



adams, rehmman & heggan
associates inc.

reply to
hammorton

July 14, 1998

Helen E. Fox, Association Manager
Sturbridge Woods Association, Inc.
PO Box 159
West Berlin, NJ 08091

Re: Swale Maintenance Guidelines
ARH #74-11016

Dear Helen:

Joseph Pantalone has suggested that I review and respond to your letter of June 30, 1998. We all appreciate the Trustees' desire to clearly understand the issues of swale maintenance.

1. **Side Wall Slopes:** The purpose of designing the swales with side slopes of 45° or less was to allow easier maintenance. Unfortunately, a 45° slope or 1 to 1 slope is not easily mowed. The problem with the original plans was that a detail was used to describe the swale. The roads in the development pass through land that is not uniform, making the side slopes of the swale non-uniform.

Side slopes greater than 45° become much more difficult to maintain. We would not recommend establishing any slopes greater than 45° or 1 to 1.

We would not recommend altering the swales that have established themselves with grass. This would de-stabilize them causing erosion problems.

2. **Wire Mesh Covers:** Placing wire mesh over the openings of the drain pipes will cause debris, leaves, etc. to accumulate. This debris will cause flooding by not allowing water to pass into the pipe.

We would discourage the use of any covering over the drain pipe under the size of 18" or greater. A bar screen can then be used on the larger size pipe. A bar screen is composed of vertical rods spaced 3" apart.

3. **Alternative Ground Cover:** We are interpreting this question to mean, is there an alternative ground cover for the stone used in the "bottom" of the swales.

The reason that stone is preferred is the velocity of the storm water will normally wash away any material that is not heavy enough or rooted in the soil.

Grass can be used in the bottom of the swale. Grass is difficult to establish since the seeds can be washed away prior to taking root. Sod can be used but it should be pegged in place to prevent washouts. Erosion matting with grass seed contained within it can also be used.

4. **Shrubs or Trees:** We would not recommend planting shrubs or trees on the slopes of the swales. Shrubs could cover the sides of the swale which would impede flow, adversely affecting the operation of the swale.

We would not allow trees or shrubs to be planted in the swale for the same reason.

5. **Maximum Diameter of Stones:** The size of the stone is based upon (a) *smallest size*: the size that will resist movement from the velocity of flow; and (b) *largest size*: the size that will not impede flow or reduce volume of the swale.

River cobbles are normally 4" to 6" in size. These stones effectively resist movement and do not take up too much volume.

Long, flat field stone, slate, etc. which may be 18" to 24" long, but 1" thick can be laid along the swale and not lose volume.

The stone must not impede flow or take volume out of the swale.


6. **Maintenance of Stone:** The plans for the development call for a 6" thick stone layer. The stones do not have to be turned except for aesthetic purposes.

The grass clippings, leaves, etc. should be raked from the swale periodically. This will prevent clogging of the downstream pipes and inlets.

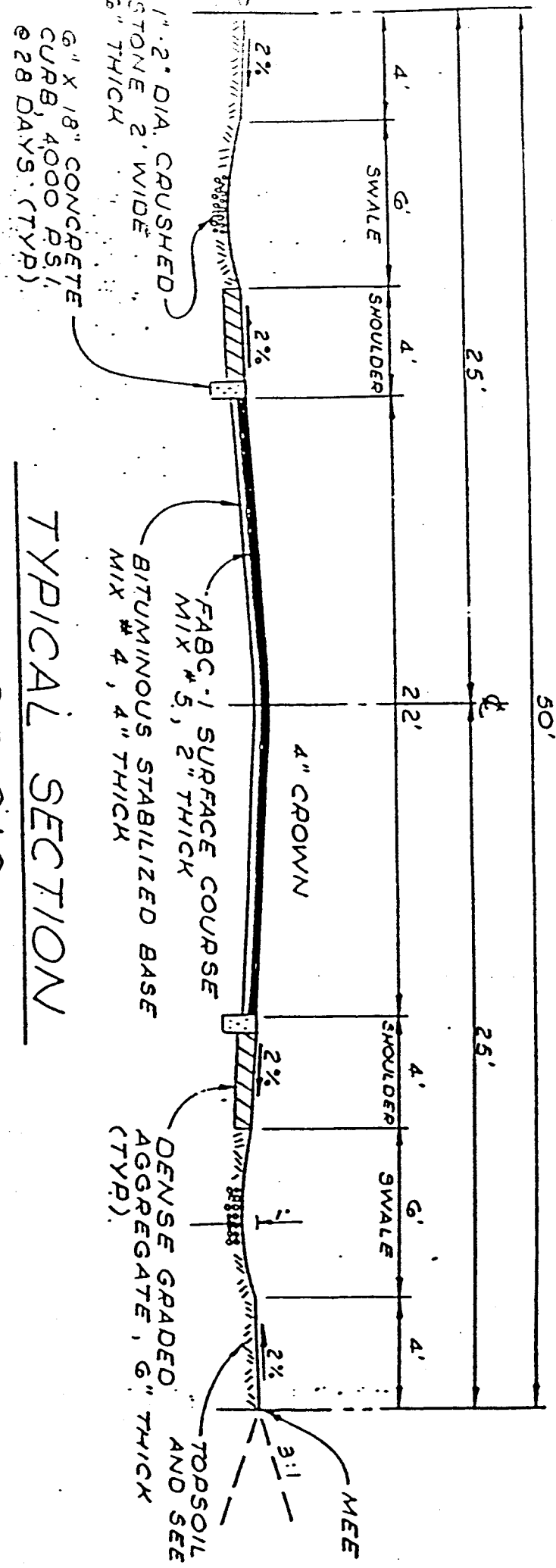
If the stones are covered by grass or mulch, it will not affect the operation of the swale unless the mulch is carried downstream and blocks drainage paths.

Hopefully, these responses to your letter will assist the homeowners in their continued maintenance of the swales.

Sincerely,


Chris Rehmann, PE, LS, CME
Township Engineer

cc: Fred Mann, Voorhees Administrator
Joseph Hale, Voorhees Engineering Dept.
Joseph Pantalone



TYPICAL SECTION

CUL-DE-SAC

NO SCALE