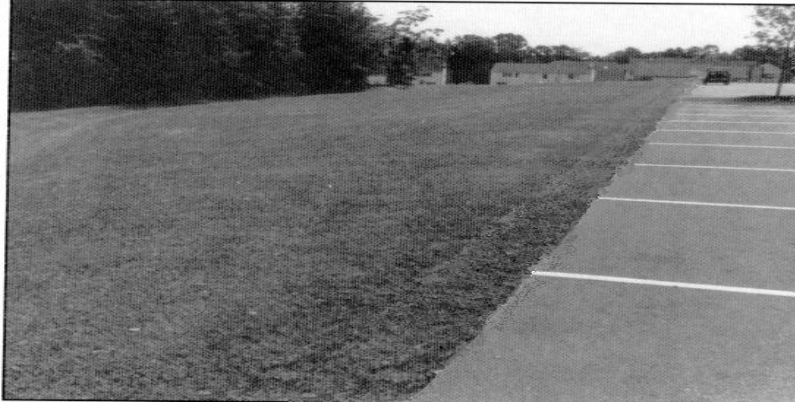


NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS URBAN MANUAL
PRACTICE STANDARD

FILTER STRIP

(acre)
CODE 835



(Source:OH Rainwater and Land Development)

DEFINITION

A created or preserved area of vegetation designed to remove sediment and other pollutants and to enhance the infiltration of surface water runoff.

PURPOSE

The principal purpose of this practice is to remove sediment and other pollutants from runoff water by filtration, deposition, infiltration, absorption, and vegetative uptake. Another purpose is to reduce runoff quantities from impervious surfaces by infiltrating it into the ground.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied in a variety of urban land uses where surface water runoff is discharged as overland sheet flow. Some typical locations of vegetated filter strips include:

1. Adjacent to roadways, parking lots, and other impervious surfaces to

filter and convey runoff before it is discharged to swales, storm sewers, or surface water bodies

2. Lawns where roof downspouts are discharged to disperse and infiltrate runoff
3. Adjacent to wetlands, streams, ponds or lakes, or conservation practices to provide the runoff mitigation benefits described above and to serve as a wildlife habitat buffer
4. On construction sites and land undergoing development to filter sediment from overland sheet flow

CRITERIA

The maximum drainage area to a filter strip shall be 5 acres.

Vegetative filter strips shall have slopes 15% or less.

The minimum length (dimension parallel to flow path) of the filter strip is determined by the drainage area being treated and the width of the filter strip.

The filter strip length shall be at least 1/2 the unit area length. The unit area

length is calculated by dividing the drainage area to the filter strip, in square feet, by the filter strip width (dimension perpendicular to flow path), in feet. The minimum filter strip length shall be 5 feet except on construction sites where the minimum length shall be 25 feet.

The width (dimension perpendicular to flow path) of the filter strip determines the required length of the filter strip. The wider the filter strip, the shorter the required filter strip length. The width shall be as near the same width as the impervious area being treated.

Some applications (e.g., roof downspouts) may require a level spreader to prevent a concentrated flow path through the filter strip. Level spreaders shall be installed according to the requirements in practice standard LEVEL SPREADER 870. For parking lots and roadways, a level spreader will not be needed if the edge of the contributing runoff area is reasonably level and uniform. Level spreaders shall be installed in the filter strip every 50 feet of filter strip length on slopes greater than 5% and every 100 feet of filter strip length on slopes 5% or less.

The maximum flow velocity through the filter strip shall be calculated for the 10-year frequency, 24-hour duration storm event and shall not exceed the maximum permissible velocities as described in practice standard GRASSED LINED CHANNEL 840.

Vegetation shall follow the requirements of practice standard PERMANENT VEGETATION 880 and be protected with an erosion control blanket meeting the requirements of practice standard EROSION BLANKET 830 or mulched meeting the requirements of practice

standard MULCHING 875. In place of permanent seeding, the filter strip may be vegetated with sod following the requirements of practice standard SODDING 925.

The filter strip vegetation should be fully established before the contributing impervious surface is created and its runoff directed onto the filter strip. Where this is not possible, the filter strip shall be vegetated with sod.

CONSIDERATIONS

Nearly 80% of the maximum potential settleable solids removal is achieved with the sizing criteria listed above. The efficiency can be increased to nearly 90% if the filter strip length is increased so that it has a length equaling or exceeding the unit area length.

Ideally, filter strips function best on slopes 5% or less. However, on slopes 1 % or less, vegetation used should be tolerant of saturated soil conditions.

It is critical that appropriate soil stabilization materials be applied immediately after seeding on all vegetative filter strips to minimize rill development during cover establishment. Due to the added runoff volumes coming from the impervious surfaces, an erosion control blanket will be necessary in most installations. Mulch may be adequate on relatively flat slopes where the contributing drainage area is small. In addition to stabilizing soils, these materials should significantly aid seed germination and early plant establishment.

Native prairie vegetation should be used if possible. Native vegetation has distinct advantages over turf grass,

including denser, deeper root structure to enhance infiltration; reduced maintenance needs (particularly less need for herbicides and fertilizer); and enhanced wildlife habitat.

If site constraints prevent the installation of broad filter strips meeting the specified sizing criteria, even narrower strips can provide substantial stormwater mitigation benefits in contrast to conventional curb and gutter storm sewer approaches.

Protect the filter strips from heavy foot and vehicular traffic during construction to prevent compaction and loss of infiltration capacity.

The filter strip area should be cleared of trees, stumps, brush, rocks, and similar materials if they are likely to interfere with installation of the filter strip (e.g., cause short-circuiting or concentrations of flow). Ideally, uniform, well vegetated strips of natural/native vegetation should be preserved as filter strips since their infiltration capacities are likely to be greater if grading is avoided.

On construction sites and other areas with bare soil where the filter strip is being used as a temporary sediment control technique, it is critical that temporary stabilization be applied to exposed soils and that concentrated flow through the filter strip be avoided. If the potential for concentrated flow exists, consideration should be given to construction of other sediment control practices above the filter strip. These practices shall meet the requirements of practice standards found in this manual such as practice standard TEMPORARY SEDIMENT TRAP 960, and SILT FENCE 920.

PLANS AND SPECIFICATIONS

Plans and specifications for installing filter strips shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the following items:

1. Location of the practice
2. Length and width of the filter strip
3. Slope of the filter strip
4. Required appurtenant practices such as level spreaders or temporary sediment basins
5. Grading requirements, topsoil stockpiling and utilization requirements
6. Soil preparation, seeding and temporary soil stabilization (i.e., erosion control blanket or mulching) requirements

All plans shall include installation, inspection, and maintenance schedules with the responsible party identified.

Standard drawing FILTER STRIP – GRASSED IL-535 may be used as the plan sheet.

OPERATION AND MAINTENANCE

On active construction sites, the filter strip shall be inspected after every runoff producing rain and repairs made as needed. After construction, filter strips should be inspected during and after major storm events, particularly during the first one or two years. After the first one or two years, the filter strip may be inspected each spring and after major storm events.

Filter strips should be inspected for proper distribution of flows and signs of erosion. The filter strip should be kept

free of litter. Irrigation needs should be minimal except during extended dry periods. Periodic aeration of the soils may be beneficial if the underlying soils have a high clay content, or there is difficulty in maintaining a good vegetative cover due to compaction.

If erosion is discovered, the eroded areas should be filled, reseeded, and mulched. Then the causes for the erosion should be determined and prevented from recurring.

Maintain the vegetation at the most dense stand possible.

Filter strips vegetated with turf grass should be mowed and the residue harvested a minimum of two or three times a year to promote good growth and vegetative density at ground level, nutrient removal from the system, and filtering ability.

Caution should be used when applying herbicides to filter strips or adjacent areas to minimize pollution to the water resources being protected.

Filter strips vegetated with native species should be managed through prescribed burning once every two to three years, after the vegetation is established. Where prescribed burning is not feasible, mowing may be substituted. In contrast to turf grass, native vegetation should be mowed higher and less frequently.

Filter strips that have accumulated so much sediment that they are higher than adjacent areas should be disked or graded as necessary to reestablish shallow sheet flow conditions, and be reseeded.

REFERENCES

Dreher, D.W. and T.H. Price, 1997. Reducing the Impacts of Urban Runoff: The Advantages of Alternative Site Design. Northeastern Illinois Planning Commission, Chicago, IL

Ohio Department of Natural Resources, Division of Soil and Water Conservation, 1996. Rainwater and Land Development. 2nd ed., OH

Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1992. Virginia Erosion and Sediment Control Handbook, 3rd ed., VA

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