**Vegetative Filter Strip**

**Measure #\_\_\_ on the Location Map**

Development Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Township, County: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Location of Vegetative Filter Strip: X: \_\_\_\_\_\_; Y: \_\_\_\_\_\_ (or N: \_\_\_\_\_\_; E :\_\_\_\_\_)

Location Description: e.g., Northwest corner of the development, near County RT 531

Location Map

|  |
| --- |
| N  E  County Route 531  Grass Swale #1  **Discharge**  Basin #1  Drywell #1  Corporation Road  Building  Parking  Lot    Vegetative Filter strip #1  Drywell #2  Access  Grass Swale #2 |

Example Map: Use aerial photo, site plan, or other graphics showing the locations of BMPs

**NOTE**

**This Field Manual is intended to be editable and adjustable in accordance with the design of stormwater management measures, the site conditions, and the special needs of responsible party. The Engineer should supplement information and best management practice to assist the responsible party to perform maintenance.**

Blue text indicates information may be deleted and or replaced as necessary.

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# Vegetative Filter Strip Overview

**Functionality**

A vegetative filter strip is a stable, evenly graded area designed to remove pollutants from the stormwater runoff that flows through it. Filter strips can be designed and planted with a variety of vegetation, or an existing on-site vegetated area with appropriate vegetation and slope can be utilized. In order to function properly, all runoff must both enter and move through the filter strip as sheet flow. Vegetative filter strips are intended to treat runoff generated from drainage areas that are uniformly graded, such as yards, parking lots and driveways, where runoff moves as sheet flow.

Vegetative filter strips treat the pollutants in stormwater runoff through filtration and biological uptake. Because these mechanisms rely on the vegetation in the filter strip, that vegetation must be dense and remain healthy; therefore, filter strips can be used wherever soil conditions, slopes and sunlight permit the establishment and maintenance of a robust plant community

Depending on the vegetation condition, slope, and length of the vegetative filter strip, the total suspended solids (TSS) removal rate ranges from 60% to 80%. For the TSS removal rate of this vegetative filter strip, please see **Hydrology Design Targets**.

**Proper care and attention in the long-term maintenance of the stormwater management measure is critically important to the safety and health of the public.**

**Type of BMP – Dry Stormwater Management Measure**

A vegetative filter strip is a type of dry stormwater management measure. Dry stormwater management measures must fully drain within 72 hours of the most recent rainfall. Standing water in excess of 72 hours is a sign of failure. It may also contribute to mosquito breeding and other health and safety issues. The design drain time shall be closely monitored to ensure that potential failure is recognized early. For the design drain time, please see **Hydrology Design Targets** in the **Basic Design Information** section.

# Basic Design Information

This section shall be filled out by the design engineer.

**Hydrology Design Targets**

1. The maximum design storm is (Water Quality Design Storm / 2 year storm / 10 year storm / 100 year storm), which corresponds to \_\_\_\_\_\_\_ inches of rain in \_\_\_\_\_ hours.
2. The design drain time is \_\_\_\_\_\_\_\_\_\_ hours.

**Hydraulic Design Targets**

* The runoff flowing over the vegetative filer strip is designed to remain as sheet flow through the vegetative filter strip.
* The outlet structure is (orifice / pipe / weir / grate / overland / other). The invert elevation of the outlet is \_\_\_\_\_\_\_\_\_\_ feet (if applicable).

**Configuration Targets**

1. The slope of the vegetative filter strip is \_\_\_\_\_\_\_\_\_\_\_\_\_%.
2. The length of the vegetative filter strip is \_\_\_\_\_\_\_\_\_\_\_ feet.
3. Vegetation
   1. The vegetation is (turf grass for 60% TSS removal rate; meadow cover for 70% TSS removal rate; planted woods for 70% TSS removal rate; existing forest area for 80% TSS removal rate).
   2. (For filter strips with planted woods)
      * The mulch layer in the vegetative filter strip is \_\_\_\_\_\_ inches thick.
4. A stone cutoff trench (is / is not) installed.

**Critical Maintenance Features**

1. Grass clippings shall be collected and properly disposed.
2. Check any eroded or channelized area, repair it immediately. Find the cause of erosion or channelization and find solution to prevent it.
3. Remove dead vegetation to keep the area aesthetic.
4. (Others to be added by the design engineer, if necessary)

**Attach the following Disturbance Notices, if applicable to the site:**

**Wetland Disturbance Notice**:

Maintenance of this BMP may disturb a wetland area. Contact NJDEP Division of Land Use Regulation for guidance and any required permit(s) before performing maintenance.

**Wildlife Disturbance Notice**:

Maintenance of this BMP may disturb or remove vegetation in an area designated to endangered and/or threatened species. Contact NJDEP Division of Fishing and Wildlife for guidance and any required permit(s) before performing maintenance.

# Visual Aid for Vegetative Filter Strip/Grass Swale Maintenance

|  |  |  |  |
| --- | --- | --- | --- |
| **C:\Users\cwu\CIWU-D\New  stormwater\NJDEP\assigments\maintenance\draft\pictures\DSCF6074.JPG**  **Courtesy of NJDOT** | | | |
| **Issue:**  **Corrective Action:**  **Preventative Action:** | | **The inlet to the swale is clogged by sediment and leaves.**  **Clear and remove sediment and leaves.**  **Preventative Action: Routine inspection and removal of sediment and debris.** | |
|  | | | |
| **C:\Users\cwu\CIWU-D\New  stormwater\NJDEP\assigments\maintenance\draft\pictures\P1060400.JPG**  **Courtesy of NJDOT** | | | |
| **Issue:**  **Corrective Action:**  **Preventative Action:** | | | **The sediment and loss of vegetation indicates that the swale is not well drained.**  **Re-grade the swale to ensure proper drainage. A steeper slope may be required but must ensure that all criteria are met for the required TSS removal rate (see the Basic Design Information section). Revegetate the grass swale.**  **Routine inspection and monitoring of the drain time.** |
| **C:\Users\cwu\CIWU-D\New  stormwater\NJDEP\assigments\maintenance\draft\pictures\P5055473.JPG**  **Courtesy of NJDOT** | | | |
| **Issue:**  **Corrective Action:**  **Preventative Action:** | **The loss of vegetation on the side slope and bottom likely indicate an erosion problem.**  **Re-grade the side slope of the swale to prevent erosion and revegetate the swale.**  **Routine inspection and reseeding the soil before the erosion becomes severe.** | | |
|  | | | |
| **C:\Users\cwu\CIWU-D\New  stormwater\NJDEP\assigments\maintenance\draft\pictures\P1060226.JPG**  **Courtesy of NJDOT** | | | |
| **Issue:**  **Corrective Action:**  **Preventative Action:** | **Overgrown and dead vegetation in swale.**  **Remove dead and unwanted vegetation.**  **Routine inspection and mowing of the swale.** | | |
| **C:\Users\cwu\CIWU-D\New  stormwater\NJDEP\assigments\maintenance\draft\pictures\P3220360.JPG**  **Courtesy of NJDOT** | | | |
| **Issue:**  **Corrective Action:**  **Preventative Action:** | **Ponding in swale. Vegetation loss due to long term inundation.**  **Clear the outlet structure, clear the sediment in the outlet, and re-grade the swale to allow for better drainage.**  **Routine inspection and cleaning.** | | |
|  | | | |
| **C:\Users\cwu\CIWU-D\New  stormwater\NJDEP\assigments\maintenance\draft\pictures\0 DSCF6169.JPG**  **Courtesy of NJDOT** | | | |
| **Issue:**  **Corrective Action:**  **Preventative Action:** | **The left slope of the swale is eroded by runoff from the roadside.**  **Re-grade the slope or provide energy dissipation to reduce the flow velocity and alleviate the erosion. Revegetate the slope.**  **Routine inspection and reseeding of bare soil.** | | |

# Reference Documents

Documents to be placed in this field manual should include the following:

* As-built Drawings with Drainage Plans
* Landscaping Plan

**Attach Reference Documents Here**

# Inspection Checklist / Maintenance Actions

**Vegetative Filter Strip**

**Checklist** (circle one)**:** Quarterly / Annual / Monthly / Special Event Inspection

**Checklist No.** \_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Inspection Date:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Date of most recent rain event: \_\_\_\_\_\_\_\_\_\_**

**Rain Condition** (circle one):

Drizzle / Shower / Downpour / Other \_\_\_\_\_\_\_\_\_\_\_\_\_

**Ground Condition** (circle one):

Dry / Moist / Ponding / Submerged / Snow accumulation

**The inspection items and preventative/corrective maintenance actions listed below represent general requirements. The design engineer and/or responsible party shall adjust the items and actions to better meet the conditions of the site, the specific design targets, and the requirements of regulatory authorities.**

|  | **For Inspector** | | | **For Maintenance Crew** |
| --- | --- | --- | --- | --- |
| **Component No. Component Name** | **Inspection Item and Inspection Item No.** | | **Result** | **Preventative / Corrective Maintenance Actions** |
| A  Filter Strip Area | 1 | Standing water is present after the design drain time  The observed drain time is approximately \_\_\_\_\_\_\_\_\_ hours. | Y\_\_  N\_\_ | Remove excessive sediment/debris    Check whether the outlet is clogged (if applicable)  Re-grade the slope to allow the swale to drain within the design drain time. Revegetate if necessary  If standing water is present longer than 5 days, report to mosquito commission.  Work Order #\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 2 | Excessive sediment, silt, or trash accumulation in filter strip | Y\_\_  N\_\_ | Remove sediment, silt, and trash |
| 3 | Erosion or channelization is present | Y\_\_  N\_\_ | Check whether the incoming flow is concentrated before entering the filter strip. If concentrated, re-grade the edge of the filter strip to ensure sheet flow  Install a stone cutoff trench to distribute the flow evenly  Work Order #\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 4 | Animal burrows/rodents are present | Y\_\_  N\_\_ | Pest control  Work Order # \_\_\_\_\_\_\_\_\_\_ |
| 5 | Sediment and debris on the edge between the contributing drainage area and the vegetative filter strip | Y\_\_  N\_\_ | Clear and remove sediment and debris |
| Note: | | | | |
| B  Vegetation | 1 | Large spot(s) showing bare soil | Y\_\_  N\_\_ | Vegetative cover must be maintained at 85%. Revegetate the entire area if 50% or more vegetation has been lost.  Check Landscaping plan for guidance (if available)  Work Order # \_\_\_\_\_\_\_\_\_\_ |
| 2 | Grass clippings are not collected and removed | Y\_\_  N\_\_ | Remove the grass clippings |
| C  Outlet  (if applicable) | 1 | Trash or debris accumulation more than 20% | Y\_\_  N\_\_ | Clean and remove  Determine source of trash and address to reduce future maintenance costs or BMP failure |
| 2 | Trash rack is damaged or rusted greater than 50%  Trash rack is bent, loose, or missing parts | Y\_\_  N\_\_ | Repair or replace trash rack  Work Order #\_\_\_\_\_\_\_\_\_\_ |
| 3 | Outlet components (e.g., orifice plates or weir plate) skewed, misaligned, or missing | Y\_\_  N\_\_ | Repair or replace component  Work Order #\_\_\_\_\_\_\_\_\_\_ |
| 4 | Discharge pipe apron is eroded or scoured | Y\_\_  N\_\_ | Restabilize the discharge riprap apron  Work Order #\_\_\_\_\_\_\_\_\_\_ |
| 5 | Standing water is present in the outlet structure longer than 72 hours | Y\_\_  N\_\_ | Clean out the standing water  Work Order # \_\_\_\_\_\_\_\_\_\_ |
| Note: | | | | |

**Follow Up Items (Component No. / Inspection Item No.):**

(e.g., B/1, C/2)

**Associated Work Orders: # \_\_\_\_\_\_, # \_\_\_\_\_\_, # \_\_\_\_\_\_, # \_\_\_\_**\_\_**, # \_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Inspector Name Signature Date**

**Report issues to the local authority and mosquito commission as required by local ordinances and regulatory authorities.**

**File this checklist in the Maintenance Log after performing maintenance.**

# Preventative Maintenance Record

Corresponding Checklist No. \_\_\_\_\_\_\_\_

Component No.\_\_\_\_\_\_\_, Inspection Item No.\_\_\_\_\_\_\_\_

**Work Logs**

|  |  |  |
| --- | --- | --- |
| **Activities** | **Components** | **Date Completed** |
| Sediment/debris removal  **Sediment removal should take place when the ground is thoroughly dry.** | A – Filter Strip Area |  |
| C – Outlet (if applicable) |  |
|  |  |  |
| Vegetation removal | B – Vegetation |  |
|  |  |  |
| (List additional tasks, if applicable) |  |  |

All use of fertilizers, pesticides, mechanical treatments, and other means to ensure optimum vegetation health must not compromise the intended purpose of the stormwater management measure. The fertilizer applied is \_\_\_\_\_\_\_\_\_\_\_\_ (type), and \_\_\_\_\_\_\_\_\_ (quantity per usage) is applied \_\_\_\_\_\_\_\_\_\_\_\_\_ (frequency of use).

Debris, sediment, and trash are handled (onsite / by \_\_\_\_\_\_\_\_\_\_\_\_ (contractor name) to disposal site \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_). (See Part I: Maintenance Plan – Disposal Plan Section)

**Crew member:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_**

(name/ signature)

**Supervisor:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_**

(name/ signature)

**File this Preventative Maintenance Record in the Maintenance Log after performing maintenance.**

# Corrective Maintenance Record

1. **Work Order #** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date Issued** \_\_\_\_\_\_\_\_\_\_\_\_\_
2. **Issue to be resolved**:

(e.g., Re-grading is required. Replanting is required.)

1. The issue was from **Corresponding Checklist No. \_\_\_\_\_\_\_\_, Component No.** (e.g., C – Outlet), **Inspection Item No.**  (e.g., 2, 3)  **.**
2. **Required Actions**

|  |  |  |
| --- | --- | --- |
| **Actions** | **Planned Date** | **Date Completed** |
| Revegetation |  |  |
| Re-grading |  |  |
| (If there are additional tasks, list them here.) |  |  |

1. **Responsible person(s):**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Special requirements**
   * Time of the season or weather condition:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   * Tools/equipment:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   * Subcontractor (name or specific type):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Approved by** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Date** \_\_\_\_\_\_\_\_\_\_\_\_\_

(name/signature)

**Verification of completion by** \_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_\_\_\_\_\_ **Date** \_\_\_\_\_\_\_\_\_\_\_\_\_

(name/signature)

**File this Corrective Maintenance Record in the Maintenance Log after performing maintenance.**