Appendix B Vegetative (Grass) Swales and Erosion Control Matting

The steps in Section 7.6.9 of the ConnDOT Drainage Manual should be followed for drainage swale design.

Grass Adequate?

Vegetative (grass) lined swales are preferred for storm water quality (treatment) purposes. Therefore the designer should check, with computations, whether grass is an adequate lining for the proposed swale. The 10-year discharge and grass "Retardance Class C" (HEC-15) is used. Include this computation in the drainage report. ***Please note that "Retardance Class C" is a nomenclature for certain types of grasses used in the HEC-15 design manual and is not a contract item and should not be called out on the plans.***

YES

Where grass is determined to be **adequate** for the design conditions, a temporary (biodegradable) lining is required to convey runoff until grass (turf) can be established in the swale. Erosion Control Matting, Class 2, Flexible Channel Liners (ConnDOT Approved Products List) is the item to be used for temporary linings. The types and criteria for erosion control matting are found on pages 7.6-11 and 7.6-12 of the ConnDOT Drainage Manual. The temporary lining is evaluated with the 2-year discharge. The computed width of flow in the swale determines the width of matting to be called for on the plans. Include this computation in the drainage report.

The limits of the erosion control matting should be shown on the plans and the width and type of matting should be called out. For example, an appropriate call out that is consistent with the ConnDOT payment item would be: "2m – Erosion Control Matting – Type F" or 2m – Erosion Control Matting – Type H (Permanent)." *It is generally not necessary to call out "grass or vegetative swale" on the plans where the swale is formed incidental to construction or reconstruction of the roadway in a cut section. First, grass is covered under the payment item "Turf Establishment", which is called out on the typical cross sections and often the limits are shown on the plans. Second, the grading of the swale is included in the payment items Earth Excavation or Rock Excavation.*

NO

Where grass is determined to be **inadequate** for the design conditions, a permanent, (non-biodegradable) synthetic erosion control matting can be used as turf reinforcement in lieu of using riprap for the swale lining. As turf is established, the roots of the grass become entangled in the matting and the permissible shear stress of this combination is greater than the permissible shear stress of the grass or the mat by itself. Since the matting is needed for both the permanent and the temporary condition, the matting is designed for the 10-year discharge and the permissible shear stress of the mat. Include this computation in the drainage report. Note that if a synthetic mat is adequate, the computed flow depth and width in the swale for the grass lining determines the width of the matting to be called out on the plans (the roughness or manning's n-value of the grass-mat combination is greater than the unvegetated mat) and is used to determine if the capacity of the swale section is adequate. A temporary lining is not required, as the mat has already been designed for the permanent use (10-year discharge) and will therefore be adequate for temporary erosion control (2-year discharge). Permanent, (non-biodegradable) synthetic erosion control matting is designated on the Department's Approved Products List as "Type H" matting. When a permanent matting is required it should be so noted on the plans.

Swale Inlets Typically swale inlets are Type "C-L" catch basins with paved aprons and are designed for full interception even when they are located on grade (not at a low point) as they are depressed 127-mm (5 inches) below the finished grade. See Chapter 11, Appendix B, for grading at Type "C-L" catch basins. The capacity of the inlet is based on the maximum head (127-mm) over the grate without bypassing the inlet after an allowance of an appropriate clogging factor. The number and spacing of inlets required in a proposed swale is based on the inlet capacity noted above, an allowable flow depth considering freeboard and a reasonable width of flow.