

## Enkamat<sup>®</sup> Maintenance Program

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A maintenance program is developed to ensure that the function of the Enkamat Turf Reinforcement Mat (TRM) will perform as it was designed - to minimize erosion and protect the established vegetation during extreme storm events. Typically, the Department of Transportation for each state has developed standard requirements for maintaining vegetation along roadways. These standards should be followed since soil types, vegetation and weather conditions vary for each state. However, in the event that a state maintenance program does not exist, the following eight (8) areas have been identified as important when it comes to the Enkamat TRM maintenance program. These include Initial Installation, Vegetation Establishment (and Density), Fertilization, Monitoring Channel Performance, Mowing, Inlet/Outlet Structures, Positive Drainage in Channel and Sediment Accumulation within Channel.

### 1.0 Initial Installation

The initial installation is of primary importance for the success of the Enkamat to meet the performance objective - to minimize erosion and protect the vegetation once established. If the Enkamat is installed incorrectly initially, then the actual performance of the Enkamat will likely be substandard. The critical part of the installation is to ensure that the Enkamat is always in direct contact with the soil, so that the interaction between the Enkamat, soil and root structure of the vegetation will take place. Another key part of the installation, which is actually a design issue, is to choosing vegetation that is common to the area. Blending some type of annual grass or grasses that germinate quickly (like Rye Grass but will only last the first growing season) can be considered. This will aid the desired perennial grasses in establishing itself (hardy grasses typically take a longer time to germinate).

### 2.0 Vegetation Establishment

The second most important part is to establish the vegetation in order to achieve maximum performance of the Enkamat. The three parts for seed germination and establishment of vegetation include temperature, moisture and soil makeup (pH, Potassium, Nitrogen, Phosphate). Obviously temperature can not be controlled. However, seeding is performed typically in the spring or fall to reduce the possibility of extreme hot or cold weather during the germination phase. Moisture can be controlled by adequately watering. Within the first two weeks after seeding, typically water needs to be applied to enhance seed germination

and develop healthy vegetation. Periodic water application after that may be required depending on the weather. An important point to remember is to ensure adequate soil moisture for optimum germination and vegetation growth.

On the contrary, avoid over-watering (soils becoming overly saturated). The water applied should be sprayed and not jetted (stream flow) to prevent any artificial catalyst of erosion. It has been recommended that the density (or coverage) of the vegetation should be at least 50% established within the first six (6) months and 90% after 1 year. If the adequate density is not established then over seeding should take place to ensure the proper density of 90% is achieved. [An appropriate seed mixture should be required by a qualified agent of the soil conservation district.]

### 3.0 Monitoring Channel Performance

A qualified inspector should perform periodic monitoring for the first two years. This should particularly be done after storm events to check for erosion, scour, debris or any significant sediment accumulations. If erosion or scour has occurred, it is recommended that the trouble area be reworked by re-placing the soil and re-seeding. Debris and any significant sediment accumulations should be removed to reduce restriction to vegetation growth. The channel side-slopes should also be reviewed to ensure proper slope stability. The monitoring program should also identify the condition of the vegetation growth and density, as well as, signs of stress caused by weather conditions or flow events.

### 4.0 Mowing

Mowing is important in establishing and maintaining a good vegetated cover. When the upper portion of the vegetation is removed, the plant produces more sugars and begins storing more starches in the root. This results in more plant growth and in essence, you achieve a knitting affect of the vegetation into the soil and the Enkamat which in return, inhibits erosion, retains soil moisture, reduces heat stress and controls broadleaf infestation. This results in overall healthy vegetation and increases the aesthetics of the area. In general, mowing should be done at least twice a year and perhaps more depending on the type of vegetation selected. A minimum cut height of 6" is recommended. Mowing should be done when the ground is dry to minimize rutting that might be caused by heavy maintenance equipment in otherwise wet channels.

## 5.0 Fertilization

Many soils require additional fertilizer to enhance establishment of vegetation. Supplemental applications might be required yearly, based on soil conditions and vegetation growth, to increase and maintain the strength of established vegetation. Ensure that fertilizer is applied at recommended rate and does not burn the existing vegetation.

## 6.0 Sediment Accumulation

Excessive sediment accumulation within the channel should be removed to assure positive drainage within the channel and to avoid over-stressing of the vegetation. Typically, sediment will accumulate within the riprap area because of the flow conditions at these points. This sediment is commonly transported through storm drains from off site runoff flowing into the channel. Some amount of sediment can be expected however excessive quantities should be a sign avoided and rectified in a timely manner.

## 7.0 Inlet or Outlet Structures

The monitoring program should also consist of evaluating the inlet and outlet structures within the drainage channel. Since these areas typically exhibit turbulent flows, they are more likely to erode. You should check to see that the geotextile placed under the riprap is not damaged and remains intact. The transition between the riprap and grass-lined channel should exhibit no signs of erosion or undermining of the Enkamat. If this is the case, then the riprap spillway should be extended or replaced with soil and seed to provide the appropriate transition.

## 8.0 Positive Drainage

Positive drainage (unrestricted flow due to sediment accumulation or other obstructions) should be maintained to ensure that sustained water accumulation is not occurring on the bottom of the channel. If standing water does occur, the area should be reworked and re-seeded. If standing water is expected or desired, typically wetland plants can endure prolonged submersion. These species are good under water but conversely these types of plants cannot usually resist high flow velocities or shear strength.

# EnkaTech *Note*

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For more information regarding design, installation or maintenance of Enkamat TRM systems or information about any of our products please contact Colbond Geosynthetics at 1-800-365-7391.

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