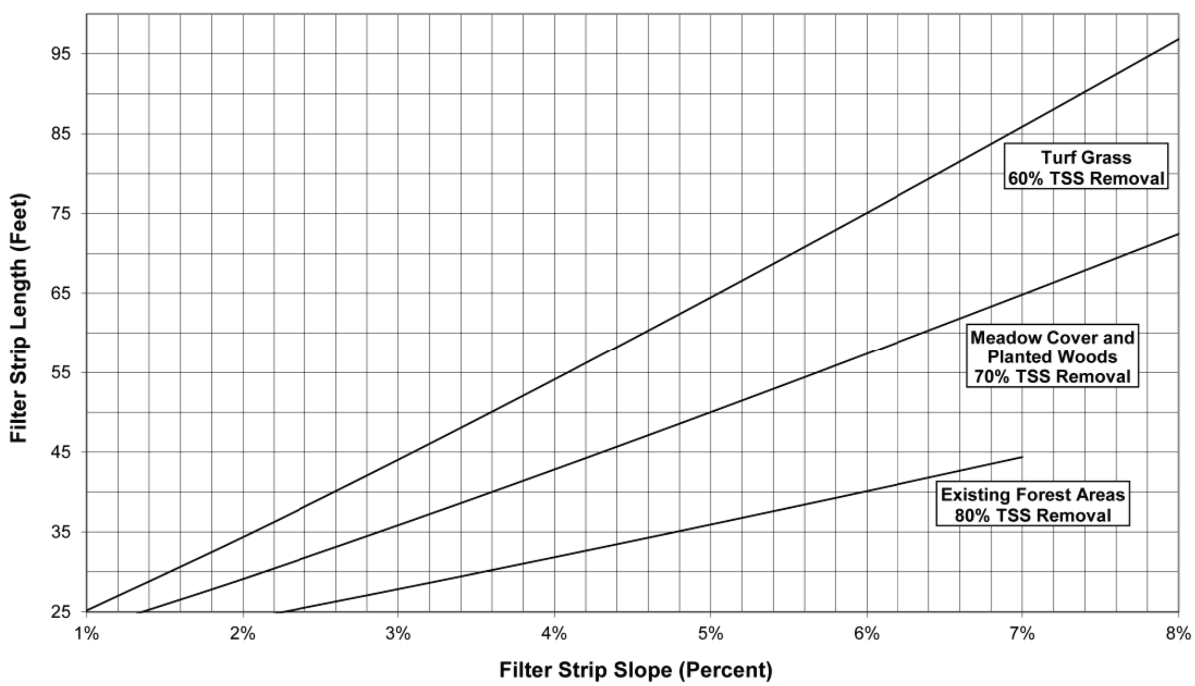

Figure 6: Graph may be used to estimate filter strip width based on soils, slope, and vegetation (Adapted from New Jersey Stormwater Management Practices Manual, Chapter 9, 2004).

Drainage Area - Hydrologic Soil Group B & Soil Type = Loam, Silt Loam

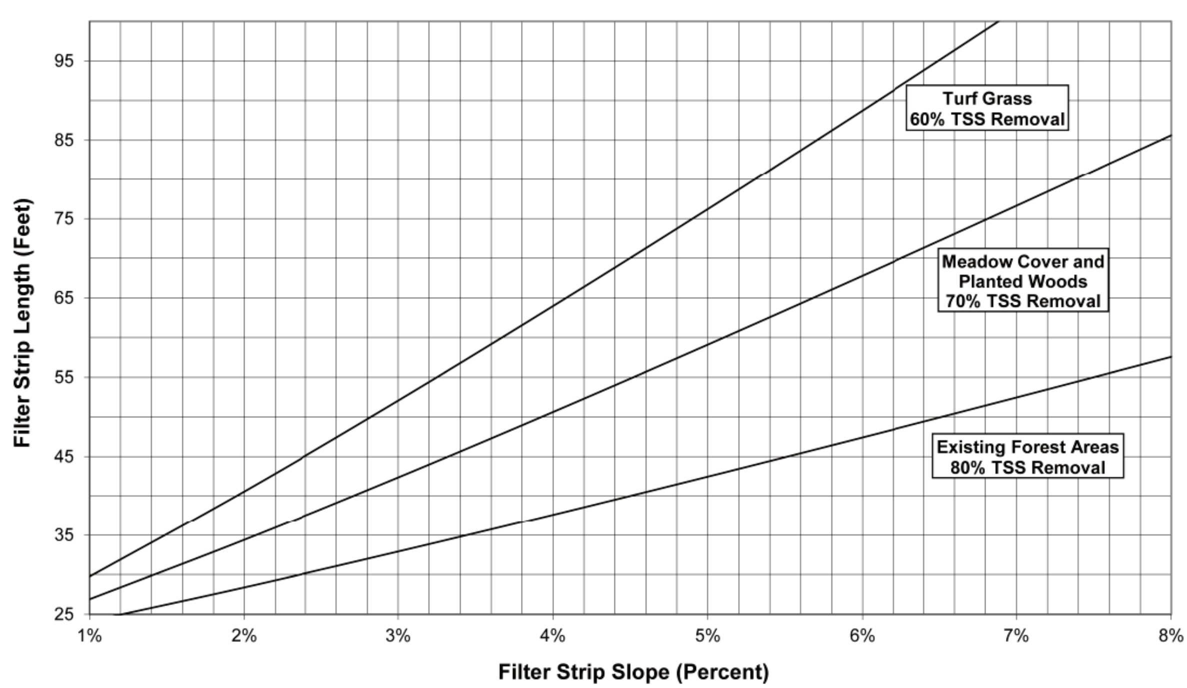

Figure 7: Graph may be used to estimate filter strip width based on soils, slope, and vegetation (Adapted from New Jersey Stormwater Management Practices Manual, Chapter 9, 2004).

Drainage Area - Hydrologic Soil Group C & Soil Type = Sandy Clay Loam

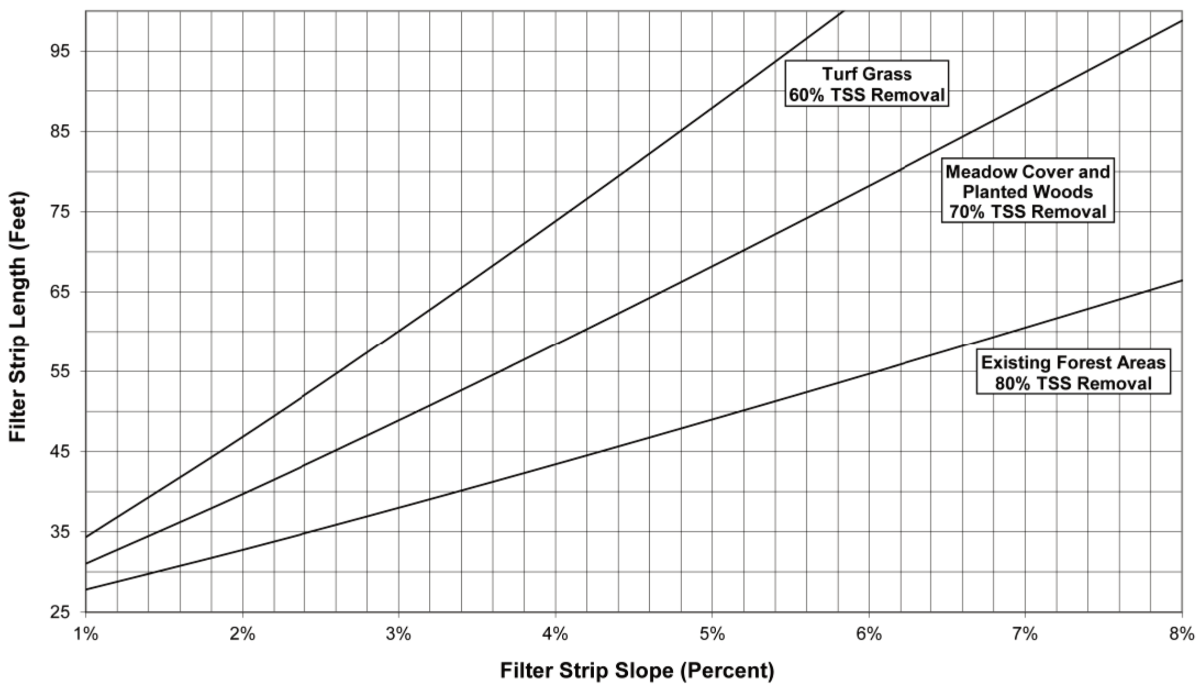

Figure 8: Graph may be used to estimate filter strip width based on soils, slope, and vegetation (Adapted from New Jersey Stormwater Management Practices Manual, Chapter 9, 2004).

Drainage Area - Hydrologic Soil Group D & Soil Type = Clay Loam, Silty Clay, Clay

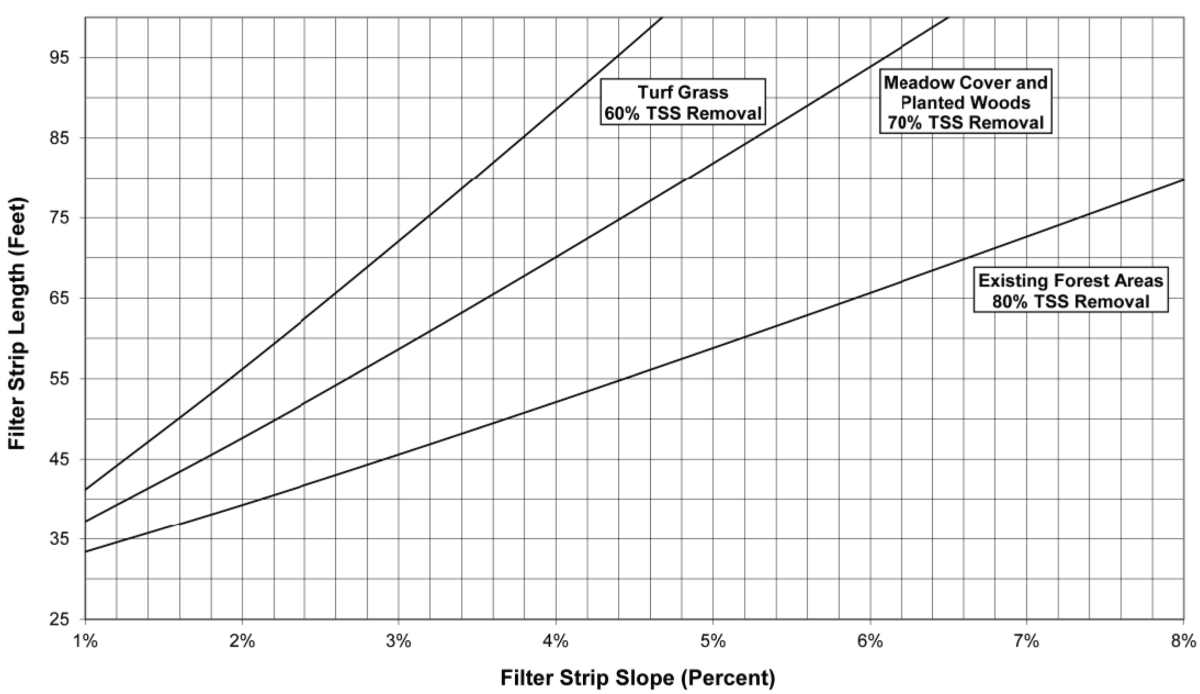

Figure 9: Graph may be used to estimate filter strip width based on soils, slope, and vegetation (Adapted from New Jersey Stormwater Management Practices Manual, Chapter 9, 2004).

Access and protection: If necessary, provide for pedestrian passage or maintenance access. Use structures, barriers, and plantings to limit access and prevent damage to soils and vegetation. Low fences, curbs, and woody vegetation are examples. Identify large filter strips on maintenance plans and with signage. This is especially important since vegetated filter strips can easily be overlooked or forgotten over time. As a result, maintenance personnel may inadvertently mow or remove vegetation.

Compost Soil Amendments: Compost soil amendments will enhance the runoff reduction capability of a vegetated filter strip when located on hydrologic soil groups B, C, and D, subject to the following design requirements:

- The compost amendments should extend over the full length and width of the filter strip.
- The amount of approved compost material and the depth to which it must be incorporated is outlined in Appendix C.
- The amended area will be raked to achieve the most level slope possible without using heavy construction equipment, and it will be stabilized rapidly with perennial grass and/or herbaceous species.
- If slopes exceed 3%, a protective biodegradable fabric or matting should be installed to stabilize the site prior to runoff discharge.
- Compost amendments should not be incorporated until the gravel diaphragm and/or engineered level spreader are installed.

1.4 Typical Details

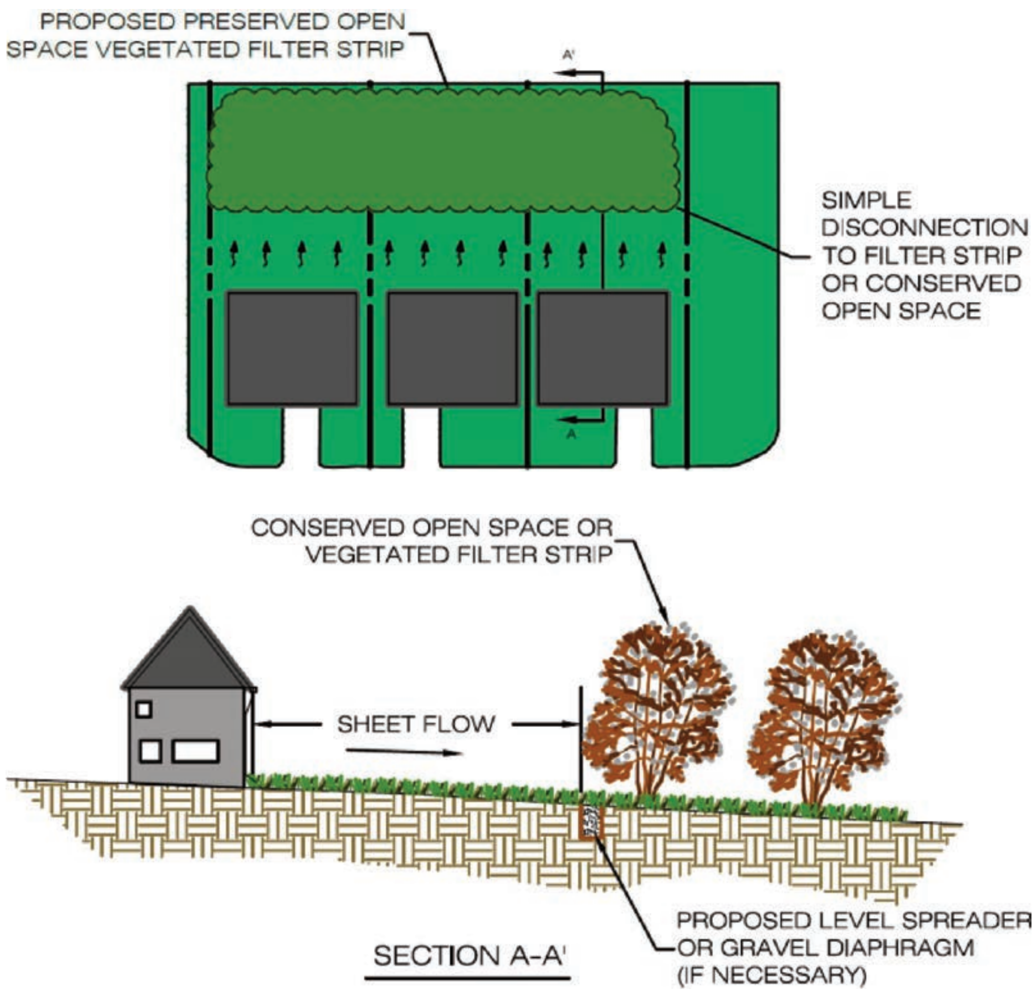

Figure 10: Simple disconnection to downstream preserved open space or vegetated filter strip (Source: Virginia, 2001).

2. Construction

2.1 Pre-Construction

For best success, filter strip areas should be protected during construction and should not be installed until site construction is complete and site stabilization has occurred. Before site work begins, filter strip boundaries should be clearly marked.

2.2 Construction

Filter strips can be within the limits of disturbance during construction. The following procedures should be followed during construction:

Step 1 Excavate Strip

a. Existing subgrade in vegetated filter strips shall not be compacted or subject to excessive construction equipment traffic. Protect areas from vehicle traffic during construction with construction fence, silt fence, or compost sock.

b. Clear and grub site as needed. Disturb as little existing vegetation as possible and avoid compaction.

Step 2 Install Vegetated Filter Strip

a. Rough grade the filter strip area, including the berm at the toe of the slope, if included. Use the lightest, least disruptive equipment possible to avoid excessive compaction and/or land disturbance.

b. Construct level spreader device at the up gradient edge of the strip. For level spreaders and other gravel trenches, do not compact subgrade *(follow construction sequence for infiltration trench).*

c. Fine grade vegetated filter strip area to line, grade, and elevations indicated. Accurate grading is essential for filter strips. Even the smallest nonconformities may compromise flow conditions.

d. If testing indicates that the soil infiltration rate has been compromised (by excessive compaction), rototill the area prior to establishment of vegetation. *Note: tilling will benefit only the top 12 to 18 inches of topsoil.*

e. Seed and vegetate according to plans, and stabilize topsoil. Plant the strip at a time of the year when successful establishment without irrigation is most likely. Temporary irrigation may be needed in periods of little rain or drought. Vegetation should be established as soon as possible to prevent erosion and scour.

f. Concurrently with step "e," stabilize seeded filter strips with appropriate temporary or permanent soil stabilization methods, such as erosion control matting or blankets. Erosion control for seeded filter strips should be required for at least the first 75 days following the first storm event of the season. If runoff velocities are high, consider sodding the filter strip or diverting runoff until vegetation is fully established.

g. Protect vegetated filter strip from sediment at all times during construction. Hay bales, diversion berms, and/or other appropriate measures shall be used at the toe of slopes that are adjacent to vegetated filter strips to prevent sediment from washing into these areas during site development.

h. When the site is fully vegetated and the soil mantle stabilized, the engineer should be notified and should inspect the filter strip drainage area at his/her discretion before the area is brought online and sediment control devices removed.

Other considerations for installation of vegetative filter strips include:

- Only vehicular traffic used for filter strip construction should be allowed within 10 feet of the filter strip boundary.
- If existing topsoil is stripped during grading, it shall be stockpiled for later use.
- Construction runoff should be directed away from the proposed Filter Strip site, using perimeter silt fence, or, preferably, a diversion dike.
- Construction of the gravel diaphragm or engineered level spreader shall not commence until the contributing drainage area has been stabilized and perimeter EPSC has been removed and cleaned out.

- Filter strips require light grading to achieve desired elevations and slopes. This should be done with tracked vehicles to prevent compaction. Topsoil and or compost amendments should be incorporated evenly across the filter strip area, stabilized with seed, and protected by biodegradable erosion control matting or blankets.
- Stormwater should not be diverted into the filter strip until the turf cover is dense and well established.

2.3 Construction Inspection

Construction inspection is critical to obtain adequate spot elevations, to ensure the gravel diaphragm or engineered level spreader is completely level, on the same contour and constructed to the correct design elevation. As-built certification should be required to ensure compliance with design standards. Inspectors should evaluate the performance of the filter strip after the first big storm to look for evidence of gullies, outflanking, undercutting or sparse vegetative cover. Spot repairs should be made, as needed.

AS-BUILT REQUIREMENTS: After the filter strip has been constructed, the developer should have an as-built certification of the filter strip conducted by a registered professional engineer. The as-built certification verifies that the SCM was installed as designed and approved. The following components should be addressed in the as-built certification:

1. Ensure level spreader is properly installed to create sheet flow.
2. Ensure vegetated filter strip or open space that receives sheet flow has minimal slope.
3. Ensure paved area drains towards pervious area.
4. Ensure the proper vegetation has been established or protected.
5. If using amended soils ensure proper installation by digging a test pit to verify the depth of mulch, amended soil and scarification.

3. Maintenance

3.1 Maintenance Document

The filter strip should be covered by a drainage easement to allow inspection and maintenance and be included in the site's maintenance document. The requirements for the maintenance document include the execution and recording of an inspection and maintenance agreement or a Declaration of Restrictions and Covenants, and the development of a Long Term Maintenance Plan (LTMP) by the design engineer *(See Appendix F for examples).* The LTMP contains a description of the stormwater system components and information on the required inspection and maintenance activities.

3.2 Maintenance Inspections

A properly designed and installed filter strip requires relatively little maintenance, much of which may overlap with standard landscaping requirements. Annual inspections are used to trigger maintenance operations such as sediment removal, spot re-vegetation and level spreader repair. Ideally, inspections should be conducted in the non-growing season when it easier to see the flow path. Inspectors should check to ensure that:

- Flows through the Filter Strip do not short-circuit the overflow control section;
- Debris and sediment does not build up at the top of the filter strip;
- Foot or vehicular traffic does not compromise the gravel diaphragm;
- Scour and erosion do not occur within the filter strip;
- Sediments are cleaned out of level spreader forebays and flow splitters; and
- Vegetative density exceeds a 90% cover in the boundary zone or grass filter.
- While vegetation is being established, pruning and weeding may be required.
- Detritus may need to be removed approximately twice per year. Perennial grasses can also be cut down or mowed at the end of the growing season.

- Inspect for pools of standing water; dewater and discharge to an approved location.
- Regrading may also be required. If a filter strip exhibits signs of poor drainage and/or vegetative cover, periodic soil aeration may be required. In addition, depending on soil characteristics, the strip may require periodic liming.
- Mow and trim vegetation to a minimum height of 4 to 6 inches.
- Mowing and maintenance must occur to ensure safety, aesthetics, and proper filter strip operation, or to suppress weeds and invasive species; dispose of cuttings in a local composting facility; mow only when filter strip is dry to avoid rutting. Fall mowing should be kept to a grass height of 6 inches to provide adequate winter habitat for wildlife.

3.3 Ongoing Maintenance

Once established, filter strips have minimal maintenance needs outside of the spring cleanup, regular mowing, repair of check dams and other measures to maintain the hydraulic efficiency of the strip and a dense, healthy grass cover. Filter strips that consist of grass/turf cover should be mowed at least twice a year to prevent woody growth.

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