DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA  

SPECIAL PROVISION  

Section 700—Grassing

Delete Section 700 and substitute the following:

700.1 General Description
This work includes preparing the ground, furnishing, planting, seeding, fertilizing, sodding, and mulching disturbed areas within the Right-of-Way limits and easement areas adjacent to the right-of-way as shown on the Plans except as designated by the Engineer to remain natural.

700.1.01 Definitions
General Provisions 101 through 150.

700.1.02 Related References
A. Standard Specifications
   Section 160—Reclamation of Material Pits and Waste Areas
   Section 163—Miscellaneous Erosion Control Items
   Section 718—Wood Fiber
   Section 822—Emulsified Asphalt
   Section 882—Lime
   Section 890—Seed and Sod
   Section 891—Fertilizers
   Section 893—Miscellaneous Planting Materials
   Section 895—Polyacrylamide
B. Referenced Documents
   QPL 33
   QPL 84

700.1.03 Submittals
Submit manufacturer’s product expiration date along with written instructions to ensure proper application, safety, storage, and handling of Polyacrylamide products used in The Work.
700.2 Materials
Use materials that meet the requirements of the following Specifications:

<table>
<thead>
<tr>
<th>Material</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood Fiber Mulch</td>
<td>718.2</td>
</tr>
<tr>
<td>Agricultural Lime</td>
<td>882.2.01</td>
</tr>
<tr>
<td>Seed</td>
<td>890.2.01</td>
</tr>
<tr>
<td>Sod</td>
<td>890.2.02</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>891.2.01</td>
</tr>
<tr>
<td>Plant Topsoil</td>
<td>893.2.01</td>
</tr>
<tr>
<td>Mulch</td>
<td>893.2.02</td>
</tr>
<tr>
<td>Inoculants</td>
<td>QPL 84</td>
</tr>
<tr>
<td>Tackifiers</td>
<td>QPL 33</td>
</tr>
<tr>
<td>Anionic Polyacrylamide</td>
<td>QPL 84 &amp; Section 895</td>
</tr>
</tbody>
</table>

A. Seeds
Whenever seeds are specified by their common names, use the strains indicated by their botanical names.

B. Water
Obtain the water for grassing from an approved source. Use water free of harmful chemicals, acids, alkalies, and other substances that may harm plant growth or emit odors. Do not use salt or brackish water.

C. Agricultural Lime
Agricultural lime rates will be based on a laboratory soil test report. The Contractor is responsible for ensuring the tests are performed by an approved laboratory. Provide a copy of test results to the Engineer. Refer to Section 882 Lime and GSP 18 of the Sampling and Testing Inspection manual for additional information on rates, use, handling and sampling procedures.

D. Fertilizer Mixed Grade
Fertilizer analysis and rates will be based on a laboratory soil test report. The Contractor is responsible for ensuring the tests are performed by an approved laboratory. Provide a copy of test results to the Engineer. Refer to Section 891 Fertilizer and GSP 18 of the Sampling and Testing Inspection manual for additional information on rates, use, handling and sampling procedures.

E. Mulch
Use straw or hay mulch according to Subsection 700.3.05.G.
Use wood fiber mulch in hydroseeding according to Subsection 700.3.05.F.1.

700.2.01 Delivery, Storage, and Handling
General Provisions 101 through 150.

700.3 Construction Requirements

700.3.01 Personnel
General Provisions 101 through 150.

700.3.02 Equipment
Use grassing equipment able to produce the required results.
Never allow the grading (height of cut) to exceed the grassing equipment’s operating range.
Section 700—Grassing

A. Mulch Material Equipment
   Use mulching equipment that uniformly cuts the specified materials into the soil to the required control depth.

B. Hydroseeding Equipment
   For hydroseeding equipment, see Subsection 700.3.05.F.

700.3.03 Preparation
General Provisions 101 through 150.

700.3.04 Fabrication
General Provisions 101 through 150.

700.3.05 Construction
Follow the planting zones, planting dates, types of seed, seed mixtures, and application rates described throughout this Section. The Engineer has the authority to alter the planting dates as set forth by a period of 2 weeks. This 2-week period may be applied to either the beginning of the specified planting and/or to the end of the end of the specified planting season.

In general:

- Obtain the Engineer’s approval before changing the ground cover type.
- Do not use annual rye grass seeds with permanent grassing.
- Follow the planting zones indicated on the Georgia State Planting Zone Map, below.
- Sod may be installed throughout the year, weather permitting.
- For permanent grassing, apply the combined amounts of all seeds for each time period within each planting zone and roadway location listed in the Seeding Table, below. Do not exceed the amounts of specified seed.
## NON-NATIVE GRASS SEEDING TABLE 1
(Temporary and Permanent Seed Types for Shoulders, Medians and Slopes 3:1 or Flatter)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Class/Type</th>
<th>Rate/Acre</th>
<th>Planting Zone</th>
<th>Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Bermuda Grass (Hulled)</td>
<td><em>Cynodon dactylon</em></td>
<td>Required Permanent Grass</td>
<td>10 (11)</td>
<td>1</td>
<td>April 16 – August 31</td>
</tr>
<tr>
<td>Common Bermuda Grass (Unhulled)</td>
<td><em>Cynodon dactylon</em></td>
<td>Required Permanent Grass</td>
<td>10 (11)</td>
<td>2,3,4</td>
<td>April 1 – October 15</td>
</tr>
<tr>
<td>Bahaia Grass</td>
<td><em>Paspalum motatum</em></td>
<td></td>
<td>10 (11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rye Grass, Millet, Cereal Grass (Oats)</td>
<td><em>Lolium penne ssp., Multiflorum, Echinochloa cursgalli, Avena sativa</em></td>
<td>Temporary Grass</td>
<td>50 (56)</td>
<td>1</td>
<td>September 1 – April 15</td>
</tr>
<tr>
<td>Rye Grass, Millet, Cereal Grass (Oats)</td>
<td><em>Lolium penne ssp., Multiflorum, Echinochloa cursgalli, Avena sativa</em></td>
<td>Temporary Grass</td>
<td>50 (56)</td>
<td>2,3,4</td>
<td>October 16 – March 31</td>
</tr>
</tbody>
</table>
NON-NATIVE SEEDING TABLE 2
(Temporary and Permanent Seed Types
for back slopes, fill slopes and areas which will not be subject
to frequent mowing, slopes steeper than 3:1)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Class/Type</th>
<th>Rate/Acre</th>
<th>Planting Zone</th>
<th>Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate Lespedeza</td>
<td>Lespedeza sericea</td>
<td>Permanent Grass</td>
<td>50(56)</td>
<td>1,2</td>
<td>March 1 – August 31</td>
</tr>
<tr>
<td>Weeping Lovegrass</td>
<td>Eragrostis curvula</td>
<td>Temporary Grass</td>
<td>10(11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate Lespedeza</td>
<td>Lespedeza sericea</td>
<td>Permanent Grass</td>
<td>75(84)</td>
<td>1,2</td>
<td>September 1 – February 28</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>Festuca arundinacea</td>
<td>Temporary Grass</td>
<td>50(56)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate Lespedeza</td>
<td>Lespedeza sericea</td>
<td>Permanent Grass</td>
<td>50(56)</td>
<td>3,4</td>
<td>April 1 – October 31</td>
</tr>
<tr>
<td>Weeping Love Grass</td>
<td>Eragrostis curvula</td>
<td>Temporary Grass</td>
<td>10(11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interstate Lespedeza</td>
<td>Lespedeza sericea</td>
<td>Permanent Grass</td>
<td>50(56)</td>
<td>3,4</td>
<td>November 1 – March 31</td>
</tr>
<tr>
<td>Weeping Love Grass</td>
<td>Eragrostis curvula</td>
<td>Temporary Grass</td>
<td>10(11)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NATIVE GRASS SEEDING TABLE 3

For Non-mowable Slopes or Areas Designated as Permanent Native Grass Plots.

Plant native seed mixes on back slopes, fill slopes and areas which will not be subject to frequent mowing (slopes steeper than 3:1).

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
<th>Class/Type</th>
<th>Rate/Acre</th>
<th>Planting Zone</th>
<th>Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada Wild Rye</td>
<td><em>Elymus canadensis</em></td>
<td>Cool Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>Virginia Wild Rye</td>
<td><em>Elymus virginicus</em></td>
<td>Cool Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>Bottle-brush Grass</td>
<td><em>Hystrix patula</em></td>
<td>Cool Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>Little Bluestem</td>
<td><em>Schizachyrium scoparium</em></td>
<td>Warm Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>March 31 - August 31</td>
</tr>
<tr>
<td>Indiangrass</td>
<td><em>Sorghastrum nutans</em></td>
<td>Warm Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>March 31 - August 31</td>
</tr>
<tr>
<td>Eastern Gama Grass</td>
<td><em>Tripsacum dactyloides</em></td>
<td>Warm Season</td>
<td>Minimum</td>
<td>1,2,3,4,2,3,4</td>
<td>March 31 - August 31</td>
</tr>
<tr>
<td>Rice Cut Grass</td>
<td><em>Leersia oryzoides</em></td>
<td>Warm Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>March 31 - August 31</td>
</tr>
<tr>
<td>Deertongue</td>
<td><em>Panicum clandestinum</em></td>
<td>Warm Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>March 31 - August 31</td>
</tr>
<tr>
<td>Switchgrass</td>
<td><em>Panicum virgatum</em></td>
<td>Warm Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>March 31 - August 31</td>
</tr>
<tr>
<td>Woolgrass</td>
<td><em>Scirpus cyperinus</em></td>
<td>Cool Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>River Oats</td>
<td><em>Chasmanthium latifolium</em></td>
<td>Cool Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>October 31 - March 31</td>
</tr>
<tr>
<td>Purple Top</td>
<td><em>Tridens flavus</em></td>
<td>Warm Season</td>
<td>Minimum</td>
<td>1,2,3,4</td>
<td>March 31 - August 31</td>
</tr>
</tbody>
</table>

See plan sheets/plant lists for detailed native restoration and riparian mitigation seed mix combinations to be applied at a minimum rate total of 10 (11) lbs per acre (kg/hectare) for each combined mix. If the mix is not provided in the plan sheets, use a minimum of 3 species based on planting dates shown above.
HERBACEOUS PLANT SEEDING TABLE 4
(Approved for Riparian Mitigation or for Seed Mixes on Slopes Steeper than 3:1- Requiring Permanent Planting)

<table>
<thead>
<tr>
<th>Common name</th>
<th>Botanical name</th>
<th>Class/type</th>
<th>Rate/Acre</th>
<th>Planting Zone</th>
<th>Planting Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe Pye Weed</td>
<td>Eupatorium fistulosum</td>
<td>Herbaceous Perennial</td>
<td>Minimum 2 (2)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Ironweed</td>
<td>Vernonia novaboracensis</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>March 1 - August 31,</td>
</tr>
<tr>
<td>White snakeroot</td>
<td>Ageratina altissima (Eupatorium rugosum)</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Swamp milkweed</td>
<td>Asclepias incarnata</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>March 1 - August 31,</td>
</tr>
<tr>
<td>Frost aster</td>
<td>Aster pilosus (Symphyotrichum)</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Partridge pea</td>
<td>Chamaecrista fasciculata</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Lance-leaf coreopsis</td>
<td>Coreopsis lanceolata</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Tall coreopsis</td>
<td>Coreopsis tripteris</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Boneset</td>
<td>Eupatorium perfoliatum</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Sneezeweed</td>
<td>Helenium autumnale</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Swamp sunflower</td>
<td>Helianthus angustifolius</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>March 1 - August 31,</td>
</tr>
<tr>
<td>Fringed loosestrife</td>
<td>Lysimachia ciliata</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Wild bergamot</td>
<td>Monarda fistulosa</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Mountain mint</td>
<td>Pycnanthemum tenuifolium</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Black-eyed susan</td>
<td>Rudbeckia hirta</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Goldenrod</td>
<td>Solidago nemoralis</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>September 1 – May 1</td>
</tr>
<tr>
<td>Butterfly Weed</td>
<td>Aesclepias tuberosa</td>
<td>Herbaceous Perennial</td>
<td>Up to 10(11)</td>
<td>1,2,3,4</td>
<td>March 1 - August 31,</td>
</tr>
</tbody>
</table>

For native restoration and riparian mitigation seed mix combinations, use Table 4 for approved native herbaceous seed types in combination with Table 3 of native grass seeds. Native restoration and riparian seed mixes should incorporate a mix of 60% native grass types (see Table 3) and 40% native herbaceous types (see Table 4) applied at a minimum rate total of 10 (11) lbs per acre (kg/hectare) for each combined mix.
TABLE 5: TEMPORARY GRASS - SPECIES, SEEDING RATES AND PLANTING DATES

<table>
<thead>
<tr>
<th>Species</th>
<th>Rates per 1000 sq. ft.</th>
<th>Rates per Acre</th>
<th>Planting Date By Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rye (Grain)</strong></td>
<td>3.9 lbs</td>
<td>168 lbs</td>
<td>8/1 - 11/30</td>
</tr>
<tr>
<td><strong>Ryegrass</strong></td>
<td>0.9 lbs</td>
<td>40 lbs</td>
<td>8/1 - 11/30</td>
</tr>
<tr>
<td><strong>Rye &amp; Annual Lespedeza</strong></td>
<td>0.6 lbs</td>
<td>28 lbs</td>
<td>3/1 - 4/1</td>
</tr>
<tr>
<td><strong>Weeping Lovegrass</strong></td>
<td>0.1 lbs</td>
<td>4 lbs</td>
<td>3/15 - 6/15</td>
</tr>
<tr>
<td><strong>Sudangrass</strong></td>
<td>1.0 lbs</td>
<td>60 lbs</td>
<td>4/1 - 8/31</td>
</tr>
<tr>
<td><strong>Browntop Millet</strong></td>
<td>1.1 lbs</td>
<td>50 lbs</td>
<td>4/1 - 6/30</td>
</tr>
<tr>
<td><strong>Wheat</strong></td>
<td>3.9 lbs</td>
<td>168 lbs</td>
<td>9/1 - 12/31</td>
</tr>
</tbody>
</table>

When stage construction or other conditions prevent completing a roadway section continuously, apply temporary grassing to control erosion. Temporary grassing is used to stabilize disturbed areas for more than sixty (60) calendar days. Temporary grass may be applied any time of the year, utilizing the appropriate seed species and application rate as shown in the chart above. Apply mulch to areas planted in temporary grass at the rate of ¾ inch to 1.5 inches. Do not place slope mats on areas planted in temporary grass.

A. **Ground Preparation**

Prepare the ground by plowing under any temporary grass areas and preparing the soil as follows:

1. **Slopes 3:1 or Flatter**
   - On slopes 3:1 or flatter, plow shoulders and embankment slopes to between 4 in and 6 in (100 mm and 150 mm) deep.
   - Plow front and back slopes in cuts to no less than 6 in (150 mm) deep. After plowing, thoroughly disk the area until pulverized to the plowed depth.

2. **Slopes Steeper Than 3:1**
   - Serrate slopes steeper than 3:1 according to Plan details when required.
   - On embankment slopes and cut slopes not requiring serration (sufficient as determined by the Engineer), prepare the ground to develop an adequate seed bed using any of the following methods as directed by the Engineer:
     - Plow to a depth whatever depth is practicable.
     - Use a spiked chain.
     - Walk with a cleated track dozer.
     - Scarify.
   - Disking cut slopes and fill slopes is not required.

3. **All Slopes**
   a. **Obstructions**
      - Remove boulders, stumps, large roots, large clods, and other objects that interfere with grassing or may slide into the ditch.
   b. **Topsoil**
      - Spread topsoil stockpiled during grading evenly over cut and fill slopes after preparing the ground.
      - Push topsoil from the top over serrated slopes. Do not operate equipment on the face of completed serrated cuts.
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   For Permanent Grassing in native restoration areas, multitrophic native planting areas, riparian areas, stream restoration areas, and wetland and stream mitigation areas, provide the minimum ground preparation necessary to provide seed to soil contact. Riparian areas may also be seeded using the no-till method. The no-till method is defined by planting permanent grass seeds using a drill-type seeder over existing vegetation without plowing or tilling soil. Ensure that existing vegetation is less than 3 inches in height (this may be achieved by mowing or using a mechanical string trimmer).

B. Grassing Adjacent to Existing Lawns
   When grassing areas adjacent to residential or commercial lawns, the Engineer shall change the plant material to match the type of grass growing on the adjacent lawn. The Contract Unit Price will not be modified for this substitution.

C. Temporary Grassing
   Apply temporary grassing according to Subsection 163.3.05.F. Determine lime requirements by a laboratory soil test. Refer to seeding Table 5 for species, amounts of seed and planting dates.
   In March or April of the year following planting and as soon as the weather is suitable, replace all areas of temporary grass with permanent grass by plowing or overseeding using the no-till method. If the no-till method is used, ensure that temporary grass is less than 3 inches in height (this may be achieved by mowing). Additional mulch will be required only if the temporary grass does not provide adequate mulch to meet the requirements of Subsection 700.3.05.G, “Mulching”.
   Temporary grass, when required, will be paid for according to Section 163.

D. Applying Agricultural Lime and Fertilizer Mixed Grade
   Apply and mix lime and fertilizer as follows:
   1. Agricultural Lime
      Uniformly spread agricultural lime on the ground at the approximate rate determined by the laboratory soil test.
      a. Agricultural Lime may be used as filler material in mixed grade fertilizer in lieu of inert material. The use of agricultural lime as filler material is to be shown on the fertilizer bag or invoice from the supplier. Do not deduct any amount of fertilizer when lime is used as filler.
   2. Fertilizer Mixed Grade
      Uniformly spread the fertilizer selected according to Subsection 700.2.D over the ground or by use of hydroseeding. For bid purposes base estimated quantities on an initial application of 400 lb/acre of 19-19-19.
   3. Mixing
      Before proceeding, uniformly work the lime and fertilizer into the top 4 in (100 mm) of soil using harrows, rotary tillers, or other equipment acceptable to the Engineer.
      On cut slopes steeper than 3:1, other than serrated slopes, reduce the mixing depth to the maximum practical depth as determined by the Engineer.
      Omit mixing on serrated slopes.
   4. Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas
      Omit the application of lime and fertilizer within riparian areas.

E. Seeding
   Prepare seed and sow as follows:
   1. Inoculation of Seed
      Inoculate each kind of leguminous seed separately with the appropriate commercial culture according to the manufacturer’s instructions for the culture.
      When hydroseeding, double the inoculation rate.
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Protect inoculated seed from the sun and plant it the same day it is inoculated.

2. Sowing
Weather permitting, sow seed within 24 hours after preparing the seed bed and applying the fertilizer and lime. Sow seed uniformly at the rates specified in the seeding tables. Use approved mechanical seed drills, rotary hand seeders, hydroseeding equipment, or other equipment to uniformly apply the seed. Do not distribute by hand. To distribute the seeds evenly sow seed types separately, except for similarly sized and weighted seeds. They may be mixed and sown together. Do not sow during windy weather, when the prepared surface is crusted, or when the ground is frozen, wet, or otherwise non-tillable.

3. Overseeding
Temporary grass areas that were prepared in accordance with Subsection 700.3.05.A, may be overseeded using the no-till method. The no-till method is defined by planting permanent grass seeds using a drill-type seeder over existing temporary grass without plowing or tilling soil and in accordance with Subsection 700.3.05.C.

4. Riparian Seed Mix shall be used when specified in the Plans. A mix of at least three (3) species from Seeding Table 3 (Native Grasses) and at least two (2) species from Seeding Table 4 (Approved Riparian Mitigation - Herbaceous Plants). The seed, shall be applied as Permanent Grassing within those areas designated on the Plans. The kinds of seed, shall be used according to the appropriate Planting Dates given in the tables.

F. Hydroseeding
Hydroseeding may be used on any grassing area. Under this method, spread the seed, fertilizer, and wood fiber mulch in the form of a slurry. Seeds of all sizes may be mixed together. Apply hydroseeding as follows:

1. Use wood fiber mulch as a metering agent and seed bed regardless of which mulching method is chosen. Apply wood fiber mulch at approximately 500 lbs/acre (560 kg/ha).
2. Prepare the ground for hydroseeding as for conventional seeding in Subsection 700.3.05.A.
3. Use specially designed equipment to mix and apply the slurry uniformly over the entire seeding area.
4. Agitate the slurry mixture during application.
5. Discharge slurry within one hour after being combined in the hydroseeder. Do not hydroseed when winds prevent an even application.
6. Closely follow the equipment manufacturer’s directions unless the Engineer modifies the application methods.
7. Mulch the entire hydroseeded area according to Subsection 700.3.05.F.1, above, and Subsection 700.3.05.G, below.

Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas may be hydroseeded. When hydroseeding in these areas only use water, seed and wood fiber mulch.

G. Mulching
Except as noted in Subsection 700.3.05.B and Subsection 700.3.05.C, apply mulch immediately after seeding areas as follows:

Areas with permanent grass seed and covered with slope mats or blankets will not require mulch.

Evenly apply straw or hay mulch between 3/4 in and 1-1/2 in (20 mm and 40 mm) deep, according to the texture and moisture content of the mulch material.

Mulch shall allow sunlight to penetrate and air to circulate as well as shade the ground, reduce erosion, and conserve soil moisture. If the type of mulch is not specified on the Plans or in the Proposal, use any of the following as specified.

1. Mulch with Tackifier
Apply mulch with tackifier regardless of whether using ground or hydroseeding equipment for seeding.
   a. Mulch uniformly applied manually or with special blower equipment designed for the purpose. When using a blower, thoroughly loosen baled material before feeding it into the machine so that it is broken up.
   b. After distributing the mulch initially, redistribute it to bare or inadequately covered areas in clumps dense enough to prevent new grass from emerging (if required).
      Do not apply mulch on windy days.
c. Apply enough tackifier to the mulch to hold it in place. Immediately replace mulch that blows away.
   If distributing the mulch by hand, immediately apply the tackifier uniformly over the mulched areas.
   • Tackifier: Use a tackifier listed in the Laboratory Qualified Products Manual and apply at the manufacturer’s recommended rates.

2. Walked-in-Mulch
   Apply walked-in-mulch on slopes ranging in steepness from 5:1 to 2:1 and treat as follows:
   a. Immediately walk it into the soil with a cleated track dozer. Make dozer passes vertically up and down the slope.
   b. Where walked-in-mulch is used, do not roll or cover the seeds as specified in Subsection 700.3.05.E.3.

3. Apply only wheat straw mulch on Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas after they have been seeded. The wheat straw mulch is to be applied with a maximum thickness of 1 inch.

H. Sod

Furnish and install sod in all areas shown on the Plans or designated by the Engineer.

1. Kinds of Sod
   Use only Common Bermudagrass (Cynodon dactylon) or one of the following Bermudagrass varieties:
   • Tifway 419
   • Tifway II
   • Tift 94
   • Tifton 10
   • Midlawn
   • Midiron
   • GN-1
   • Vamont

   No dwarf Bermuda types shall be used. Sod shall be nursery-grown and be accompanied with a Georgia Department of Agriculture Live Plant License Certificate or Stamp. Sod shall consist of live, dense, well-rooted material free of weeds and insects as described by the Georgia Live Plant Act.

2. Type And Size Of Sod:
   Furnish either big roll or block sod. Ensure that big roll sod is a minimum of 21 inches wide by 52 feet long.
   Minimum dimensions for block sod are 12 inches wide by 22 inches long. Ensure all sod consists of a uniform soil thickness of not less than 1 inch.

3. Ground Preparation
   Excavate the ground deep enough and prepare it according to Subsection 700.3.05.A to allow placing of sod. Spread soil, meeting the requirements of Subsection 893.2.01, on prepared area to a depth of 4 inches.

4. Application Of Lime and Fertilizer
   Apply lime and fertilizer according to Subsection 700.3.05.D within 24 hours prior to installing sod.

5. Weather Limitation
   Do not place sod on frozen ground or where snow may hinder establishment.

6. Install Sod
   Install Sod as follows:
   • Place sod by hand or by mechanical means so that joints are tightly abutted with no overlaps or gaps. Use soil to fill cracks between sod pieces, but do not smother the grass.
   • Stake sod placed in ditches or slopes steeper than 2:1 or any other areas where sod slipping can occur.
   • Use wood stakes that are at least 8 in (200 mm) in length and not more than 1 in (25 mm) wide.
   • Drive the stakes flush with the top of the sod. Use a minimum of 8 stakes per square yard (meter) to hold sod in place.
   • Once sod is placed and staked as necessary, tamp or roll it using adequate equipment to provide good contact with soil.
Section 700—Grassing

- Use caution to prevent tearing or displacement of sod during this process. Leave the finished surface of sodded areas smooth and uniform.

7. Watering Sod

After the sod has been placed and rolled or tamped, water it to promote satisfactory growth. Additional watering will be needed in the absence of rainfall and during the hot dry summer months. Water may be applied by Hydro Seeder, Water Truck or by other means approved by the Engineer.

8. Dormant Sod

Dormant Bermuda grass sod can be installed. However, assume responsibility for all sod through establishment and until final acceptance.

9. Establishment

Sod will be inspected by the Engineer at the end of the first spring after installation and at the time of Final Inspection. Replace any sod that is not live and growing. Any cost for replacing any unacceptable sod will be at the Contractor’s expense.

I. Application of Nitrogen

Apply nitrogen at approximately 50 lbs/acre (56 kg/ha) when specified by the Engineer after plants have grown to 2 inches (50 mm) in height.

One application is mandatory and must be applied before Final Acceptance.

Apply nitrogen with mechanical hand spreaders or other approved spreaders capable of uniformly covering the grassed areas. Do not apply nitrogen on windy days or when foliage is damp.

Do not apply nitrogen between October 15 and March 15 except in Zone 4.

1. Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas

Do not apply nitrogen to these areas.

J. Application of Polyacrylamide (PAM)

1. Prepare soil according to project Plans and Specifications prior to applying PAM.
2. Apply PAM according to manufacturer’s recommendations and the requirements listed herein.
3. Apply Polyacrylamide (PAM) to all areas that receive permanent grassing.
4. Apply PAM (powder) before grassing or PAM (emulsion) to the hydroseeding operation.
5. Use only anionic PAM.
6. Ensure that the application method provides uniform coverage to the target and avoids drift to non-target areas including waters of the state.
7. Achieve > 80% reduction in soil loss as measured by a rainfall simulator test performed by a certified laboratory (1 hour storm duration, 3 inches (75 mm) rainfall per hour).
8. Ensure uniform coverage to the target area and minimize drift to non-target areas. Apply anionic PAM to all cut and fill slopes, permanently grassed or temporarily grassed, either prior to grassing or in conjunction with hydroseeding operations. Mulch will not be eliminated.
9. Use application rates in accordance with manufacturer’s instructions.
10. Do not exceed 200 lbs/acre/year (224 kg/ha/year).
11. Do not include polyacrylamide when planting in Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas

700.3.06 Quality Acceptance

The Engineer may require replanting of an area that shows unsatisfactory growth for any reason at any time.

Except as otherwise specified or permitted by the Engineer, prepare replanting areas according to the Specifications as if they were the initial planting areas. Use a soil test or the Engineer’s guidance to determine the fertilizer type and application rate, then furnish and apply the fertilizer.
700.3.07 Contractor Warranty and Maintenance

A. Plant Establishment

Before Final Acceptance, provide plant establishment of the specified vegetation as follows:

1. Plant Establishment
   Preserve, protect, water, reseed or replant, and perform other work as necessary to keep the grassed areas in satisfactory condition.

2. Watering
   Water the areas during this period as necessary to promote maximum growth.

3. Mowing
   Mow seeded areas of medians, shoulders, and front slopes at least every 6 months. Avoid damaging desirable vegetation.
   In addition, mow as necessary to prevent tall grass from obstructing signs, delineation, traffic movements, sight distance, or otherwise becoming a hazard to motorists.
   Do not mow lespedezas or tall fescue until after the plants have gone to seed.

4. Do not mow riparian areas, stream restoration areas, or wetland and stream mitigation areas after planting.

B. Additional Fertilizer Mixed Grade

Apply fertilizer based on the initial soil test report at half the recommended rate each spring after initial plant establishment. For bid purposes apply 200 lbs/acre of 19-19-19. Continue annual applications until Final Acceptance. This additional fertilizer will be measured and paid for at the Contract Unit Price for fertilizer mixed grade.

Do not apply additional fertilizer to Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas.

C. Growth and Coverage

Provide satisfactory growth and coverage, ensuring that vegetation growth is satisfactory with no bare spots larger than 1 ft² (0.1 m²). Bare spots shall comprise no more than 1 percent of any given area. An exception is given for seed not expected to have germinated and shown growth at that time.

D. Permissible Modifications

When all Items of the work are ready for Final Acceptance except for newly planted repaired areas or other areas with insufficient grass, the Contractor may fill the eroded areas or treat bare areas with sod obtained, placed, and handled according to Subsection 700.3.05.H.

Carefully maintain the line and grade established for shoulders, front slopes, medians, and other critical areas.

Sod as described above will not be paid for separately, but will be an acceptable substitute for the satisfactory growth and coverage required under this Specification. These areas treated with sod are measured for payment under the Item for which the sod is substituted.

700.4 Measurement

A. Permanent Grassing

Permanent Grassing will be measured for payment by the acre (hectare).

B. Mulches

Straw or hay mulch applied to permanent grassing areas will be measured by the ton (megagram). Wood fiber mulch furnished by the Contractor for permanent grassing is not measured for separate payment.

C. Quantity of Sod

Sod is measured for payment by the number of square yards (meters) surface measure, completed and accepted.

D. Water

Water furnished and applied to promote a satisfactory growth is not measured for payment.
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E. Quantity of Lime and Fertilizer Mixed Grade

Lime and fertilizer are measured by the ton (megagram). Lime used as a filler in fertilizer is measured by the ton (megagram).

F. Quantity of Nitrogen Used for Permanent Grassing

Nitrogen is measured in pounds (kilograms) based on the weight of fertilizer used and its nitrogen content.

G. Replanting and Plant Establishments

No measurement for payment is made for any materials or work required under Subsection 700.3.06 and Subsection 700.3.07.

H. Temporary Grass

Temporary grass is measured for payment by the acre (hectare) according to Section 163.

I. Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas

Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian areas, Stream Restoration area, and Wetland and Stream Mitigation areas will be measured by the acre (hectare) and included under the pay item “Native Restoration and Riparian Seeding”.

700.4.01 Limits

General Provisions 101 through 150.

700.5 Payment

As grassing and planting progress, the Contractor will receive full measurement and payment on regular monthly estimates provided the work complies with the Specifications.

A. Permanent Grassing

Permanent grassing will be paid for at the Contract Price per acre (hectare), complete and in place. Payment is full compensation for preparing the ground, seeding, wood fiber mulch, polyacrylamide, and providing plant establishment, soil tests and other incidentals.

B. Straw or Hay Mulch

Straw or hay mulch required for Permanent Grassing will be paid for according to Section 163.

C. Fertilizer Mixed Grade

Fertilizer mixed grade will be paid for at the Contract Price per ton (megagram). Payment is full compensation for furnishing and applying the material.

D. Lime

Lime will be paid for at the Contract Price per ton (megagram). Lime used as filler in fertilizer will be paid for per ton (megagram). Payment is full compensation for furnishing and applying the material.

E. Nitrogen

Nitrogen will be paid for at the Contract Price per pound (kilogram) of nitrogen content. Payment is full compensation for furnishing and applying the material.

F. Sod

Sod will be paid by the square yard (meter) in accordance with the following schedule of payments. Payment is full compensation for ground preparation, including addition of topsoil, furnishing and installing live sod, and for Plant Establishment.

1. 70% of the Contract Price per square yard will be paid at the satisfactory completion of the installation.
Section 700—Grassing

2. 20% of the Contract Price will be paid upon satisfactory review of sod which is healthy, weed free and viable at the inspection made at the end of the first spring after installation.

3. 10% of the contract price will be paid upon satisfactory review of sod that is healthy, weed free and viable at the Final Acceptance.

G. Temporary Grass

Temporary Grass will be paid for under Section 163.

H. Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian Areas, Stream Restoration Areas, and Wetland and Stream Mitigation Areas

Seeded Native Restoration Areas, Multitropic Native Planting Areas, Riparian areas, Stream Restoration area, and Wetland and Stream Mitigation areas will be paid for at the Contract Price per acre (hectare), complete and in place. Payment is full compensation for preparing the ground, seeding, and providing plant establishment and other incidentals, and included under the pay item “Native Restoration and Riparian Seeding”.

Payment will be made under:

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<tr>
<th>Item No. 700</th>
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<td>Item No. 700</td>
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<td>Per acre (hectare)</td>
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700.01 Adjustments

General Provisions 101 through 150.