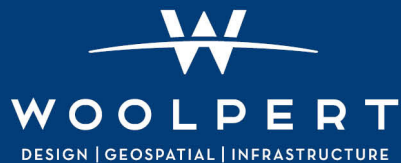


STABILIZATION SPECIFICATION  
&  
BIORETENTION NATIVE PLANT  
SPECIFICATION



CITY OF GREER, SOUTH CAROLINA

December 3, 2012



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# CITY OF GREER STABILIZATION SPECIFICATION

## 1.0 STABILIZATION INTRODUCTION

This *Stabilization Specification* is developed to improve the success of seeding/stabilization efforts in the Upstate of South Carolina. It includes appropriate seed mixes and application rates for different seeding locations/applications and the appropriate planting dates. Following the recommendations of this *Specification* should reduce the number of times a site has to be re-seeded and the time it takes to achieve acceptable temporary and permanent stabilization. This *Specification* also includes recommendations for proper lime, fertilizer, biological growth stimulant, and soil amendment use to achieve site stabilization.

## 1.1 TEMPORARY STABILIZATION

Temporary Stabilization is defined as a condition where exposed soils or disturbed areas are provided a temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

### 1.1.1 Initiating Temporary Stabilization

Initiate temporary stabilization by mulch or temporary stabilization by seeding within 7 calendar days where land disturbing activities have temporarily ceased on the Project and will not resume for a period exceeding 14 calendar days. Where land disturbing activities on a portion of the Project are temporarily ceased, and the land disturbing activities are resumed within 14 days, temporary stabilization measures are not required to be initiated on that portion of the Project.

Temporary stabilization by seeding is required if the Project will not be worked for a period longer than 60 days.

Initiate temporary stabilization measures as soon as practicable for areas where initiating temporary stabilization measures within 7 days is infeasible (e.g., where snow cover, frozen ground, or drought conditions preclude stabilization).

Do not use temporary stabilization by seeding when the ground is frozen and/or when the 10-day forecasted low temperature remains below 35 degrees Fahrenheit.

### 1.1.2 Acceptance of Temporary Stabilization

Before acceptance of temporary stabilization by the *regulatory agency* and the *Design Engineer or Landscape Architect*, temporary stabilization is required that is sufficient to control erosion for a given area and length of time before the next phase of construction or the establishment of permanent seeding is to commence. A satisfactory stand of temporary stabilization meeting the requirements of this *Specification* is required regardless of the time of the year the work is performed.

## 1.2 FINAL STABILIZATION

Final Stabilization is defined that all land-disturbing activities at the construction site have been completed and that on all areas not covered by permanent structures, either

- (1) A uniform (e.g., evenly distributed, without large bare areas) permanent vegetative cover with a density of 70 percent has been established, or
- (2) Equivalent permanent stabilization measures (such as the use of landscaping mulch, riprap, pavement, and gravel) have been implemented to provide effective cover for exposed portions of the construction site not stabilized with permanent vegetation.

Final stabilization by vegetation must be achieved with permanent perennial vegetation prior to issuing the Notice of Termination (NOT).

#### 1.2.1 Permanent Seeding

Initiate permanent seeding within 7 calendar days where land disturbing activities have permanently ceased on the Project. Where land disturbing activities are resumed within 14 days, stabilization measures are not required to be initiated on that portion of the Project. Initiate permanent seeding measures as soon as practicable for areas where initiating permanent seeding measures within 7 days is infeasible (e.g., where snow cover, frozen ground, or drought conditions preclude stabilization).

When performing permanent seeding for permanent detention ponds, ensure that the detention pond is cleaned of any deposited sediment and graded to the required permanent detention basin configuration. Ensure the seedbed for the permanent seeding is established in accordance with this *Specification*.

#### 1.2.2 Acceptance of Permanent Seeding

Before acceptance of permanent seeding by the *regulatory agency* and the *Design Engineer or Landscape Architect*, a uniform permanent perennial vegetative cover with a density of 70% of each square yard of the seeded area is required. A well-developed root system must be established to sufficiently survive dry periods and winter weather and be capable of reestablishment in the spring.

### **1.3 Sod**

Initiate Sod applications within 7 calendar days where land disturbing activities have permanently ceased on the Project. Initiate Sod applications measures as soon as practicable for areas where initiating Sod applications within 7 days is infeasible (e.g., where snow cover, frozen ground, or drought conditions preclude stabilization). Use Sod on slopes less than 2H:1V.

#### 1.3.1 Acceptance of Sod

The *Design Engineer or Landscape Architect* will inspect Sod applications for acceptance. Acceptance is contingent on establishing a satisfactory stand of perennial grass. Sod application areas are acceptable when all requirements including maintenance are met and a healthy, evenly colored, viable stand of grass is established. A satisfactory stand of grass must have a root system that is sufficient to survive dry periods and winter weather and is capable of re-establishing in the spring.

## 2.0 SEED

### 2.1 SEED SCHEDULE

The *Design Engineer or Landscape Architect* will select a seeding plan utilizing the seeding schedules included in Appendix A or B for all temporary cover by seeding and permanent seeding applications.

### 2.2 SIMPLIFIED SEEDING SCHEDULE

The *Design Engineer or Landscape Architect* will use the exact Simplified Seeding Schedule as listed in Appendix A for the specific seeding application/location and applicable planting date. Non Slope Areas are defined as areas flatter than a 4H:1V or areas with a grade less than 25%.

### 2.3. DETAILED SEEDING SCHEDULE

The *Design Engineer or Landscape Architect* will use the Detailed Seeding Schedule as listed in Appendix B for the specific seeding application/location and applicable planting date.

#### 2.3.1 Non Slope Areas (areas flatter than a 4H:1V / areas with a grade less than 25%)

In accordance with Appendix B, specify a minimum of two (2) perennial seed types for all permanent seeding for Non Slope Areas based on the specific application and the availability of the seed. A minimum of one (1) of the seed types specified must be a turf-type species. When specifying two (2) perennial seed types, specify the primary turf type species at the recommended rate shown and the additional perennial seed may be specified at a rate less than the recommended rate shown.

The *Design Engineer or Landscape Architect* must also specify a minimum of one (1) acceptable annual nurse crop species, or a mix of two (2) or more annual nurse crops species with one species specified at a minimum Nurse Crop rate of approximately 75% of the recommended rate shown and the other species specified at a Nurse Crop rate that does not exceed approximately 50% of the recommended rate shown.

In accordance with Appendix B, specify a minimum of one (1) annual seed type for all temporary cover by seeding for Non Slope Areas based on the specific application and the availability of the seed. Specify the annual seed type at the Temporary Cover rate shown.

#### 2.3.2 Slopes

In accordance with Appendix B, specify a minimum of three (3) perennial seed types for all permanent seeding for Slope Areas based on the specific application and the availability of the seed. A minimum of one (1) of the seed types specified must be a turf-type species. When utilizing three (3) perennial seed types, specify the primary turf type species at the recommended rate shown and specify the additional perennial seeds at a rate less than the recommended rate shown.

The *Design Engineer or Landscape Architect* must also specify a minimum of one (1) acceptable annual nurse crop species, or a mix of two (2) or more annual nurse crops species with one species specified at a minimum rate of approximately 75% of the recommended rate shown and the other species specified at a rate that does not exceed approximately 50% of the recommended rate shown.

In accordance with Appendix B, specify a minimum of two (2) annual seed type for all temporary cover by seeding for Slope Areas based on the specific application and the availability of the seed.

### 2.3.3 Road Medians / Shoulders and Non Slope Utility Applications

In accordance with Appendix B, specify a minimum of one (1) perennial turf-type species and one (1) acceptable annual nurse crop species for road medians, road shoulders and Non Slope Utility applications. If a mix of two (2) or more annual nurse crops species is selected, specify one species at a minimum rate of approximately 75% of the recommended rate shown and specify the other species at a rate that does not exceed approximately 50% of the recommended rate shown.

## **2.4 SEED**

Use seed that conforms to all state laws and all requirements and regulations of the South Carolina Department of Agriculture (SCDA). Seeds containing species designated by the State Crop Pest Commission as a plant pest (i.e., noxious weeds) are not permitted. Use seed that is individually packaged or bagged and tagged. Each tag must clearly state:

- Net weight
- Botanical name
- Common name
- Variety
- Grower name
- Grower lot number
- Percent purity
- Percent germination
- Percent other crop seed
- Percent inert matter
- Percent weed seed (if weed seed is present, provide a list of species by botanical name)
- Origin

When mixtures of different types of seed are called for in the seeding schedule, pre-blended mixtures that are individually packaged or bagged and tagged with the tag specifying the botanical and common name of each species contained in the blend, and the percentages of each species are preferred.

When pre-blended seed mixtures are not used, each species is weighed and mixed in the proper proportions on-site in the presence of the *Design Engineer or Landscape Architect* to verify the application.

When purchasing seed, it is important to observe the expiration date to avoid buying more than can be used before seed expiration.

## 3.0 SEEDING AMENDMENTS

The soil pH value is a measure of soil acidity or alkalinity. Soil pH directly affects nutrient availability to the grass. The pH scale ranges from 0 to 14, with 7 as neutral. Numbers less than 7 indicate acidity while numbers greater than 7 indicate alkalinity.

The soil pH value directly affects nutrient availability to grasses and grass tends to grow best in slightly acidic soils (pH 5.8 to 6.5). Soil pH values above or below this range may result in less vigorous growth and nutrient deficiencies.

Nutrients for healthy grass growth are divided into three categories: primary, secondary and micronutrients. Nitrogen (N), phosphorus (P) and potassium (K) are primary nutrients which are needed in fairly large quantities compared to the other plant nutrients. Calcium (Ca), magnesium (Mg) and sulfur (S) are secondary nutrients which are required by the plant in lesser quantities but are no less essential for good plant growth than the primary nutrients. Zinc (Zn) and manganese (Mn) are micronutrients, which are required by the plant in very small amounts. Most secondary and micronutrient deficiencies are easily corrected by keeping the soil at the optimum pH value.

The major impact that extremes in pH have on plant growth is related to the availability of plant nutrients or the soil concentration of plant-toxic minerals. In highly acid soils, aluminum and manganese can become more available and more toxic to the plant. At low pH values, calcium, phosphorus and magnesium are less available to the plant. At pH values of 6.5 and above, phosphorus and most of the micronutrients become less available.

Reaching and maintaining a proper pH level is the most important step in establishing and maintaining a healthy stand of grass.

### 3.1 LIME

#### 3.1.1 Agricultural Granular Lime

Use solid agricultural granular lime for all permanent seeding applications and Sodding applications that is agricultural grade, standard ground limestone. Ensure that each bag has a tag or label, or in the case of bulk sales, a delivery slip showing brand or trade name, calcium carbonate equivalent, percent by weight passing prescribed U. S. Standard Sieves, and other pertinent information to identify lime as being agricultural grade, standard ground limestone.

#### 3.1.2 Applying Granular Lime

A soil analysis is recommended prior to agricultural granular lime applications. The soil analysis determines the need and rate of granular lime application for a given application area.

Following advance seedbed preparation, uniformly spread solid agricultural granular lime over the designated areas. Solid agricultural granular lime may be applied by approved mechanical spreaders or by hydraulic methods as a mixture of lime and seed. Thoroughly mix agricultural granular lime with the soil to a depth of approximately two (2) inches. Mixing is not required when spreading lime with hydraulic methods.

Apply all agricultural granular lime at a rate that is within  $\pm 10\%$  of the weight recommendation of the soil analysis. Do not apply more than 2,500 lbs/acre of agricultural lime in a single application.

Agricultural granular lime is not required for temporary seeding applications unless a soil analysis is requested by the regulatory agency and indicates a pH below 5.0.



### 3.1.3 Fast Acting Lime

Use fast acting liquid forms and/or dry forms of lime for all temporary seeding and permanent seeding applications that meet all of the requirements of agricultural grade granular lime specified herein, except percent by weight passing U.S. Standard Sieves.

### 3.1.4 Applying Fast Acting Lime

Fast acting liquid and dry lime provides an immediate pH adjustment. Apply fast acting liquid lime at a rate of 5 gallons per acre or per the manufacturer's recommendations. Apply fast acting dry lime at a rate of 100 pounds per acre or per the manufacturer's recommendations. Fast acting lime may be applied by approved mechanical spreaders or by hydraulic methods as a mixture with the seed.

## **3.2 FERTILIZER**

### 3.2.1 Granular Fertilizer

Use granular fertilizer for all permanent seeding applications and all Sodding applications. The proper fertilizer mixture is dependent on the existing soil conditions and it is recommended that a soil analysis be performed if the soil conditions are uncertain in the area of fertilizer application.

In a mixed fertilizer such as 10-10-10, the first number represents the percent of nitrogen required, the second number represents the percent of phosphorus, and the third number represents the percent of water soluble potassium in the fertilizer. **Use fertilizer that incorporates a minimum of 50% water insoluble (slow release) nitrogen. Animal by-product or municipal waste fertilizers are not acceptable under this *Specification*.**

Unless a soil analysis is performed to determine otherwise, a good rule of thumb granular fertilizer to apply in the Upstate of South Carolina is 10-10-10. In no case should a 20-20-20 fertilizer be used due to the potential burning of the seedbed.

### 3.2.2 Applying Granular Fertilizer

Fertilizer may be applied by approved mechanical spreaders or by hydraulic methods as a mixture of fertilizer and seed. When fertilizer is applied with combination seed and fertilizer drills, no further incorporation is necessary. Apply the fertilizer and seed together when hydraulic methods of seeding are used.

Apply all fertilizer at a rate that is within  $\pm 10\%$  of the weight recommendation of the soil analysis. Apply fertilizer that is within  $\pm 2$  percentage points of the recommendation of the soil analysis.

The required application of nitrogen includes a minimum of 50% water insoluble (slow release) nitrogen under this *Specification*.

## **3.3 COMPOST SOIL AMENDMENT**

For seedbeds that have little or no topsoil, are highly acidic, or are lacking sufficient nutrients to sustain a health stand of grass, furnish, place, and mix certified weed free compost to a minimum depth of 3 inches into the seedbed in order to ensure a good stand of grass. Provide compost when seedbeds are excessively nutrient deficient to the extent of requiring costly fertilizer additions and or have excessively low pH values (lower than 5.0) based on the results of a soil test. Compost requirements are described in Section 4.3.

### 3.4 BIOLOGICAL GROWTH STIMULANTS

Provide biological growth stimulants for all permanent seeding, Sodding, and temporary seeding applications. Use biological growth stimulants that provide an immediate seedbed adjustment to help stimulate seed germination, improve the availability of nutrients to the grass, increase the number and depth of root development, and generate robust plant growth which is more tolerant of changes in environmental conditions.

Use biological growth stimulants that:

- Contain components to improve nutrient and water uptake by the plant,
- Contain plant growth hormones which act as a stimulant to improve vegetative growth and intake of micro nutrients and can reduce damage from disease and insect infestation, and
- Contain components that increases biological activity in the soil to improve stress tolerance/drought resistance, reduces sodium uptake in sandy soils, provides more phosphorus availability, and increases cation exchange capacity resulting in earlier germination and better root establishment.

Provide biological growth stimulants that contain compounds such as:

- Humic acid (humates),
- Humectants,
- Cold water processed seaweed/kelp extract,
- Beneficial microbes,
- Cytokinins,
- Gibberellins,
- Auxins (growth hormones), and
- Endo-mycorrhizae.

Animal by-products or municipal waste products are **not** acceptable biological growth stimulants under this *Specification*. Liquid fertilizers are not acceptable as biological growth stimulants under this *Specification*.

Provide biological growth stimulants composed of non-toxic materials.

Provide Biological Growth Stimulants that have no germination or growth inhibiting factors and do not form a water-resistant crust that can inhibit plant growth. Furnish biological growth stimulants where all components are pre-packaged by the manufacturer to assure material performance and compliance with the minimum requirements in Table 1.

**Table 1: Minimum Biological Growth Stimulant Requirements**

| BGS Property       | Test Method                                     | Required Value |
|--------------------|---|----------------|
| <b>Physical</b>    |   |                |
| Acute Toxicity     | ASTM 7101<br>EPA Method 2021 or EPA Method 2002 | Non Toxic      |
| <b>Performance</b> |   |                |
| Seed Germination   | ASTM D7322 <sup>1</sup>                         | 200% minimum   |
| Plant Height       | ASTM D7322 <sup>1</sup>                         | 200% minimum   |
| Plant Mass         | ASTM D7322 <sup>1</sup>                         | 110% minimum   |

<sup>1</sup> ASTM test methods developed for Rolled Erosion Control Products (RECPs) that have been modified for comparison to control between 14 and 21 days.

### 3.4.1 Applying Biological Growth Stimulants

When using biological growth stimulants, it is important to strictly follow the manufacturer's recommendations to avoid damage or burning of the seedbed. Use approved hydraulic methods to apply biological growth stimulants.

***Liquid fertilizer is not a biological growth stimulant and can cause burning of the seedbed if applied as such.***

## 4.0 EROSION PREVENTION PRACTICES

### 4.1 MULCH

Mulch is required for all permanent seeding, temporary seeding, and temporary cover applications except for road shoulder work that has a disturbed width less than six (6) feet and where seeding is compacted using a culti-packer or light roller. Compaction is not necessary if seeds are planted by mechanical seed drills that perform a compaction procedure.

Only use mulch that is certified weed free. *Wood chip mulch is not acceptable for seeding applications.*

Do not use Mulch in areas where concentrated flow is expected.

Use Mulch for temporary seeding and temporary cover applications when the application area will require additional grading prior to permanent seeding. Do not use Erosion Control Blankets (ECB) or Turf Reinforcement Matting (TRM) in this situation.

Apply mulch according to Table 2.

**TABLE 2: MULCH APPLICATIONS**

| Mulch                       | Applicable Slopes (H:V) <sup>1</sup> | Minimum Application Rate (lbs/acre -dry) <sup>2</sup> |
|-----------------------------|--------------------------------------|---|
| Wood Chip                   | ≤ 4:1                                | 500 CY/acre   |
| Straw or Hay with Tackifier | ≤ 4:1                                | 2,000   |
| HECP Type 1                 | ≤ 4:1                                | 2,000   |
| HECP Type 2                 | 4:1 < S ≤ 3:1                        | 2,500   |
| HECP Type 3                 | 3:1 < S ≤ 2:1                        | 3,000   |
| HECP Type 4                 | 2:1 < S ≤ 1:1                        | 3,500   |
|                             | > 1:1                                | 4,000 (temp cover only) <sup>3</sup>                  |
| Compost Mulch               | ≤ 2:1                                | 200 CY/acre   |

- 1 The maximum allowable continuous slope length for all mulch applications is 50 feet. Slope interruption devices or TRMs are required for continuous slope length longer than 50 feet.
- 2 Strictly comply with the manufacturer's mixing recommendations for the actual slope steepness and the actual continuous slope length of the application.
- 3 HECP Type 4 may be used for permanent cover applications on slopes 1:1 or greater at a minimum rate of 4,500 pounds per acre.

## 4.2 WOOD CHIPS

*Wood chip mulch is **not** acceptable for seeding applications.* Apply wood chips to a minimum depth of 3 to 4 inches using a blower, chop handler, or by hand. If wood chip mulch is used for temporary cover by mulch, it must be removed prior to performing permanent seeding.

## 4.2 STRAW OR HAY MULCH WITH TACKIFIER

Use straw or hay mulch material that consists of certified weed free straw or hay. Use straw that consists of stalks of wheat, rye, barley, oats, or other approved straw. Use hay that consists of Timothy, Peavine, Alfalfa, Coastal Bermuda, or other grasses from approved sources. Use materials that are reasonably dry and reasonably free from mature seed-bearing stalks, roots, or bulblets of Johnson grass, Nutgrass, Sandburg, Wild Garlic, Wild Onion, Wild Mustard, Crotonaria, Pigweed, Witchweed, and Cocklebur. Comply with all state and federal domestic plant quarantine regulations. Do not use Straw Mulch in areas adjacent to sidewalks, guardrails, curbs, curb and gutters, or concrete medians. Do not use straw or hay mulch with tackifiers for permanent seeding or temporary cover applications on slopes steeper than 4H:1V. Anchor straw mulch material using one of the following tacking agents:

### 4.2.1 Organic or Chemical Tackifier

These tackifiers consist of guar gum, plantago, polysaccharides, polymer synthetic resin, polypectate or other material that will give adhesive properties when sprayed on straw mulches. Applications should be heavier at edges, in valleys, and at crests of banks and other areas where the straw mulch may be moved by wind or water. All other areas must have a uniform application of the tackifier. Apply tackifiers at the manufacturer's recommended rate.

### 4.2.2 Hydraulic Straw Tackifiers

Apply hydraulic erosion control tackifiers at the manufacturer's recommended rate for straw binding.

### 4.2.3 Emulsified Asphalt

Dilute Emulsified Asphalt at the manufacturing plant with an equal amount of water and uniformly apply it over the straw mulch material as a film. Apply the film at approximately 0.20 gallon of dilution per square yard to sufficiently bond together the straw mulch and prevent wind erosion without creating a heavy coating of asphalt material.

Emulsified Asphalt is **not** applicable for use in urban areas or along sidewalks, curb and gutters, bridges, and water bodies.

### 4.2.4 Applying Straw or Hay Mulch

Uniformly apply straw or hay mulch material at the rate of 2,000 pounds per acre. Straw mulch may be spread either by hand, by appropriate mechanical spreaders, or by blowers. Apply straw mulch to allow sunlight penetration, air circulation, partial shading of the ground, and conservation of soil moisture. Secure newly laid straw mulch with an approved tackifier. Replace all straw mulch displaced during the tackifier application process.

### 4.3 COMPOST MULCH

Compost is the product resulting from the controlled biological decomposition of organic material occurring under aerobic conditions that has been sanitized through the generation of heat and stabilized to the point that it is appropriate for its particular application. Ensure compost possesses no objectionable odors or substances toxic to plants and does not resemble the raw material from which it was derived. Provide compost only from a compost producer that participates in the United States Composting Council's (USCC) Seal of Testing Assurance (STA) program.

Compost mulch may include, but is not limited to, the following:

- Leaf and yard trimmings
- Food scraps
- Treated biosolids
- Manure
- Agricultural residuals
- Forest residuals
- Tree wood
- Bark
- Paper

Ensure compost does not contain any visible refuse, other physical contaminants, or any substance considered harmful to plant growth. Do not use materials that have been treated with chemical preservatives as compost mulch. ***Do not use mixed municipal solid waste compost.***

#### 4.3.1 Applying Compost Mulch

Avoid very coarse compost with particles larger than 3 inches if the application is seeded, as it will make vegetation establishment more difficult.

Ensure that the areas to receive compost are uniform and conform to the finished grade and cross-section shown on the Plans. Slightly roughen (scarify) slopes and remove large clods, rocks, stumps, roots larger than two (2) inches in diameter and debris on slopes where vegetation is to be established. Where it is practical, track (compact) perpendicular to contours on the slope using a bulldozer before applying the compost.

Place no more than a two (2) inch depth and no less than a one (1) inch depth of compost for areas that will receive seeding, planting, or landscaping as shown on the Plans. Modify compost application rates based on specific site conditions including soil characteristics, severity of slope grade, and slope length.

Uniformly apply compost using an approved spreader unit, including bulldozers, side discharge manure spreaders, etc. Alternatively, apply compost using a pneumatic (blower) unit or other unit that propels the product directly at the soil surface, thereby preventing water from moving between the soil-compost interface. Where applicable, apply the compost layer a minimum of three (3) feet over the top of the slope.

On highly unstable soils, use compost in conjunction with appropriate structural measures.

Incorporate seed directly with the compost when using a pneumatic unit. Apply the seed and compost mixture using a pneumatic blower device equipped with a calibrated seed injection system capable of uniformly and simultaneously applying compost and seed. Ensure the pneumatic blower is properly calibrated to provide the specified amounts of seed from the seeding plan. An alternative seeding

application includes blending seed into the compost evenly prior to pneumatic compost application.

When not incorporating seed directly into the compost, perform temporary cover by seeding or permanent cover using hydraulic methods for seed application utilizing a HEC Type 1 as a tracer at a minimum rate of 1000 pounds/acre.

#### 4.4 HYDRAULIC EROSION CONTROL PRODUCTS (HECPs)

Use Hydraulic Erosion Control Product (HECPs) as an allowable mulch for temporary cover by mulch, temporary cover by seeding or permanent cover by seeding applications as outlined in this *Specification*. Do not use HECs as a channel liner or for areas receiving concentrated flow. Refer to *SCDOT Supplemental Technical Specification for HEC (SC-M-815-11)* or latest revision for HEC description, materials, and construction requirements.

#### 4.5 TEMPORARY EROSION CONTROL BLANKET (ECB) AND TURF REINFORCEMENT MATTING (TRM)

Consider the use of Temporary Erosion Control Blankets (ECB) and/or Turf Reinforcement Matting (TRM) for permanent seeding application areas with steep slopes or areas where there is a significant erosion problem or potential for erosion. Use ECB and TRM in areas where concentrated flow is expected.

Do not use ECB and TRM for temporary seeding applications when the application areas will require additional grading or modifications prior to permanent seeding.

Utilize Table 3 to determine appropriate applications of ECB and TRM.

**TABLE 3: ECB and TRM APPLICATIONS**

| ECB/TRM Type <sup>1</sup>   | Slope (H:V) <sup>2</sup> | Minimum Slope Length (ft) |
|-----------------------------|--------------------------|---------------------------|
| Temporary ECB or Type 1 TRM | ≤ 2:1                    | 5                         |
| Type 2 TRM                  | ≤ 1.5:1                  | 5                         |
| Type 3 TRM                  | ≤ 1:1                    | 5                         |

1 Strictly comply with the manufacturer’s specifications.

2 The maximum allowable continuous slope length for ECBs is 50 feet. Slope interruption devices or TRMs are required for continuous slope length longer than 50 feet.

Refer to *SCDOT Supplemental Technical Specification for Rolled Erosion Control Products (RECP) (SC-M-815-9)* or latest revision for Temporary Erosion Control Blanket (ECB) and Turf Reinforcement Matting (TRM) description, materials, and construction requirements.

##### 4.5.1 Installing ECB and TRM

It is very important to refer to the manufacturer’s specifications when installing ECB or TRM. Pay close attention to specific product descriptions, materials and installation requirements. In addition, it is recommended that the City Engineer be involved when ECBs or TRMs are installed to aid in the selection process as well as the performance evaluation.

## 4.6 SLOPE INTERRUPTION DEVICES

The maximum allowable continuous slope length for straw or hay mulch, HECPs, compost and ECB applications is 50 feet. Slope interruption devices or TRM are required for continuous slope length longer than 50 feet.

### 4.6.1 Slope Interruption Device Materials

Use non-weighted sediment tubes as slope interruption devices for erosion prevention on slopes greater than 50 feet in length for HECF and Temporary Erosion Control Blanket slope applications. Do not use straw bales, natural pine needles, leaf mulch, and or grass clippings.

Provide slope interruption devices that exhibit the following properties:

- Machine produced by a manufacturer experienced in sediment tube manufacturing.
- Materials are certified 100% weed free.
- When curled excelsior wood fiber is used, 80% of the fiber materials are a minimum of four (4) inches in length.
- When washed shredded recycled rubber particles are used, a minimum of 98% of metal is removed.
- Materials are enclosed by a tubular, flexible outer netting treated with ultraviolet stabilizers.

Do not use straw, curled excelsior wood, or natural coconut rolled erosion control products (RECPs) that are rolled up to create a slope interruption device.

Provide stakes or other means to stabilize non-weighted slope interruption devices to keep them safely in place. Provide a slope interruption device that meets the minimum performance requirements shown in the Table 4.

**TABLE 4: SLOPE INTERRUPTION DEVICE MATERIAL SPECIFICATIONS**

| Property  | Test Method <sup>1</sup>    | Value   |
|---|-----------------------------|---|
| Pre-installed Diameter  | Field Measured              | 6.0 inch to 12.0 inch                                       |
| Mass per Unit Length  | Field Measured              | 6 inch = 1.0 lbs/ft minimum<br>12 inch = 2.0 lbs/ft minimum |
| Length per Tube   | Field Measured              | 6 foot minimum  |
| Filtering Efficiency Performance                                  | ASTM D5141 or<br>ASTM D7351 | 80% Total Suspended Solids<br>(TSS)                         |
| Clean Water Flow Rate   | ASTM D4491 or Equivalent    | 100 gal/min/ft <sup>2</sup> minimum                         |
| Netting Ultraviolet Stability<br>(retained strength after 500 hr) | ASTM D4355                  | 70%   |

### 4.6.2 Slope Interruption Device Installation

Install slope interruption devices for Hydraulic Erosion Control Products (HECPs) applications prior to the HECP installation. Excavate a trench along (parallel) the contour of the slope to a depth that is 1/3 the tube diameter. Place the excavated soil on the up-slope side of the trench. Place the slope interruption device into the trench so it contours to the soil surface, ensuring no gaps exists



underneath the tube. Compact the excavated soil against the tube on the up-slope side. Ensure the installation of the slope interruption device does not damage the prepared seedbed.

Install non-weighted slope interruption devices for Temporary Erosion Control Blankets (ECB) application after the ECB installation on top of the ECB. Tube trenching is not required for ECB applications. Ensure the installation of the slope interruption device does not damage the installed ECB.

Install non-weighted slope interruption devices using wooden stakes with a minimum length of 3 feet with a minimum measured dimension of 3/4 inch x 3/4 inch and a maximum measured dimension of 1 inch x 1 inch. Do not use steel posts for this application. Install a stake at each end of each tube and space stakes on maximum 4 foot centers. Drive stakes into the ground perpendicular to the slope to a depth of 2 feet or to the maximum extent practicable.

Install the stakes through the center of the non-weighted slope interruption device. Abut adjacent tubes tightly, end to end, without overlapping the ends. Tie the tube ends together using heavy twine or plastic locking ties. Dogleg terminal ends of slope interruption devices up slope to ensure containment and the prevention of channeling of runoff.

Ensure the areas for post installation are compacted so the posts are properly installed.

## 5.0 SEEDING CONSTRUCTION REQUIREMENTS

### 5.1 SEEDING DATES AND RATES OF APPLICATION

Perform seeding work during the periods and at the rates specified in the seeding tables located in Appendix A and B of this *Specification*. Do not use temporary cover by seeding or permanent seeding for projects when:

- The ground is frozen and/or when the 10-day forecasted low temperature remains below 35 degrees Fahrenheit;
- The ground is excessively wet; or
- The ground is excessively dry (periods of drought) unless watering is specified.

During periods of adverse conditions, use temporary cover by mulch.

### 5.2 SEEDBED PREPARATION

- Ensure that the areas receiving permanent seeding are uniform and conform to the finished grade of the Project.
- Perform minor shaping and evening of uneven and rough areas outside of the graded area in order to provide for more effective erosion control and for ease of subsequent mowing operations.
- Loosen the seedbed (including cut slopes) to a minimum depth of three (3) inches before initiating permanent seeding and temporary seeding.
- An acceptable method of preparing the seedbed on slopes is vertically tracking the seedbed up and down the slope with proper equipment.
- Remove stones larger than two and one-half (2½) inches in any dimension, large dirt clods, roots, or other debris brought to the surface.
- Use compost if good seedbed material is not located on site or results of the soil test show the seedbed is excessively nutrient deficient to the extent of requiring costly fertilizer additions and or have excessively low pH values (lower than 5.0).
- Consider the use of mechanical seed drills to perform permanent seeding on areas where temporary seeding or temporary cover by mulch was previously utilized.

### 5.3 TEMPORARY COVER BY MULCH

Use temporary cover by mulch where it is not feasible or practicable to bring an area to final slope and grade. Use temporary cover by mulch on isolated problem areas. Finish the surface so that permanent seeding can be performed without subsequent disturbance by additional grading.

### 5.4 TEMPORARY COVER BY SEEDING

Following the preparation of the seedbed according to this *Specification*, sow seed prior to a rainfall event that compacts the seedbed. Use the seed specified in the seeding tables in Appendix A and B of this *Specification* and as shown on the Plans.

Uniformly sow seed at the rate specified by the use of approved mechanical seed drills, rotary hand seeders, hydraulic equipment, or any other type of equipment that produces a uniform seed application.

After sowing temporary seed, apply an appropriate mulch as listed in this *Specification* prior to a rainfall event that compacts the seedbed. On small areas inaccessible to machinery, temporary seed may be covered by hand rakes or other methods satisfactory to the *Design Engineer or Landscape Architect*. The *CONTRACTOR* may add granular lime and fertilizer as necessary to enhance growth.

Temporary cover by seeding may be used in isolated problem areas or where it is not feasible or practicable to bring an area to final slope and grade. Finish the surface so that permanent cover can be performed without subsequent disturbance by additional grading.

## **5.5 PERMANENT SEEDING**

Following the preparation of the seedbed according to this *Specification*, perform permanent seeding within 5 working days and/or prior to a rainfall event that compacts the prepared seedbed. If a rain event occurs that compacts or erodes the seedbed prior to performing permanent seeding, the seedbed must be re-prepared prior to conducting permanent seeding.

Use the seed specified in the seeding tables in Appendix A and B of this *Specification* and as shown on the Plans to produce the required stand of grass and follow the application procedures of this *Specification*. Uniformly sow seed at the rate specified by the use of approved mechanical seed drills, rotary hand seeders, hydraulic equipment, or any other type of equipment that produces a uniform seed application.

After sowing permanent seed, apply an appropriate mulch as listed in this *Specification* within 5 working days and/or prior to a rainfall event that compacts the prepared seedbed. On small areas inaccessible to machinery, the seed may be covered by hand rakes or other methods satisfactory to the *Design Engineer or Landscape Architect*. Add fertilizer and lime as required by a soil test.

## **5.6 PROTECTION OF STRUCTURES**

Cover any parts of bridges, culverts, guardrails, signs, sidewalks, curb and gutters, catch basins, pipe ends, and other structures as necessary to prevent discoloration before spraying organic or chemical tackifiers.

## 6.0 SOD

Sod is appropriate for any graded or cleared area that may erode, and where a permanent cover is immediately needed. Examples of sodding applications include yards, buffer zones, streambanks, dikes, swales, slopes, outlets, level spreaders and filter strips. Do not use sodding on slopes steeper than 2H:1V, and if sodding is mowed, do not place it slopes greater than 3H:1V.

### 6.1 SOD APPLICATION DATES

Install Warm Season Sod between March 1st and September 1st. Install Cool Season Sod anytime during the year as long as the soil is not frozen.

Lay Sod on the prepared Sod Bed within 24 hours after cutting, except that Sod may be stored in stacks or piles, grass to grass and roots to roots for not more than 5 days. Protect Sod against drying from sun or wind and from freezing if necessary. Place Sod when weather conditions and soil moisture are favorable.

Do not place Sod on:

- Soil that is frozen and/or when the 10-day forecasted low temperature remains below 35 degrees Fahrenheit;
- Soil that is excessively wet;
- Soil that is excessively dry (periods of heat or drought) unless watering is specified;
- Soil that is composed of compacted clay; and
- Soil than has been treated with pesticides.

### 6.2 SOD BED PREPARATION

- Ensure that the Sod Bed receiving Sod is uniform and conforms to the finished grade of the Project.
- Loosen the Sod Bed to a minimum depth of three (3) inches before placing Sod.
- To ensure a good stand of Sod grass in areas where the existing Sod Bed has little or no topsoil, furnish and place topsoil or compost in the Sod Bed.
- Lay Sod when the Sod Bed is moist. If necessary, moisten dry Sod Beds before sod is laid.

### 6.3 SOD MATERIAL

Provide Sod consisting of living, well-established growth, with a dense root mat of the predominant grass specified. Provide vigorous, well rooted, healthy turf, free from disease, insect pests, weeds, other grasses, stones, and any other harmful or detrimental materials.

Provide machine stripped Sod with a uniform soil thickness of approximately 1 inch. The minimum acceptable soil thickness is  $\frac{3}{4}$  inch. The measurement for thickness excludes top growth and thatch.

## 6.4 SOD INSTALLATIONS

Typically Sod is used on small commercial projects and residential developments. Ensure that Sod applications are not installed until the end of the project or when final stabilization is achieved on adjacent areas of the project that drain or discharge to the Sod application. Do not install Sod at the beginning of the project. Do not place Sod until all work in a particular area of the project is complete and it is time for final stabilization. Project areas may require temporary stabilization by mulch until it is proper time to place Sod.

Ensure Sod is moist when laid and placed on moist ground.

Roll or fold sod before lifting. Handle Sod in a manner that prevents tearing, breaking, drying, or any other damage.

Carefully place Sod by hand, beginning at the downslope end of the application area and working upwards. Place Sod strips at right angles to the flow of surface water. Tightly butt Sod joints edge to edge with stagger joints in a brick-like pattern of at least 12 inches. Plug large gap openings with Sod and fill joints between strips with fine screened topsoil.

After laying Sod and filling joints, immediately firmly press Sod into the underlying Sod Bed by tamping or rolling with approved equipment to eliminate air pockets and provide an even surface.

Irrigate the Sod until the soil is wet to a depth of 2- to 3-inches, and keep moist until grass takes root.

Ensure installed Sod is watered, mowed, weeded, repaired, or otherwise maintained by the *CONTRACTOR*, to insure the establishment of a uniform healthy stand of grass until acceptance.

Watering may be necessary after installation and during periods of intense heat and/or lack of rain (drought).

Keep soil moist to a depth of 2- to 3-inches until sod is fully rooted.

Mow Sod to a height of 2- to 3-inches after sod is well-rooted (2-3 weeks). Do not remove more than 1/3 of the shoot in any one mowing.

Permanent, Sod turf areas will require yearly applications of fertilizer and lime. Apply lime and fertilizer according to soil tests. Only apply lime and fertilizer after the sod has established a good root system.

Inspect Sod installations frequently, especially after large storm events, until it has established a permanent cover.

## 7.0 INSPECTION AND MAINTENANCE

### 7.1 INSPECTION

Ensure that all seed, Sod, fast acting lime, biological growth stimulants, agricultural granular lime, granular fertilizer, straw and hay mulch, HECs, compost mulch, and ECBs are applied according to this *Specification*. The *CONTRACTOR* must prepare and apply these materials on-site in the presence of the *Design Engineer or Landscape Architect*, or a member of the *Design Engineer or Landscape Architect* staff. The *Design Engineer or Landscape Architect*, or member of the *Design Engineer or Landscape Architect* staff must document on-site that these materials are applied according to this *Specification* by completing and signing proper forms.

### 7.2 MAINTENANCE

Perform all maintenance necessary to keep permanent seeding, temporary cover by seeding, temporary cover by mulch, and Sod areas in a satisfactory condition until the work is finally accepted. This includes mowing, repairing areas of erosion and washes, and applying additional seed, fertilizer, and mulch to areas where a satisfactory stand of grass has not been achieved.

Perform all maintenance including watering, repairing washes, additional sodding, and fertilizing where a satisfactory stand of grass has not been achieved until acceptance.

The *CONTRACTOR* is not in violation for permanent seeding, temporary cover by seeding, temporary cover by mulch, and Sod areas damaged by insects, animals, or extreme rainfall events. An extreme rainfall event is defined as being a 25-year storm event or greater based on the inches of rain received per time interval (30-min, 1-hr, 3-hr, 6-hr, 24-hr etc.) for the particular location as determined from the current NOAA precipitation tables.

#### 7.2.1 Mowing

Mowing consists of mowing areas seeded or Sodded as necessary to provide adequate sight areas and to maintain the Project in a satisfactory manner.

Mow road shoulders and medians when vegetation reaches a height of approximately eighteen (18) to twenty four (24) inches.

Do not perform excessive mowing of Slopes resulting in ruts, furrows or grooves. Do not perform excessive mowing of Slopes that inhibits the establishment of the slope vegetation.

Ensure that mowing results in a uniform vegetation height of four (4) to six (6) inches, unless otherwise directed by the *Design Engineer or Landscape Architect*. When utilizing a nurse crop for permanent seeding, mow Millet (*no lower than 3 inches*) once it reaches a height of 18 inches to reduce competitiveness with the permanent vegetation. Mow Wheat and Rye Grain (*no lower than 3 inches*) once they reach a height of 6-8 inches to reduce competitiveness with permanent vegetation

Mow as closely as possible to all fixed objects exercising care not to damage trees, plants, shrubs, signs, delineators, or other appurtenances which are a part of the facility. Hand trimming around such objects may be required.

Remove litter and debris prior to beginning mowing operations. Immediately remove and properly dispose of all litter and debris resulting from mowing operations. Mowed grass is not normally removed unless it becomes a hazard as determined by the *Design Engineer or Landscape Architect*.

Do not perform mowing when soil and weather conditions are such that rutting or other damage to the Project may occur

### **7.3. DELIVERY, STORAGE AND HANDLING**

Deliver grass seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging, and location of packaging. Damaged packages are not acceptable.

Deliver lime, fertilizer and biological growth stimulants in sealed factory labeled waterproof bags showing weight, chemical analysis, and name of manufacturer. Damaged bags or containers are not acceptable. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage from weather, excessive temperatures, and construction operations.

Deliver Sod on pallets. Install Sod within 24 hours after cutting, except that Sod may be stored in stacks or piles, grass to grass and roots to roots for not more than 5 days. Protect stored Sod against drying from sun or wind and from freezing if necessary.

# CITY OF GREER BIORETENTION NATIVE PLANT SPECIFICATIONS

## **8.0 BIORETENTION PLANT INTRODUCTION**

Use plantings for Bioretention applications that conform to the standards of the current edition of *American Standard for Nursery Stock* as approved by the American Standards Institute, Inc.

For Bioretention applications near roadways, consider site distances and other safety concerns when selecting plant heights. Consider human activities which may damage the plantings, cause soil compaction or otherwise damage the function of the Bioretention area when selecting plant species.

Use plant materials that have normal, well developed stems or branches and a vigorous root system. Only use plantings that are healthy, free from physical defects, plant diseases, and insect pests. Symmetrically balance shade and flowering trees. Ensure major branches do not have V shaped crotches capable of causing structural weakness. Ensure trunks are free of unhealed branch removal wounds greater than a 1 in. diameter.

Use plant species that are tolerant to wide fluctuations in soil moisture content. Use plantings capable of tolerating saturated soil conditions for the length of time anticipated for the water quality volume, as well as anticipated runoff constituents. Acceptable Bioretention area plantings include:

- Turf Grass only,
- Native Grasses and Perennials,
- Shrubs, and
- Trees.

## **8.1 TURF GRASS ONLY**

Use turfgrass species with a thick dense cover, slow growing, applicable to the expected moisture conditions (dry or wet), do not require frequent mowing, and have low nutrient requirements. The preferred method of establishing turf grass is sodding. Use temporary erosion control blankets to provide temporary cover when establishing turf grass by seeding. Do not establish turf grass with the use of Hydraulic Erosion Control Product (HECPs) only.

## **8.2 NATIVE GRASSES AND PERENNIALS**

Create a low maintenance native grass or wildflower meadow with native grasses and native perennial species. Temporary erosion control blankets may be used in lieu of a hardwood mulch layer. Plant native grasses and perennials of the same species in clusters 1.0 to 1.5 feet on-center.

## **8.3 SHRUBS**

Provide shrubs a minimum of 2-feet in height. Do not plant shrubs near the inflow and outflow points of the Bioretention area. Plant shrubs of the same species in clusters 5 to 10 feet on-center.

## **8.4 TREES**

Provide trees with a minimum 1-inch caliper. Plant trees near the perimeter of the Bioretention area. Do not plant trees near the inflow and outflow points of the Bioretention area. Do not plant trees directly above Underdrains. Plant trees at a density of one tree per 250 square feet.



## 8.5 PLANTING PLAN

A Bioretention area landscape plan includes all planting types, total number of each species, and the location of each species used. The plan includes a description of the *CONTRACTOR*'s responsibilities including a planting schedule, installation specifications, initial maintenance, a warranty period, and expectations of plant survival. A planting plan includes long-term inspection and maintenance guidelines. Use planting plans prepared by a qualified landscape architect, botanist or qualified extension agent. Use native plant species over non-native species. Ornamental species may be used for landscaping effect if they are not aggressive or invasive. Native plantings are shown in Table 6.

**Table 6: Native Plant Species for Bioretention Areas**

| Perennials/Grasses  | Shrubs   | Trees   |
|---|--|---|
| Eastern Bluestar<br>( <i>Amsonia tabernaemontana</i> )  | Beautyberry<br>( <i>Callicarpa americanas</i> )          | Red Buckeye<br>( <i>Aesulus pavia</i> )                         |
| Swamp Milkweed<br>( <i>Asclepias incarnata</i> )  | Button Bush<br>( <i>Cephalanthus occidentalis</i> )      | Serviceberry<br>( <i>Amelanchier canadensis</i> )               |
| Butterfly Milkweed<br>( <i>Asclepias tuberosa</i> )   | Sweet Pepperbush<br>( <i>Clethra ainifolia</i> )         | Ironwood - American Hornbeam<br>( <i>Carpinus caroliniana</i> ) |
| White Turtlehead<br>( <i>Chelone glabra</i> )   | Common Winterberry<br>( <i>Ilex verticillata</i> )       | Eastern Redbud<br>( <i>Cercis canadensis</i> )                  |
| Joe Pye Weed<br>( <i>Eupatorium purpureum</i> )   | Virginia Sweetspire<br>( <i>Itea virginica</i> )         | Fringe Tree<br>( <i>Chionanthus virginicus</i> )                |
| Swamp Sunflower<br>( <i>Helianthus angustifolius</i> )  | Spicebush<br>( <i>Lindera benzoin</i> )                  | Silky Dogwood<br>( <i>Cornus amomum</i> )                       |
| Rose / Swamp Mallow<br>( <i>Hibiscus moscheutos</i> )   | Possumhaw<br>( <i>Viburnum nudum</i> )                   | Mayhaw, May Hawthorn<br>( <i>Crataegus aestivalis</i> )         |
| Cardinal Flower<br>( <i>Lobelia cardinalis</i> )  |  | Hawthorn<br>( <i>Crataegus marshallii</i> )                     |
| Black-eyed Susan<br>( <i>Rudbeckia fulgida</i> )  |  |   |
| Goldenrod<br>( <i>Solidago rugosa</i> )   | <b>Evergreens</b>  | <b>Evergreens</b>   |
| Ironweed<br>( <i>Vernonia noveboracensis</i> )  | Inkberry Holly<br>( <i>Ilex glabra</i> )                 | American Holly<br>( <i>Ilex opaca</i> )                         |
| <b>Grasses</b>  | Dwarf Yaupan / Yaupan Holly<br>( <i>Ilex vomitoria</i> ) | Sweetbay Magnolia<br>( <i>Magnolia virginiana</i> )             |
| Big Bluestem<br>( <i>Andropogon gerardii</i> )  | Southern Wax Myrtle<br>( <i>Myrica cerifera</i> )        |   |
| River Oats<br>( <i>Chasmanthium latifolium</i> )  |  |   |
| Virginia Wild Rye<br>( <i>Elymus virginicus</i> )   |  |   |
| Muhly Grass<br>( <i>Muhlenbergia capillaries</i> )  |  |   |
| Panic Grass / Switch Grass<br>( <i>Panicum virgatum</i> )   |  | <b>Ferns</b>  |
| Little Bluestem<br>( <i>Schiachyrium scoparium</i> )  |  | Cinnamon Fern<br>( <i>Onoclea cinnamomea</i> )                  |
| Indian Grass<br>( <i>Sorghastrum nutans</i> )   |  | Royal Fern<br>( <i>Osmunda regalis</i> )                        |
| <b>Note:</b> Prior to selection, review detailed Bioretention plant lists in <b>Appendix C</b> for more detailed information regarding inundation, drought and salt tolerance for each species. |  |   |

## 8.6 INSTALLATION

Plant all Bioretention areas grasses, native grasses, perennials, shrubs, trees, and other plant materials specified to applicable landscaping standards. Ensure all plants are installed in accordance with the Bioretention area landscape plan.

Ensure all plant materials are kept moist during transport and on-site storage.

### 8.6.1 Perennials/ Grasses

In general, space perennials/ grasses 1 to 1.5 feet apart.

Dig a hole to the depth of the perennial/ grass container. Dig the hole to a width of two to three times the diameter of the perennial/ grass container.

Remove the perennial/ grass plant from the container and place it in the hole. Adjust the hole depth as necessary. Ensure the soil ball is level with the Bioretention soil surface.

Back fill the hole with the removed soil. If necessary, mix compost into the Bioretention soil.

Compact the soil to anchor the plantings and remove air pockets, but do not overly compress the back-filled soil especially by tramping it with feet or tools. Compress gently using hands

Ensure perennial/ grass plants are watered within 30 minutes of planting.

Use a watering can or pitcher for the first watering. Water the soil at the base of each plant. A strong blast from a garden hose can dislodge and damage new plantings.

Apply a 3 to 4 inch layer of mulch around the new plantings, keeping wood chip mulch 2 to 4 inches away from base of the plant.

### 8.6.2 Shrubs

In general, space shrubs 5 to 10 feet apart depending on the specific species used.

Dig a hole to the depth of the shrub container.

Dig the hole to a width of two times the diameter of the shrub container.

If the Bioretention area has previously been mulched, use a sheet of plastic or a bucket for piling soil from the shrub hole. Ensure the Bioretention soil removed from the hole is not mixed with the mulch.

Turn the container on its side and ease the shrub out.

Trim roots with a pruner in three or four places, when the roots wrap around the soil ball.

Carefully place the shrub in the hole. Adjust the depth of the hole if necessary. Ensure the top surface of the soil ball is level with the Bioretention soil surface.

Back fill the hole with the removed soil. If necessary, mix compost into the Bioretention soil.

Compact the soil to anchor the shrub and remove air pockets, but do not overly compress the back-filled soil especially by tramping it with feet or tools. Compress gently using hands

Water the shrub within 1 hour of planting by thoroughly soaking the soil around the plant. Let the water seep in and then water again.

Apply a 3 to 4 inch layer of mulch around the new plantings, keeping wood chip mulch 4 inches away from base of the plant.

### 8.6.3 Trees

Ensure trees are transplanted no deeper than the soil in which they were originally grown. Dig the hole at least 3 times the diameter of the root ball or container or the spread of the roots in the case of bare root trees. If the Bioretention area has previously been mulched, use a sheet of plastic for piling soil from the tree hole. Ensure the Bioretention soil removed from the hole is not mixed with the mulch.

#### Balled and Burlapped Trees

Balled and burlapped trees, although best planted as soon as possible, can be stored for some time after purchase as long as the ball is kept moist and the tree is stored in a shady area. Always lift the tree by the ball, never by the trunk. Ensure the burlap surrounding the ball of earth and roots is either cut away completely (synthetic or plastic burlap) or at a minimum pulled back from the top third of the ball (natural burlap). Remove any string or twine. Backfill soil (combinations of peat moss, composted manure, topsoil, etc.) is then placed in the hole surrounding the tree just to the height of the ball or slightly lower to allow for some settling. Be careful not to compress the back fill soil as this may prevent water from reaching the roots and the roots from expanding beyond the ball.

#### Container Trees

Container trees can be stored for a brief period of time after purchase as long as the soil in the container is kept moist and the tree stored in a shady spot. The procedure for planting container trees is similar to that for balled and burlapped trees. In the case of metal or plastic containers, remove the container completely. In the case of fibre containers, tear the sides away.

Once carefully removed from the container, check the roots. If they are tightly compressed, carefully tease the fine roots away from the tight mass and then spread the roots prior to planting. In the case of extremely woody compacted roots, it may be necessary to use a spade to open up the bottom half of the root system. The root system is then pulled apart prior to planting.

#### Bare-Root Trees

Planting bare-rooted trees is different as there is no soil surrounding the roots. Ensure bare-root trees are planted as soon as possible. Inspect the roots to ensure they are moist and have numerous lengths of fine root hairs.

When planting, first build a mound of earth in the center of the hole around which to lay the roots. Ensure the tree is planted on the mound so that the crown is 2 inches above the Bioretention area soil level to allow for natural settling.

#### Backfilling and Watering

Once the tree is seated in the hole, back-fill the original soil into the hole to the soil level of the container. If necessary, mix compost into the Bioretention soil.

Compact the soil to anchor the tree and remove air pockets, but do not overly compress the back-filled

soil especially by tramping it with feet or tools. Compress gently using hands

Water the tree within 1 hour of planting by thoroughly soaking the soil around the tree to a depth of 12 to 18 inches . Let the water seep in and then water again.

Apply a 3 to 4 inch layer of mulch around the new plantings

### Staking

Brace trees using 2-inch by 2-inch stakes only as necessary. Ensure stakes are equally spaced on the outside of the tree ball.

If the planted tree is having difficulty standing upright, thin out the upper branches to reduce wind resistance. If this is not enough to assist the tree in standing upright, then stake the tree.

Only stake the tree long enough for it to be able stand on its own.

Ensure Stakes are not too tight, allowing room for the tree to sway in the wind.

Ensure Stakes are not too loose , ensuring the tree does not rub against the stakes.

Ensure Stakes are buried at least 1.5 feet underground to provide ample support.

Brace trees using 2-inch by 2-inch stakes only as necessary. Ensure stakes are equally spaced on the outside of the tree ball.

# APPENDIX A

## SIMPLIFIED SEEDING TABLES

## Non Slope Areas

### Spring / Summer Non Slope Areas (during establishment, mow when Millet reaches 18-inches in height)

| Common Name <sup>4</sup>                                  | Botanical Name          | Planting Rate (lbs/acre) | Planting Rate (lbs/1000sf) | Planting Dates |     |     |     |     |     |     |     |     |     |     |     | Characteristics |  |
|---|-------------------------|--------------------------|----------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|--|
|   |                         |                          |                            | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                 |  |
| ✓ Common Bermudagrass <sup>1</sup> (hulled = hull absent) | <i>Cynodon dactylon</i> | 50                       | 1.15                       |                |     |     | •   | •   | •   | •   |     |     |     |     |     |                 | Long-lived, warm season perennial, grows 4-6 inches tall. High heat tolerance, salt tolerant, high nitrogen requirement. |
| ✓ White Clover  | <i>Trifolium repens</i> | 5                        | 0.11                       |                |     | •   | •   |     |     |     |     | •   |     |     |     |                 | Grows to 1 foot tall. Full sun, low drought tolerance. Good erosion control cover.                                       |
| ✓ Browntop Millet   | <i>Panicum ramosum</i>  | 10                       | 0.23                       |                |     |     | •   | •   | •   | •   | •   |     |     |     |     |                 | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.                        |

### Fall / Winter Non Slope Areas (during establishment, mow when Rye reaches 6 to 8-inches in height)

| Common Name <sup>4</sup>                                     | Botanical Name              | Planting Rate (lbs/acre) | Planting Rate (lbs/1000sf) | Planting Dates |     |     |     |     |     |     |     |     |     |     |     | Characteristics |  |
|--|-----------------------------|--------------------------|----------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|--|
|  |                             |                          |                            | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                 |  |
| ✓ Tall Fescue (KY-31)  | <i>Festuca arundinacea</i>  | 50                       | 1.15                       | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | •               | Bunch-type grass, grows 2-4 feet tall. Full sun to part shade. Good heat and drought tolerance as well as shade tolerance. Tolerant to marginal, acidic, and poorly drained soils and in areas of low fertility. |
| ✓ Common Bermudagrass <sup>1</sup> (unhulled = hull present) | <i>Cynodon dactylon</i>     | 15                       | 0.34                       | •              | •   | •   |     |     |     |     |     |     | •   | •   | •   | •               | Long-lived, warm season perennial, grows 4-6 inches tall. High heat tolerance, salt tolerant, high nitrogen requirement.   |
| ✓ White Clover   | <i>Trifolium repens</i>     | 5                        | 0.11                       |                | •   | •   | •   |     |     |     |     |     | •   | •   | •   |                 | Grows to 1 foot tall. Full sun, low drought tolerance, low salt tolerance. Good erosion control cover.   |
| ✓ Crimson Clover <sup>2</sup>                                | <i>Trifolium incarnatum</i> | 20                       | 0.46                       | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | •               | Upright winter legume, grows from 1-3 feet tall. Full sun, low drought tolerance, no salt tolerance.   |
| ✓ Rye Grain <sup>3</sup>                                     | <i>Secale cereale</i>       | 15                       | 0.34                       | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | •               | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.  |

<sup>1</sup> Common Bermudagrass: Do not use Giant Bermudagrass(NK-37).



<sup>2</sup> Only use pre-inoculated legumes or use an appropriate inoculant with the seed at planting.

<sup>3</sup> Mow Rye Grain (no lower than 3 inches) once it reaches a height of 6-8 inches to reduce competitiveness with permanent vegetation.





<sup>4</sup> If the Common Name of the seed listed in the Tables is not available, use seed with the listed Botanical Name.

## Road Medians & Shoulders

### Spring / Summer Road Median & Shoulders (during establishment, mow when Millet reaches 18-inches in height)

| Common Name <sup>4</sup>   | Botanical Name          | Planting Rate (lbs/acre) | Planting Rate (lbs/1000sf) | Planting Dates |     |     |     |     |     |     |     |     |     |     |     | Characteristics |  |
|--|-------------------------|--------------------------|----------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|--|
|  |                         |                          |                            | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                 |  |
|  Common Bermudagrass <sup>1</sup><br>(hulled = hull absent) | <i>Cynodon dactylon</i> | 25                       | 0.57                       |                |     |     | •   | •   | •   | •   |     |     |     |     |     |                 | Long-lived, warm season perennial, grows 4-6 inches tall. High heat tolerance, salt tolerant, high nitrogen requirement. |
|  Browntop Millet  | <i>Panicum ramosum</i>  | 10                       | 0.23                       |                |     |     | •   | •   | •   | •   | •   |     |     |     |     |                 | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.                        |

### Fall / Winter Road Median & Shoulders (during establishment, mow when Rye reaches 6 to 8-inches in height)

| Common Name <sup>4</sup>  | Botanical Name              | Planting Rate (lbs/acre) | Planting Rate (lbs/1000sf) | Planting Dates |     |     |     |     |     |     |     |     |     |     |     | Characteristics |  |
|---|-----------------------------|--------------------------|----------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|--|
|   |                             |                          |                            | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                 |  |
|  Tall Fescue (KY-31)   | <i>Festuca aruninacea</i>   | 50                       | 1.15                       | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | •               | Bunch-type grass, grows 2-4 feet tall. Full sun to part shade. Good heat and drought tolerance as well as shade tolerance. Tolerant to marginal, acidic, and poorly drained soils and in areas of low fertility. |
|  Common Bermudagrass <sup>1</sup><br>(unhulled = hull present) | <i>Cynodon dactylon</i>     | 15                       | 0.34                       | •              | •   | •   |     |     |     |     |     |     | •   | •   | •   | •               | Long-lived, warm season perennial, spreads by rhizomes/stolons seed, grows 4-6 inches tall. High heat tolerance, salt tolerant, high nitrogen requirement.   |
|  Crimson Clover <sup>2</sup>                                   | <i>Trifolium incarnatum</i> | 20                       | 0.46                       | •              | •   | •   |     |     |     |     |     |     | •   | •   | •   | •               | Upright winter legume, grows from 1-3 feet tall. Full sun, low drought tolerance, no salt tolerance.   |
|  Rye Grain <sup>3</sup>  | <i>Secale cereale</i>       | 15                       | 0.34                       | •              | •   | •   |     |     |     |     |     |     | •   | •   | •   | •               | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.  |

<sup>1</sup> Common Bermudagrass: Do not use Giant Bermudagrass(NK-37).

<sup>2</sup> Only use pre-inoculated legumes or use an appropriate inoculant with the seed at planting.

<sup>3</sup> Mow Rye Grain (no lower than 3 inches) once it reaches a height of 6-8 inches to reduce competitiveness with permanent vegetation.

<sup>4</sup> If the Common Name of the seed listed in the Tables is not available, use seed with the listed Botanical Name.

## Slopes & Buffers

**Spring / Summer Slopes (during establishment, mow when Millet reaches 18-inches in height. After establishment, only mow at end of winter season)**

|        | Common Name <sup>4</sup>                                | Botanical Name            | Planting Rate (lbs/acre) | Planting Rate (lbs/1000sf) | Planting Dates |     |     |     |     |     |     |     |     |     |     |     | Characteristics |  |
|--------|---|---------------------------|--------------------------|----------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|--|
|        |   |                           |                          |                            | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                 |  |
| Pick 1 | Tall Fescue (KY-31)                                     | <i>Festuca aruninacea</i> | 50                       | 1.15                       |                |     | ●   | ●   |     |     |     |     |     |     |     |     |                 | Bunch-type grass, grows 2-4 feet tall. Full sun to part shade. Good heat and drought tolerance as well as shade tolerance. Tolerant to marginal, acidic, and poorly drained soils and in areas of low fertility.   |
|        | Bahiagrass  | <i>Paspalum notatum</i>   | 30                       | 0.69                       |                |     | ●   | ●   | ●   | ●   |     |     |     |     |     |     |                 | Warm season perennial, spreads by rhizomes, grows 1-2 feet tall, deep root system. Shade tolerant, salt tolerant, drought tolerant. Low maintenance, tough grass surviving conditions that destroy most turf grasses. Adapts to most soil conditions and extremely tolerant to wear and traffic. |
|        | Common Bermudagrass <sup>1</sup> (hulled = hull absent) | <i>Cynodon dactylon</i>   | 15                       | 0.34                       |                |     |     | ●   | ●   | ●   | ●   |     |     |     |     |     |                 | Long-lived, warm season perennial, grows 4-6 inches tall. High heat tolerance, high nitrogen requirement.  |
|        | White Clover  | <i>Trifolium repens</i>   | 5                        | 0.11                       |                |     | ●   | ●   |     |     |     | ●   |     |     |     |     |                 | Warm season bunch grass, deep root system, grows 3-6 feet tall. Full sun, high drought tolerance.  |
|        | Weeping Lovegrass                                       | <i>Erograstis curvula</i> | 5                        | 0.11                       |                |     | ●   | ●   | ●   | ●   | ●   |     |     |     |     |     |                 | Warm season bunch grass, grows 3 feet tall. Full sun, high drought tolerance. Plant at 10%-20% of mix.   |
|        | Hairy Vetch <sup>2</sup>                                | <i>Vicia villosa</i>      | 10                       | 0.23                       |                |     |     | ●   |     |     |     |     |     |     |     |     |                 | Cool season biennial or annual legume. Viney, trailing or climbing growth. Wide range of soil types, best adapted to loamy and sandy soils.  |
|        | Browntop Millet   | <i>Panicum ramosum</i>    | 10                       | 0.23                       |                |     |     | ●   | ●   | ●   | ●   |     |     |     |     |     |                 | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance.   |

**Fall / Winter Slopes (during establishment, mow when Rye reaches 6 to 8-inches in height. After establishment, only mow at end of winter season)**

|        | Common Name <sup>4</sup>                                   | Botanical Name              | Planting Rate (lbs/acre) | Planting Rate (lbs/1000sf) | Planting Dates |     |     |     |     |     |     |     |     |     |     |     | Characteristics |  |
|--------|--|-----------------------------|--------------------------|----------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|--|
|        |  |                             |                          |                            | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                 |  |
|        | Tall Fescue (KY-31)  | <i>Festuca aruninacea</i>   | 50                       | 1.15                       | ●              | ●   | ●   |     |     |     |     |     |     | ●   | ●   | ●   | ●               | Bunch-type grass, grows 2-4 feet tall. Full sun to part shade. Good heat and drought tolerance as well as shade tolerance. Tolerant to marginal, acidic, and poorly drained soils and in areas of low fertility. |
|        | Common Bermudagrass <sup>1</sup> (unhulled = hull present) | <i>Cynodon dactylon</i>     | 15                       | 0.34                       | ●              | ●   | ●   |     |     |     |     |     |     | ●   | ●   | ●   | ●               | Long-lived, warm season perennial, grows 4-6 inches tall. High heat tolerance, high nitrogen requirement.  |
|        | White Clover <sup>2</sup>                                  | <i>Trifolium repens</i>     | 5                        | 0.11                       |                | ●   | ●   |     |     |     |     |     |     | ●   | ●   | ●   |                 | Grows to 1 foot tall. Full sun, low drought tolerance, low salt tolerance. Good erosion control cover.   |
|        | Weeping Lovegrass  | <i>Erograstis curvula</i>   | 5                        | 0.11                       | ●              | ●   | ●   |     |     |     |     |     |     | ●   | ●   | ●   | ●               | Warm season bunch grass, grows 3 feet tall. Full sun, high drought tolerance.  |
| Pick 1 | Crimson Clover <sup>2</sup>                                | <i>Trifolium incarnatum</i> | 20                       | 0.46                       | ●              | ●   | ●   |     |     |     |     |     |     | ●   | ●   | ●   | ●               | Upright winter legume, grows from 1-3 feet tall. Full sun, low drought tolerance, no salt tolerance.   |
|        | Hairy Vetch <sup>2</sup>                                   | <i>Vicia villosa</i>        | 10                       | 0.23                       | ●              | ●   | ●   |     |     |     |     |     |     | ●   | ●   | ●   | ●               | Cool season biennial or annual legume. Viney, trailing or climbing growth. Wide range of soil types, best adapted to loamy and sandy soils.  |
|        | Rye Grain <sup>3</sup>                                     | <i>Secale cereale</i>       | 15                       | 0.34                       | ●              | ●   | ●   |     |     |     |     |     |     | ●   | ●   | ●   | ●               | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.  |

<sup>1</sup> Common Bermudagrass: Do not use Giant Bermudagrass(NK-37).

<sup>2</sup> Only use pre-inoculated legumes or use an appropriate inoculant with the seed at planting.

<sup>3</sup> Mow Rye Grain (no lower than 3 inches) once it reaches a height of 6-8 inches to reduce competitiveness with permanent vegetation.

<sup>4</sup> If the Common Name of the seed listed in the Tables is not available, use seed with the listed Botanical Name.



# APPENDIX B

## DETAILED SEEDING TABLES

**TABLE B-1: DETAILED SEEDING PERRENIALS**

\* Months shaded in green represent applicable planting dates

| COMMON NAME <sup>7</sup>                                      | BOTANICAL NAME       | APPROVED SITE(S) | PLANTING RATE (lbs/acre) | Planting Dates* |     |     |     |     |     |     |     |     |     |     |     |
|---|----------------------|------------------|--------------------------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|   |                      |                  |                          | JAN             | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| <b>TURF-TYPE GRASSES (SELECT ONE MINIMUM)</b>                 |                      |                  |                          |                 |     |     |     |     |     |     |     |     |     |     |     |
| Bahiagrass <sup>1</sup>                                       | Paspalum notatum     | ALL              | 30                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Common Bermudagrass <sup>2</sup><br>(hulled = hull absent)    | Cynodon dactylon     | ALL              | 25                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Common Bermudagrass <sup>2</sup><br>(unhulled = hull present) | Cynodon dactylon     | ALL              | 30                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Tall Fescue (KY-31) <sup>3</sup>                              | Festuca arundinacea  | ALL              | 50                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| <b>GRASSES (SELECT ONE MINIMUM)</b>                           |                      |                  |                          |                 |     |     |     |     |     |     |     |     |     |     |     |
| Weeping Lovegrass   | Erograstis curvula   | Slopes           | 5                        |                 |     |     |     |     |     |     |     |     |     |     |     |
| Indiangrass   | Sorghastrum nutans   | Slopes, Buffers  | 10                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Little Bluestem   | Andropogon scoparius | Slopes, Buffers  | 10                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Coastal Panicgrass  | Panicum amarum       | Slopes, Buffers  | 20                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Switchgrass   | Panicum virgatum     | Slopes, Buffers  | 10                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Perennial Rye Grass <sup>4</sup>                              | Lolium perrene       | ALL              | 15                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Virginia Wild Rye   | Elymus virginicus    | Slopes, Buffers  | 6                        |                 |     |     |     |     |     |     |     |     |     |     |     |
| <b>LEGUMES<sup>5</sup> (SELECT ONE MINIMUM)</b>               |                      |                  |                          |                 |     |     |     |     |     |     |     |     |     |     |     |
| White Clover  | Trifolium repens     | ALL              | 5                        |                 |     |     |     |     |     |     |     |     |     |     |     |
| Crownvetch  | Coronilla varia      | Slopes, Buffers  | 25                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Sericea Lespedeza <sup>6</sup><br>(Scarified seed)            | Lespedeza cuneata    | Slopes           | 50                       |                 |     |     |     |     |     |     |     |     |     |     |     |
| Sericea Lespedeza <sup>6</sup><br>(Unscarified seed)          | Lespedeza cuneata    | Slopes           | 80                       |                 |     |     |     |     |     |     |     |     |     |     |     |

<sup>1</sup> May be used in select areas at the discretion of the City Engineer.

\* Months shaded in green represent applicable planting dates

<sup>2</sup> Common Bermudagrass: *Do not use Giant Bermudagrass (NK-37).*

<sup>3</sup> Tall Fescue (KY-31): *Do not use Tall Fescue (Lolium arundinacea).*

<sup>4</sup> Perennial Rye Grass: *Do not use Annual Italian Rye grass (Lolium multiflorum).*

<sup>5</sup> Only use pre-inoculated legumes or use an appropriate inoculant with the seed at planting.

<sup>6</sup> Use Sericea Lespedeza on Slopes where other species will not adequately thrive.

<sup>7</sup> If the Common Name of the seed listed in the Table is not available, use seed with the listed Botanical Name.

**TABLE B-2: DETAILED SEEDING ANNUALS**

\* Months shaded in green represent applicable planting dates.

| COMMON NAME <sup>5</sup>                           | BOTANICAL NAME                | APPROVED SITE(S)            | NURSE CROP RATE (lbs/acre) | TEMP COVER RATE (lbs/acre) | Planting Dates* |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
|--|-------------------------------|-----------------------------|----------------------------|----------------------------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|--|--|
|  |                               |                             |                            |                            | JAN             | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |  |  |  |  |  |  |
| <b>Crimson Clover</b> <sup>1</sup>                 | Trifolium incarnatum          | ALL                         | 20                         | 20                         |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Lespedeza Kobe / Korean</b> <sup>1</sup>        | Lespedeza striata /stipulacea | Shoulders / Medians, Slopes | 15                         | 60                         |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Browntop Millet</b> <sup>2</sup>                | Panicum ramosum               | ALL                         | 10                         | 40                         |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>German Millet (Foxtail Millet)</b> <sup>2</sup> | Setaria italica               | ALL                         | 10                         | 40                         |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Japanese Millet</b> <sup>2</sup>                | Echinochloa crusgalli         | Slopes                      | 10                         | 50                         |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Oats</b>  | Avena sativa                  | Slopes                      | 40                         | 110                        |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Hairy Vetch</b> <sup>1</sup>                    | Vicia villosa                 | ALL                         | 15                         | 50                         |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Pearl Millet</b>                                | Pennisetum glaucum            | Slopes                      | 15                         | 50                         |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Sudangrass</b>                                  | Sorghum bicolor               | Buffers                     | 20                         | 60                         |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Barley</b>                                      | Hordeum vulgare               | Slopes                      | 55                         | 110                        |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Wheat</b> <sup>4</sup>                          | Triticum spp.                 | Slopes                      | 35                         | 110                        |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |
| <b>Rye Grain</b> <sup>3,4</sup>                    | Secale cereale                | ALL                         | 40                         | 110                        |                 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |  |  |  |

<sup>1</sup> Only use pre-inoculated legumes or an appropriate inoculant with the seed at planting.

\* Months shaded in green represent applicable planting dates.

<sup>2</sup> Mow Millet (no lower than 3 inches) once it reaches a height of 18 inches to reduce competitiveness with permanent vegetation.

<sup>3</sup> Rye Grain: Do not use Annual Italian Rye Grass (Lolium multiflorum).

<sup>4</sup> Mow Wheat and Rye Grain (no lower than 3 inches) once they reach a height of 6-8 inches to reduce competitiveness with permanent vegetation.

<sup>5</sup> If the Common Name of the seed listed in the Table is not available, use seed with the listed Botanical Name. Do not use Wild Bird, Wild Animal, or Domestic Feed Seed.

## Detailed Schedule

**Instructions:** Find the appropriate table and choose the appropriate seed type from each section. If a seed type is not available for the needed month, follow the directions in the first column to choose another seed type. The total number of seed types used should match the number of sections for that category. When applying granular fertilizer, use a 10-10-10 blend unless a soil analysis or known soil conditions warrant a different type.

### Non Slope Areas & Road Shoulders and Medians

|                             | Common Name <sup>8</sup>                                   | Botanical Name   | Planting Rate (lbs/acre) | Planting Rate (lbs/1000sf) | Planting Dates |     |     |     |     |     |     |     |     |     |     |     | Use Areas                       | Description   | Habitat  | Characteristics   |
|-----------------------------|--|--|--------------------------|----------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------------------------|---|--|---|
|                             |  |  |                          |                            | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                                 |   |  |   |
| Pick 1 Turf-Type (Minimum)  | Bahiagrass <sup>1</sup>                                    | <i>Paspalum notatum</i>                                  | 30                       | 0.7                        |                |     | •   | •   | •   | •   | •   |     |     |     |     |     | ALL                             | Non Native Creeping Perennial Grass                 | Sandy and infertile soils, heavy traffic areas, water conveyance channels. Acid soil tolerant, not high pH tolerant. Listed as Significant Threat on SC Invasive list. | Warm season perennial, spreads by rhizomes, grows 1-2 feet tall, deep root system. Sandy soils, shade tolerant, salt tolerant, drought tolerant. Low maintenance, tough, coarse bladed grass surviving conditions that destroy most turf grasses. Adapts to most soil conditions and is extremely tolerant to wear and traffic. |
|                             | Common Bermudagrass <sup>2</sup> (unhulled = hull present) | <i>Cynodon dactylon</i>                                  | 30                       | 0.7                        | •              | •   | •   |     |     |     |     |     | •   | •   | •   | •   | ALL                             | Non Native Creeping Perennial Grass                 | Lawns, public areas, problem soils, heavy traffic areas, water conveyance area, pH 5.0 - 8.0   | Long-lived, warm season perennial, spreads by rhizomes/stolons seed, grows 4-6 inches tall. High heat tolerance, salt tolerant, high nitrogen requirement. Used for channels, pond banks, grassed waterways, and vegetated flumes.  |
|                             | Common Bermudagrass <sup>2</sup> (hulled = hull absent)    | <i>Cynodon dactylon</i>                                  | 25                       | 0.6                        |                |     |     | •   | •   | •   | •   |     |     |     |     |     | ALL                             | Non Native Creeping Perennial Grass                 | Lawns, public areas, problem soils, heavy traffic areas, water conveyance area, pH 5.0 - 8.0   | Long-lived, warm season perennial, spreads by rhizomes/stolons seed, grows 4-6 inches tall. High heat tolerance, salt tolerant, high nitrogen requirement. Used for channels, pond banks, grassed waterways, and vegetated flumes.  |
|                             | Tall Fescue (KY-31) <sup>3</sup>                           | <i>Festuca arundinacea</i>                               | 50                       | 1.15                       | •              | •   | •   | •   |     |     |     |     |     |     |     |     | ALL                             | Non Native Tall Growing Cool-season Perennial Grass | Lawns, public areas, problem soils, heavy traffic areas, pH 5.5 - 8.0.   | Bunch-type grass, grows 2-4 feet tall. Full sun to part shade. Good heat and drought tolerance as well as shade tolerance. Tolerant to marginal, acidic, and poorly drained soils and in areas of low fertility, and where stresses occur due to drought. Durable due to an extensive, deep root system.                        |
|                             | Carpet Grass / Centipede-grass Combo                       | <i>Axonopus affinis</i><br><i>Eremochloa ophiuroides</i> | 15<br>10                 | 0.3<br>0.2                 |                |     | •   | •   | •   | •   | •   | •   |     |     |     |     | Non Slopes, Shoulders / Medians | Non Native Creeping Perennial Grass                 | Slightly acidic sandy or sandy-loam soils with available moisture, pH 5.0-6.0  | Warm-season shallow-rooted creeping perennial grass, dense sod by rooting at nodes along stolons. Poor drought resistance. Thrives under lower fertility. Does not withstand prolonged flooding or permanent swampy conditions.   |
|                             | Perennial Rye Grass <sup>4</sup>                           | <i>Lolium perenne</i>                                    | 15                       | 0.3                        | •              | •   | •   | •   |     |     |     |     | •   | •   | •   | •   | ALL                             | Naturalized Herbaceous Perennial                    | Medium fertility, acid, clay, and loamy soils, pH 5.2-7.5  | Fast growing, short term, cool season bunch grass, grows 1-2 feet tall. Full sun, low drought tolerance, moderate salt tolerance.   |
|                             | White Clover <sup>5</sup>                                  | <i>Trifolium repens</i>                                  | 5                        | 0.1                        |                | •   | •   | •   |     |     |     |     | •   | •   | •   |     | ALL                             | Naturalized Herbaceous Perennial Legume             | Moist soils, field borders, pH 6.0-7.5.  | Grows to 1 foot tall. Full sun, low drought tolerance, low salt tolerance. Good erosion control cover.  |
| Pick 1 Nurse Crop (Minimum) | Crimson Clover <sup>5</sup>                                | <i>Trifolium incarnatum</i>                              | 20                       | 0.5                        | •              | •   | •   |     |     |     |     |     |     | •   | •   | •   | ALL                             | Naturalized Herbaceous Annual Legume                | Sandy and clay like soils, pH 5.5 - 7.5.   | Upright winter legume, grows from 1-3 feet tall. Full sun, low drought tolerance, no salt tolerance.  |
|                             | Lespedeza <sup>5</sup> Kobe / Korean                       | <i>Lespedeza striata/stipulacea</i>                      | 15                       | 0.3                        |                |     | •   | •   | •   | •   | •   |     |     |     |     |     | Shoulders / Medians, Slopes     | Warm Season Annual Legume                           | Prefers well-drained clay or loamy soil. Tolerates acidic soil, and poorer soil types. Excellent heat and drought tolerance  | Low-growing summer legume. Used as pasture and hay legumes, erosion control, and on a limited scale for seed production.  |
|                             | Browntop Millet <sup>6</sup>                               | <i>Panicum ramosum</i>                                   | 10                       | 0.2                        |                |     |     | •   | •   | •   | •   | •   |     |     |     |     | ALL                             | Naturalized Herbaceous Annual                       | Infertile, sandy, or acid soils, pH 5.2-8.0  | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.   |
|                             | German Millet <sup>6</sup> (Foxtail Millet)                | <i>Setaria italica</i>                                   | 10                       | 0.2                        |                |     |     |     | •   | •   | •   | •   |     |     |     |     | ALL                             | Warm season annual grass                            | Suitable for moist, well-drained sandy, loamy, and clay like soils. Adapts to a wide range of pH. Drought tolerant, shade intolerant.                                  | Medium height around 4 feet   |
|                             | Hairy Vetch <sup>5</sup>                                   | <i>Vicia villosa</i>                                     | 15                       | 0.3                        | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | ALL                             | Cool season biennial or annual legume               | Wide range of soil types, best adapted to loamy and sandy soils, pH 5.0 to 8.2. Prefers well-drained soils with a pH 6.0-7.0. Does poorly in clay or wet fields        | Viney, trailing or climbing growth. Stems may grow 2 to 5 feet long. Used for soil improvement along roadsides and for bank stabilization/erosion control   |
|                             | Rye Grain <sup>7</sup>                                     | <i>Secale cereale</i>                                    | 40                       | 0.9                        | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | ALL                             | Naturalized Herbaceous Annual                       | Infertile, sandy, or acid soils, pH 5.2-8.0  | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.   |

<sup>1</sup> May be used as an optional turf-type permanent cover.

<sup>2</sup> Common Bermudagrass: Do not use Giant Bermudagrass(NK-37).

<sup>3</sup> Tall Fescue (KY-31): Do not use Tall Fescue (Lolium arundinacea).

<sup>4</sup> Perennial Rye Grass: Do not use Annual Italian Rye grass (Lolium multiflorum).

<sup>5</sup> Only use pre-inoculated legumes or use an appropriate inoculant with the seed at planting.

<sup>6</sup> Mow Millet (no lower than 3 inches) once it reaches a height of 18 inches to reduce competitiveness with permanent vegetation.

<sup>7</sup> Mow Rye Grain (no lower than 3 inches) once it reaches a height of 6-8 inches to reduce competitiveness with permanent vegetation.

<sup>8</sup> If the Common Name of the seed listed in the Tables is not available, use seed with the listed Botanical Name.

# Slopes & Buffers

|                             | Common Name <sup>9</sup>                                   | Botanical Name                        | Planting Rate (lbs/acre) | Planting Rate (lbs/1000sf) | Planting Dates |     |     |     |     |     |     |     |     |     |     |     | Use Areas                     | Description                                 | Habitat  | Characteristics   |
|-----------------------------|--|---------------------------------------|--------------------------|----------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------------|---|--|---|
|                             |  |                                       |                          |                            | Jan            | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |                               |   |  |   |
| Pick 1 Turf-Type (Minimum)  | Bahiagrass <sup>1</sup>                                    | <i>Paspalum notatum</i>               | 30                       | 0.7                        |                |     | •   |     | •   | •   | •   |     |     |     |     |     | ALL                           | Non Native Creeping Perennial Grass         | Sandy and infertile soils, heavy traffic areas, water conveyance channels. Acid soil tolerant, not high pH tolerant. Listed as Significant Threat on SC Invasive list. | Warm season perennial, spreads by rhizomes, grows 1-2 feet tall, deep root system. Sandy soils, shade tolerant, salt tolerant, drought tolerant. Low maintenance, tough, coarse bladed grass surviving conditions that destroy most turf grasses. Adapts to most soil conditions and is extremely tolerant to wear and traffic. |
|                             | Common Bermudagrass <sup>2</sup> (unhulled = hull present) | <i>Cynodon dactylon</i>               | 30                       | 0.7                        | •              | •   | •   |     |     |     |     |     |     | •   | •   | •   | ALL                           | Non Native Creeping Perennial Grass         | Lawns, public areas, problem soils, heavy traffic areas, water conveyance area, pH 5.0 - 8.0   | Long-lived, warm season perennial, spreads by rhizomes/stolons seed, grows 4-6 inches tall. High heat tolerance, salt tolerant, high nitrogen requirement. Used for channels, pond banks, grassed waterways, and vegetated fumes.   |
|                             | Common Bermudagrass <sup>2</sup> (hulled = hull absent)    | <i>Cynodon dactylon</i>               | 25                       | 0.6                        |                |     |     | •   | •   | •   | •   |     |     |     |     |     | ALL                           | Non Native Creeping Perennial Grass         | Lawns, public areas, problem soils, heavy traffic areas, water conveyance area, pH 5.0 - 8.0   | Long-lived, warm season perennial, spreads by rhizomes/stolons seed, grows 4-6 inches tall. High heat tolerance, salt tolerant, high nitrogen requirement. Used for channels, pond banks, grassed waterways, and vegetated fumes.   |
|                             | Tall Fescue (KY-31) <sup>3</sup>                           | <i>Festuca arundinacea</i>            | 50                       | 1.15                       | •              | •   | •   | •   |     |     |     |     |     |     | •   | •   | •                             | ALL   | Non Native Tall Growing Cool-season Perennial Grass  | Lawns, public areas, problem soils, heavy traffic areas, pH 5.5 - 8.0.  |
| Pick 1                      | Weeping Lovegrass  | <i>Eragrostis curvula</i>             | 5                        | 0.1                        |                |     |     | •   | •   | •   | •   |     |     |     |     |     | Slopes                        | Naturalized Herbaceous Perennial            | Light textured, low fertility, well drained soils, pH 4.5-8.0.   | Warm season bunch grass, grows 3 feet tall. Full sun, high drought tolerance.   |
|                             | Indiangrass  | <i>Sorghastrum nutans</i>             | 10                       | 0.2                        | •              | •   | •   | •   | •   | •   |     |     |     |     |     |     | Slopes, Buffers               | Native Herbaceous Perennial                 | Most or dry fields, roadsides and serpentine barrens.  | Warm season bunch grass, grows to 6 feet tall. Full sun, moderate drought tolerance, moderate salt tolerance.   |
|                             | Little Bluestem  | <i>Schizachyrium scoparium</i>        | 10                       | 0.2                        | •              | •   | •   | •   | •   | •   |     |     |     |     | •   | •   | Slopes, Buffers               | Native Herbaceous Perennial                 | Meadows, roadsides, slopes, grows in a wide variety of soils including infertile soils, pH 5.5 to 8.5 pH, refers 7.0 and slightly higher.                              | Tall warm-season Native perennial grass - 2 to 4 ft height. Bunch type grass, rhizomatous grass. Excellent drought tolerance, poor flood tolerance and some shade tolerance. Good erosion control.  |
|                             | Coastal Panicgrass   | <i>Panicum amarum</i>                 | 20                       | 0.5                        |                | •   | •   | •   | •   | •   |     |     |     |     |     |     | Slopes, Buffers               | Native Herbaceous Perennial                 | Sandy shores, alluvium, fields and banks, pH 5.0 - 8.0   | Warm season bunch grass, deep root system, grows 3-6 feet tall. Full sun, high drought tolerance, moderate salt tolerance.  |
|                             | Switchgrass  | <i>Panicum virgatum</i>               | 10                       | 0.2                        | •              | •   | •   | •   | •   | •   |     |     |     |     | •   | •   | Slopes, Buffers               | Native Herbaceous Perennial                 | Variety of soils and temperatures, tolerant of moisture extremes, refuge for animals. Soil pH 5.0 or above.  | Tall warm-season Native perennial grass - 2 to 6 ft height. Used in naturalized plantings, great for erosion control. Eco-friendly - requires little if any chemical fertilization.   |
|                             | Perennial Rye Grass <sup>4</sup>                           | <i>Lolium perenne</i>                 | 15                       | 0.3                        | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | ALL                           | Naturalized Herbaceous Perennial            | Medium fertility, acid, clay, and loamy soils, pH 5.2-7.5  | Fast growing, short term, cool season bunch grass, grows 1-2 feet tall. Full sun, low drought tolerance, moderate salt tolerance.   |
|                             | Virginia Wildrye   | <i>Elymus virginicus</i>              | 10                       | 0.2                        |                | •   | •   |     |     |     |     |     |     |     | •   | •   | Slopes, Buffers               | Native Herbaceous Perennial                 | Moist woods, meadows, and riverbanks, pH 5.0 - 7.4   | Short-lived, cool season bunch grass, grows 3-6 feet tall. Shade tolerant, moderate drought tolerance, no salt tolerance.   |
| Pick 1                      | White Clover <sup>5</sup>                                  | <i>Trifolium repens</i>               | 5                        | 0.1                        | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | ALL                           | Naturalized Herbaceous Perennial Legume     | Moist soils, field borders, pH 6.0-7.5.  | Grows to 1 foot tall. Full sun, low drought tolerance, low salt tolerance. Good erosion control cover.  |
|                             | Crownvetch <sup>5</sup>                                    | <i>Coronilla varia</i>                | 25                       | 0.6                        | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | Slopes, Buffers               | Naturalized Herbaceous Perennial Legume     | Tolerant of low pH and low fertility   | Low-growing vine with a creeping stem that grows to less than 2 feet. Prefers full sun, but will grow in sparse shade. Grows in rocky dry sites as well as moist areas with good drainage, clay and shallow soils.  |
|                             | Sericea Lespedeza <sup>6</sup> (Scarified seed)            | <i>Lespedeza cuneata</i>              | 50                       | 1.15                       |                |     |     | •   | •   | •   | •   |     |     |     |     |     | Slopes                        | Naturalized Herbaceous Perennial Legume     | Deep, well-drained, medium to coarse textured soils. Tolerant of low pH (4.5) and infertile soils. Optimum pH range is 6.0-6.5.  | Cool-season perennial legume grows 2 to 4 feet. Can be invasive. Widely branched that penetrate soil more than 3 feet.  |
| Pick 2 Nurse Crop (Minimum) | Sericea Lespedeza <sup>6</sup> (Unscarified seed)          | <i>Lespedeza cuneata</i>              | 80                       | 1.8                        | •              | •   | •   | •   |     |     |     |     |     | •   | •   | •   | Slopes                        | Naturalized Herbaceous Perennial Legume     | Deep, well-drained, medium to coarse textured soils. Tolerant of low pH (4.5) and infertile soils. Optimum pH range is 6.0-6.5.  | Cool-season perennial legume grows 2 to 4 feet. Can be invasive. Widely branched that penetrate soil more than 3 feet.  |
|                             | Crimson Clover <sup>5</sup>                                | <i>Trifolium incarnatum</i>           | 20                       | 0.5                        | •              | •   | •   |     |     |     |     |     |     | •   | •   | •   | ALL                           | Naturalized Herbaceous Annual Legume        | Sandy and clay like soils, pH 5.5 - 7.5.   | Upright winter legume, grows from 1-3 feet tall. Full sun, low drought tolerance, no salt tolerance.  |
|                             | Lespedeza <sup>5</sup> Kobe / Korean                       | <i>Lespedeza striata / stipulacea</i> | 15                       | 0.3                        |                |     | •   | •   | •   | •   |     |     |     |     |     |     | Shoulders / Medians, Slopes   | Warm Season Annual Legume                   | Prefers well-drained clay or loamy soil. Tolerates acidic soil, and poorer soil types. Excellent heat and drought tolerance  | Low-growing summer legume. Used as pasture and hay legumes, erosion control, and on a limited scale for seed production.  |
|                             | Browntop Millet <sup>7</sup>                               | <i>Panicum ramosum</i>                | 10                       | 0.2                        |                |     | •   | •   | •   | •   | •   |     |     |     |     |     | ALL                           | Naturalized Herbaceous Annual               | Infertile, sandy, or acid soils, pH 5.2-8.0  | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.   |
|                             | German Millet <sup>7</sup> (Foxtail Millet)                | <i>Setaria italica</i>                | 10                       | 0.2                        |                |     |     |     | •   | •   | •   | •   |     |     |     |     | ALL                           | Warm season annual grass                    | Suitable for moist, well-drained sandy, loamy, and clay like soils. Adapts to a wide range of pH. Drought tolerant, shade intolerant.                                  | Medium height around 4 feet   |
|                             | Oats   | <i>Avena sativa</i>                   | 40                       | 0.9                        |                |     |     |     |     |     |     |     |     | •   | •   | •   | Slopes                        | Winter annual small grain                   | Suitable for most soil types. Can grow in Very acidic, heavy clay and nutritionally poor soils. Prefers well-drained soil.   | Tall stemmy growth in spring up to 3 feet   |
|                             | Hairy Vetch <sup>5</sup>                                   | <i>Vicia villosa</i>                  | 15                       | 0.3                        | •              | •   | •   | •   |     |     |     |     |     |     | •   | •   | ALL                           | Cool season biennial or annual legume       | Wide range of soil types, best adapted to loamy and sandy soils, pH 5.0 to 8.2. Prefers well-drained soils with a pH 6.0-7.0. Does poorly in clay or wet fields        | Viney, trailing or climbing growth. Stems may grow 2 to 5 feet long. Used for soil improvement along roadsides and for bank stabilization/erosion control   |
|                             | Sudangrass   | <i>Sorghum bicolor</i>                | 20                       | 0.5                        |                |     |     | •   | •   | •   | •   | •   |     |     |     |     | Slopes, Buffers               | Naturalized Herbaceous Annual               | Adapts to most soil types, pH 5.5-8.0  | Annual warm season pasture grass, grows 3-5 feet tall. Full sun, to partial shade, drought tolerance, moderate salt tolerance.  |
|                             | Wheat <sup>8</sup>   | <i>Triticum spp.</i>                  | 35                       | 0.8                        | •              | •   | •   | •   |     |     |     |     |     |     | •   | •   | Slopes, Buffers               | Winter annual small grain                   | Adapts to a wide range of soils, but prefers fertile, well-drained soils.  | Tall stemmy growth in spring. Leaf blades flat, stems 1 to 4 feet, thick spikes, two to four sided.   |
| Rye Grain <sup>8</sup>      | <i>Secale cereale</i>                                      | 40                                    | 0.9                      | •                          | •              | •   |     |     |     |     |     |     |     | •   | •   | ALL | Naturalized Herbaceous Annual | Infertile, sandy, or acid soils, pH 5.2-8.0 | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.  |   |

<sup>1</sup> May be used as an optional turf-type permanent cover.

<sup>2</sup> Common Bermudagrass: Do not use Giant Bermudagrass(NK-37).

<sup>3</sup> Tall Fescue (KY-31): Do not use Tall Fescue (Lolium arundinacea).

<sup>4</sup> Perennial Rye Grass: Do not use Annual Italian Rye grass (Lolium multiflorum).

<sup>5</sup> Only use pre-inoculated legumes or use an appropriate inoculant with the seed at planting.

<sup>6</sup> Use Sericea Lespedeza on Slopes where other species will not adequately thrive.

<sup>7</sup> Mow Millet (no lower than 3 inches) once it reaches a height of 18 inches to reduce competitiveness with permanent vegetation.

<sup>8</sup> Mow Wheat and Rye Grain (no lower than 3 inches) once they reach a height of 6-8 inches to reduce competitiveness with permanent vegetation.

<sup>9</sup> If the Common Name of the seed listed in the Tables is not available, use seed with the listed Botanical

## Annuals

| COMMON NAME <sup>4</sup>                       | BOTANICAL NAME                        | APPROVED SITE(S)            | NURSE CROP RATE (lbs/acre) | TEMP COVER RATE (lbs/acre) | Planting Dates <sup>5</sup> |     |     |     |     |     |     |     |     |     |     |     | Use Areas | Description                 | Habitat                               | Characteristics   |   |
|--|---------------------------------------|-----------------------------|----------------------------|----------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------|-----------------------------|---------------------------------------|---|---|
|  |                                       |                             |                            |                            | JAN                         | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |           |                             |                                       |   |   |
| Crimson Clover <sup>1</sup>                    | <i>Trifolium incarnatum</i>           | ALL                         | 20                         | 20                         | ●                           | ●   | ●   |     |     |     |     |     | ●   | ●   | ●   | ●   | ●         | ALL                         | Naturalized Herbaceous Annual Legume  | Sandy and clay like soils, pH 5.5 - 7.5.  | Upright winter legume, grows from 1-3 feet tall. Full sun, low drought tolerance, no salt tolerance.  |
| Lespedeza <sup>1</sup><br>Kobe / Korean        | <i>Lespedeza striata / stipulacea</i> | Shoulders / Medians, Slopes | 15                         | 60                         |                             |     | ●   | ●   | ●   | ●   | ●   |     |     |     |     |     |           | Shoulders / Medians, Slopes | Warm Season Annual Legume             | Prefers well-drained clay or loamy soil. Tolerates acidic soil, and poorer soil types. Excellent heat and drought tolerance                                     | Low-growing summer legume. Used as pasture and hay legumes, erosion control, and on a limited scale for seed production.                                  |
| Browntop Millet <sup>2</sup>                   | <i>Panicum ramosum</i>                | ALL                         | 10                         | 40                         |                             |     |     | ●   | ●   | ●   | ●   | ●   |     |     |     |     |           | ALL                         | Naturalized Herbaceous Annual         | Infertile, sandy, or acid soils, pH 5.2-8.0   | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.   |
| German Millet <sup>2</sup><br>(Foxtail Millet) | <i>Setaria italica</i>                | ALL                         | 10                         | 40                         |                             |     |     | ●   | ●   | ●   | ●   |     |     |     |     |     |           | ALL                         | Warm season annual grass              | Suitable for moist, well-drained sandy, loamy, and clay like soils. Adapts to a wide range of pH. Drought tolerant, shade intolerant.                           | Medium height around 4 feet   |
| Japanese Millet <sup>2</sup>                   | <i>Echinochloa crusgalli</i>          | Slopes                      | 10                         | 50                         |                             |     |     | ●   | ●   | ●   | ●   |     |     |     |     |     |           | Slopes                      | Warm season annual grass              | Suitable for moist, well-drained sandy, loamy, and clay like soils. Adapts to a wide range of pH. Drought tolerant, shade intolerant.                           | Can be weedy. Medium height around 4 feet   |
| Oats   | <i>Avena sativa</i>                   | Slopes                      | 40                         | 110                        |                             |     |     |     |     |     |     |     | ●   | ●   | ●   | ●   |           | Slopes                      | Winter annual small grain             | Suitable for most soil types. Can grow in Very acidic, heavy clay and nutritionally poor soils. Prefers well-drained soil.                                      | Tall stemmy growth in spring up to 3 feet   |
| Hairy Vetch <sup>1</sup>                       | <i>Vicia villosa</i>                  | ALL                         | 15                         | 50                         | ●                           | ●   | ●   | ●   |     |     |     |     |     | ●   | ●   | ●   | ●         | ALL                         | Cool season biennial or annual legume | Wide range of soil types, best adapted to loamy and sandy soils, pH 5.0 to 8.2. Prefers well-drained soils with a pH 6.0-7.0. Does poorly in clay or wet fields | Viney, trailing or climbing growth. Stems may grow 2 to 5 feet long. Used for soil improvement along roadsides and for bank stabilization/erosion control |
| Pearl Millet                                   | <i>Pennisetum glaucum</i>             | Slopes                      | 15                         | 50                         |                             |     |     | ●   | ●   | ●   | ●   | ●   |     |     |     |     |           | Slopes                      | Tall warm season annual grass         | Adapts to coarse and medium textured soils, pH 5.5-6.8. Medium drought tolerance, shade intolerant.   | 4 to 7 feet growth potential  |
| Sudangrass                                     | <i>Sorghum bicolor</i>                | Slopes, Buffers             | 20                         | 60                         |                             |     |     | ●   | ●   | ●   | ●   | ●   |     |     |     |     |           | Slopes, Buffers             | Naturalized Herbaceous Annual         | Adapts to most soil types, pH 5.5-8.0   | Annual warm season pasture grass, grows 3-5 feet tall. Full sun, to partial shade, drought tolerance, moderate salt tolerance.                            |
| Barley   | <i>Hordeum vulgare</i>                | Slopes                      | 55                         | 110                        |                             |     |     |     |     |     |     |     |     | ●   | ●   | ●   |           | Slopes                      | Winter annual small grain             | Adapts to medium textured soils, pH 5.0-8.5. Medium drought tolerance, shade intolerant.  | Tall stemmy growth in spring  |
| Wheat <sup>4</sup>                             | <i>Triticum spp.</i>                  | Slopes, Buffers             | 35                         | 110                        | ●                           | ●   | ●   | ●   |     |     |     |     |     | ●   | ●   | ●   | ●         | Slopes, Buffers             | Winter annual small grain             | Adapts to a wide range of soils, but prefers fertile, well-drained soils.   | Tall stemmy growth in spring. Leaf blades flat, stems 1 to 4 feet, thick spikes, two to four sided.   |
| Rye Grain <sup>3,4</sup>                       | <i>Secale cereale</i>                 | ALL                         | 40                         | 110                        | ●                           | ●   | ●   | ●   |     |     |     |     |     | ●   | ●   | ●   | ●         | ALL                         | Naturalized Herbaceous Annual         | Infertile, sandy, or acid soils, pH 5.2-8.0   | Bunch type grain, grows 2-5 feet tall. Full sun, moderate drought tolerance, high salt tolerance.   |

<sup>1</sup> Only use pre-inoculated legumes or an appropriate inoculant with the seed at planting.

<sup>2</sup> Mow Millet (no lower than 3 inches) once it reaches a height of 18 inches to reduce competitiveness with permanent vegetation.

<sup>3</sup> Rye Grain: Do not use Perennial Rye Grass or Annual Italian Rye Grass (*Lolium multiflorum*).

<sup>4</sup> Mow Wheat and Rye Grain (no lower than 3 inches) once they reach a height of 6-8 inches to reduce competitiveness with permanent vegetation.

<sup>5</sup> If the Common Name of the seed listed in the Table is not available, use seed with the listed Botanical Name.

# APPENDIX C

## BIORETENTION PLANTING TABLES

**TABLE C-1: BIORETENTION PLANTINGS**

| Botanical Name                            | Common Name  | Height    | Zone <sup>1</sup> | Light                 | Description   |
|---|--|-----------|-------------------|-----------------------|---|
| <b>Small Trees Under 30-feet Tall</b>     |  |           |                   |                       |   |
| <i>Aesculus pavia</i>                     | Red Buckeye  | 10-15 ft. | 2                 | Sun /shade            | Spring flowers, prefers part shade, may defoliate early in season.  |
| <i>Amalanchier canadensis</i>             | Serviceberry   | 12-20 ft. | 2                 | Sun /<br>part shade   | Salt resistant; moist to average soils; Tolerates part shade; Multi-stem grey bark, early spring white flowers, early purple berries, red in fall; high wildlife value, fruits for birds.       |
| <i>Carpinus caroliniana</i>               | Ironwood<br>American Hornbeam  | 30 ft.    | 1,3               | Sun /shade            | Shade tolerant, handles inundation of water, unique silver fluted trunk.  |
| <i>Cercis canadensis</i>                  | Eastern Redbud   | 20-35 ft. | 1,2               | Part shade/<br>shade  | Shade tolerant. Moist soils but not too wet; Drought tolerant; many good cultivars.   |
| <i>Chionanthus virginicus</i>             | Fringe Tree  | 20 ft.    | 2                 | Sun /shade            | Moist soils; excellent small urban tree; Can be shrubby; fragrant pendulous white spring flowers and gold fall color.   |
| <i>Cornus amomum</i>                      | Silky Dogwood  | 6-12 ft.  | 3                 | Sun                   | Flood tolerant; intermediate drought & heat resistant; fruit for birds.   |
| <i>Crataegus aestivalis</i>               | Mayhaw<br>May Hawthorn   | 20 ft.    | 3                 | Sun                   | Thorn attractive to nesting birds, red fruit, purple to scarlet in fall.  |
| <i>Crataegus marshallii</i>               | Hawthorn   | 25 ft.    | 3                 | Sun /shade            | Slender, thorny, or sometimes thorn less, branches. White blossoms followed by bright-red, persistent fruits. Leaves become colorful in fall. Seasonally poor drainage is okay.                 |
| <i>Ilex opaca</i><br>(evergreen)          | American Holly   | 15-30 ft. | 1,2               | Sun / shade           | Medium drought tolerance; Bioretention soil must be sandy loam - intolerant to coarse soils (loamy sand); Sun to shade evergreen, slow growing, white flowers, red berries.                     |
| <i>Magnolia virginiana</i><br>(evergreen) | Sweetbay Magnolia  | 15-30 ft. | 3                 | Sun /<br>part shade   | Sun to shade semi-evergreen, fragrant flowers, bright red berries, often multi-stem.  |
| <b>Shrubs</b>                             |  |           |                   |                       |   |
| <i>Callicarpa americana</i>               | Beautyberry  | 6 ft.     | 2                 | Sun / shade           | Average to droughty soils ; no anaerobic tolerance; Striking purple berries on new growth, yellow fall color, sun to part shade; well-suited for mountains.                                     |
| <i>Cephalanthus occidentalis</i>          | Button Bush  | 8 ft.     | 3                 | Part shade /<br>shade | Tolerates flooding, white button flowers persist, attracts hummingbirds; salt-tolerant.   |
| <i>Clethra alnifolia</i>                  | Sweet Pepperbush   | 8 ft.     | 2                 | Sun/ shade            | Extremely fragrant white or pink flowers in summer, yellow in fall; Excellent for coastal gardens due to salt-tolerance.  |
| <i>Ilex verticillata</i>                  | Common Winterberry   | 6-10 ft.  | 3                 | Sun /<br>part shade   | Flood tolerant intermediate drought resistance; Soil must be sandy loam, intolerant to coarse soils (loamy sand). White flowers with red berries retained in winter; well-suited for mountains. |
| <i>Itea virginica</i>                     | Virginia Sweetspire  | 3-6 ft.   | 3                 | Sun/ shade            | Medium shrub. Fragrant white tassel flowers, deep red or purple fall foliage. Well suited for Piedmont. Prefers moist soils.  |
| <i>Lindera benzoin</i>                    | Spicebush  | 8 ft.     | 3                 | Part shade /<br>shade | Very early chartreuse flowers, fragrant leaves, pale yellow fall color. Suitable for Coast.   |
| <i>Viburnum nudum</i>                     | Possumhaw<br>Viburnum  | 6-12 ft.  | 3                 | Sun /<br>part shade   | Very flood tolerant & drought tolerant; salt resistant; spring flowers, fruit for birds, fall color, tolerates part shade.  |
| <i>Ilex glabra</i><br>(evergreen)         | Inkberry Holly   | 6-8 ft.   | 3                 | Sun / shade           | Very flood tolerant. Salt resistant; Hi anaerobic tolerance. White flowers with black berries.  |
| <i>Ilex vomitoria</i><br>(evergreen)      | Yaupon Holly   | 8-15 ft.  | 1,2               | Sun /<br>part shade   | High drought tolerance, No anaerobic tolerance. Red fruit in fall & winter. Long lasting translucent berries.   |
| <i>Myrica cerifera</i><br>(evergreen)     | Wax Myrtle   | 15-20 ft. | 1,2               | Sun /<br>part shade   | Very flood tolerant; excellent salt & resistance; medium drought resistance; medium anaerobic tolerance; medium N fixing. Fragrant leaves, berries for candles, can prune as a hedge.           |
| <b>Wetness Zone<sup>1</sup></b>           | <p>1 Plants that, once established, withstand drought ( 3-4 weeks without rainfall); Establishment is 1-2 yrs for trees &amp; shrubs, 1 yr for perennials &amp; grasses</p> <p>2 Plants that grow best in moist to average soils and only tolerate short periods (1-2 days) of flooding.</p> <p>3 Plants that tolerate longer periods of flooding (3-5 days), but also grow in moist to average soils.</p> |           |                   |                       |   |



| Botanical Name                  | Common Name   | Height  | Zone <sup>1</sup> | Light              | Description  |
|---------------------------------|---|---------|-------------------|--------------------|--|
| <b>Perennials</b>               |   |         |                   |                    |  |
| <i>Amsonia tabernaemontana</i>  | Eastern Bluestar  | 1-3 ft. | 3                 | Sun / part shade   | Wetland plant that is Drought resistant; pale blue tubular flowers.  |
| <i>Asclepias incarnata</i>      | Swamp Milkweed  | 2-4 ft. | 3                 | Sun                | Pink rose-purple blooms in mid-summer, attracts butterflies. Thrives in mucky clay soils.  |
| <i>Asclepias tuberosa</i>       | Butterfly Milkweed  | 2-3 ft. | 1                 | Sun / part shade   | Prefers well-drained sandy soils. Tolerates drought. Striking and rugged plant with orange flowers that attract butterflies. Slow to establish and easy to grow from seed. |
| <i>Chelone glabra</i>           | White Turtlehead  | 1-4 ft. | 3                 | Sun                | Snapdragon type white flowers, often lavender tinged. Attracts butterflies and hummingbirds. Suitable for Piedmont.  |
| <i>Eupatorium dubium</i>        | Joe Pye Weed  | 3-6 ft. | 3                 | Sun                | Rapid grower with large pink to purple flowers that attract butterflies. Has no salt tolerance.  |
| <i>Helianthus angustifolius</i> | Swamp Sunflower   | 4-7 ft. | 3                 | Sun / part shade   | Tall yellow daisy flowers with maroon center. Good seed source for birds. Salt-tolerant.   |
| <i>Hibiscus moscheutos</i>      | Rose Mallow<br>Swamp Mallow   | 3-8 ft. | 3                 | Sun / part shade   | Huge white to pink flowers that attract hummingbirds. Salt-tolerant.   |
| <i>Lobelia cardinalis</i>       | Cardinal Flower   | 1-6 ft. | 3                 | Sun/ shade         | Drought resistant; Bioretention soil must be sandy loam - intolerant to coarse soils (loamy sand). Brilliant red flower spikes that attract butterflies and hummingbirds.  |
| <i>Rudbeckia fulgida</i>        | Black-eyed susan  | 1-3 ft. | 2                 | Sun                | Moist to dry soils; showy flowers; other species & cultivars. Self-sows and produces abundant offsets.   |
| <i>Solidago rugosa</i>          | Goldenrod   | 1-4 ft. | 3                 | Sun                | Thin sprays of arching flowering stems occur at the top of sturdy stems. Other species & cultivars.  |
| <i>Vernonia noveboracensis</i>  | Ironweed  | 5-8 ft. | 3                 | Sun                | Tall red-purple flower clusters late summer & early fall that attract butterflies. Tolerates inundation.   |
| <b>Grasses</b>                  |   |         |                   |                    |  |
| <i>Andropogon gerardii</i>      | Big Bluestem  | 6-8 ft. | 1,2               | Sun / part shade   | Bunch grass with a blue-green color turning maroon-tan color in fall. Deep roots and drought resistant. Moderately tolerant of acidity and salinity                        |
| <i>Chasmanthium latifolium</i>  | River Oats  | 2-4 ft. | 1,3               | Part shade / shade | Clump forming. Dangling oats are ornamental and copper in fall. Medium drought and anaerobic tolerance; showy seed clusters, spreads by seed.                              |
| <i>Elymus virginicus</i>        | Virginia Wild Rye   | 2-4 ft. | 1,3               | Sun / part shade   | Lush green, upright growing grass.   |
| <i>Muhlenbergia capillaris</i>  | Muhly Grass   | 1-3 ft. | 1,3               | Sun                | In the fall, creates a stunning pink to lavender floral display. Functions well in meadow gardens.   |
| <i>Panicum virgatum</i>         | Panic Grass<br>Switch grass   | 3-6 ft. | 1,3               | Sun / part shade   | Clump forming grass very tolerant of flooding and tolerates dry soils and is drought resistant; some salt-tolerance; fuzzy flower heads.                                   |
| <i>Schizachyrium scoparium</i>  | Little Bluestem   | 2-3 ft. | 1,2               | Sun / part shade   | Clump grass that attracts birds and mammals. Blue-green stems that turn mahogany-red with white seed tufts in the fall. Readily reseeds. Suitable for the Coast.           |
| <i>Sorghastrum nutans</i>       | Indiangrass   | 3-6 ft. | 1,2               | Sun / shade        | Tall, bunching sod-former, with broad blue-green blades and a large, plume-like, soft, golden-brown seed head. Fall color is deep orange to purple. Drought tolerant.      |
| <b>Ferns</b>                    |   |         |                   |                    |  |
| <i>Osmunda cinnamomea</i>       | Cinnamon Fern   | 3-4 ft. | 3                 | Part shade / shade | Ideal for moist areas of Bioretention area. Non-flowering plant that reproduces by spores.   |
| <i>Osmunda regalis</i>          | Royal Fern  | 2-3 ft. | 3                 | Part shade / shade | Tolerates year-round shallow water.  |
| <b>Wetness Zone<sup>1</sup></b> | <b>1</b> Plants that, once established, withstand drought (3-4 weeks without rainfall); Establishment is 1-2 yrs for trees & shrubs, 1 yr for perennials & grasses<br><b>2</b> Plants that grow best in moist to average soils and only tolerate short periods (1-2 days) of flooding.<br><b>3</b> Plants that tolerate longer periods of flooding (3-5 days), but also grow in moist to average soils. |         |                   |                    |  |

# APPENDIX D

## STABILIZATION CHECKLIST

## CITY OF GREER STABILIZATION CHECKLIST

**PROJECT NUMBER:** \_\_\_\_\_ **PROJECT NAME:** \_\_\_\_\_

**Total Area of Application (acres):** \_\_\_\_\_

**Application Area(s):**  Flat Areas  Slopes / Buffers  Shoulders / Medians

**Application:**  Permanent Cover  Temp. Cover by Seeding  Temp. Cover by Mulch

**Has a seeding plan been sent to and approved by the ENGINEER?**  YES  NO

**Has a soil analysis been conducted (if YES, attach a copy to this form)?**  YES  NO

**Has a certified copy of the soil analysis been submitted to the ENGINEER?**  YES  NO

**Has the seedbed been properly prepared for application?**  YES  NO

**Is seed individually packaged, bagged and tagged, clearly stating all requirements?**  YES  NO  NA

**Substitution:**  YES  NO  NA

*If acceptable seeds are not available and the most practicable alternative seed is substituted then the Contractor must submit data to the ENGINEER showing that the substitute seed is appropriate for the specific application.*

| PERMANENT COVER: <input type="checkbox"/> complete entire chart               |  | Y<br>E<br>S | N<br>O | APPLIED<br>TOTAL | APPLIED<br>RATE <sup>1</sup> | RECOMMENDED<br>RATE |
|---|--|-------------|--------|------------------|------------------------------|---------------------|
| TEMP COVER BY SEEDING: <input type="checkbox"/> complete shaded items only    |  |             |        |                  |                              |                     |
| SEED<br>TYPES:  |  |             |        | lbs              | lb/acre                      | lb/acre             |
|   |  |             |        | lbs              | lb/acre                      | lb/acre             |
|   |  |             |        | lbs              | lb/acre                      | lb/acre             |
|   |  |             |        | lbs              | lb/acre                      | lb/acre             |
|   |  |             |        | lbs              | lb/acre                      | lb/acre             |
|   |  |             |        | lbs              | lb/acre                      | lb/acre             |
|   |  |             |        | lbs              | lb/acre                      | lb/acre             |
| FAST ACTING LIME <input type="checkbox"/> LIQUID <input type="checkbox"/> DRY |  |             |        | lbs or gal       | lbs or gal/acre              | lbs or gal/acre     |
| AG GRANULAR LIME (from soil analysis)   |  |             |        | lbs              | lb/acre                      | lb/acre             |
| BIOLOGICAL GROWTH STIMULANT   |  |             |        | gal              | gal/acre                     | gal/acre            |
| SLOW RELEASE NITROGEN (N) (from soil analysis) <sup>2</sup>                   |  |             |        | lbs              | lb/acre                      | lb/acre             |
| PHOSPHORUS (P2O5) (from soil analysis) <sup>3</sup>                           |  |             |        | lbs              | lb/acre                      | lb/acre             |
| POTASSIUM (K2O) (from soil analysis) <sup>4</sup>                             |  |             |        | lbs              | lb/acre                      | lb/acre             |
| MULCH TYPE <sup>1</sup> :   |  |             |        | lbs              | lb/acre                      | lb/acre             |
| MULCH APPLIED AT RECOMMENDED RATE <sup>1</sup>                                |  |             |        | N/A              | N/A                          | N/A                 |
| EROSION CONTROL BLANKET (ECB)   |  |             |        | ft <sup>2</sup>  | N/A                          | N/A                 |
| TURF REINFORCEMENT MAT (TRM)  |  |             |        | ft <sup>2</sup>  | N/A                          | N/A                 |
| WOOD CHIPS OR COMPOST   |  |             |        | cy               | cy/acre                      | cy/acre             |

<sup>1</sup> Applied Rate = Applied Total / Application Area (acres)

<sup>2</sup> bag wt. (lbs) \_\_\_\_\_ x # bags \_\_\_\_\_ x % Nitrogen (N)/bag \_\_\_\_\_ = total applied weight (lbs) of (N) \_\_\_\_\_

<sup>3</sup> bag wt. (lbs) \_\_\_\_\_ x # bags \_\_\_\_\_ x % Phosphorus (P205)/bag \_\_\_\_\_ = total applied weight (lbs) of (P205) \_\_\_\_\_

<sup>4</sup> bag wt. (lbs) \_\_\_\_\_ x # bags \_\_\_\_\_ x % Potassium (K)/bag \_\_\_\_\_ = total applied weight (lbs) of (K) \_\_\_\_\_



### MULCH APPLICATION TABLE

| Mulch                       | Applicable Slopes (H:V) <sup>1</sup> | Minimum Application Rate (lbs/acre -dry) <sup>2</sup> |
|-----------------------------|--------------------------------------|---|
| Wood Chips                  | ≤ 4:1                                | 500 CY/acre   |
| Straw or Hay with Tackifier | ≤ 4:1                                | 2,000   |
| HECP Type 1                 | ≤ 4:1                                | 2,000   |
| HECP Type 2                 | 4:1 < S ≤ 3:1                        | 2,500   |
| HECP Type 3                 | 3:1 < S ≤ 2:1                        | 3,000   |
| HECP Type 4                 | 2:1 < S ≤ 1:1                        | 3,500   |
|                             | > 1:1                                | 4,000 (temp cover only) <sup>3</sup>                  |
| Compost Mulch               | ≤ 2:1                                | 200 CY/acre   |

- 1 The maximum allowable continuous slope length for all mulch applications is 50 feet. Slope interruption devices or TRMs are required for continuous slope length longer than 50 feet.
- 2 Strictly comply with the manufacturer's mixing recommendations for the actual slope steepness and the actual continuous slope length of the application.
- 3 HECP Type 4 may be used for permanent cover applications on slopes 1:1 or greater at a minimum rate of 4,500 pounds per acre.

### ECB and TRM APPLICATION TABLE

| ECB/TRM Type <sup>1</sup>   | Slope (H:V) <sup>2</sup> | Minimum Slope Length (ft) |
|-----------------------------|--------------------------|---------------------------|
| Temporary ECB or Type 1 TRM | ≤ 2:1                    | 5                         |
| Type 2 TRM                  | ≤ 1.5:1                  | 5                         |
| Type 3 TRM                  | ≤ 1:1                    | 5                         |

- 1 Strictly comply with the manufacturer's specifications.
- 2 The maximum allowable continuous slope length for ECBs is 50 feet. Slope interruption devices or TRMs are required for continuous slope length longer than 50 feet.