

**B-3607****Project Special Provisions  
Erosion Control****Ashe County****Seeding And Mulching****(6)**

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined by the Engineer. All rates are in pounds per acre (kilograms per hectare).

## August 1 - June 1

100# (110kg) Tall Fescue  
 15# (17kg) Kentucky Bluegrass  
 15# (17kg) Hard Fescue  
 500# (560kg) Fertilizer  
 4000# (4500kg) Limestone

## May 1 - September 1

100# (110kg) Tall Fescue  
 15# (17kg) Kentucky Bluegrass  
 15# (17kg) Hard Fescue  
 25# (28kg) Kobe or Korean Lespedeza  
 500# (560kg) Fertilizer  
 4000# (4500kg) Limestone

## Approved Tall Fescue Cultivars:

Adventure	Adventure II	Amigo	Anthem
Apache	Apache II	Arid	Austin
Brookstone	Bonanza	Bonanza II	Chapel Hill
Chesapeake	Chieftain	Coronado	Crossfire II
Debutante	Duster	Falcon	Falcon II
Finelawn Petite	Finelawn	Finelawn I	Genesis
Grande	Guardian	Houndog	Jaguar
Jaguar III	Kentucky 31	Kitty Hawk	Monarch
Montauk	Mustang	Olympic	Pacer
Phoenix	Pixie	Pyramid	Rebel
Rebel Jr.	Rebel II	Renegade	Safari
Shenandoah	Tempo	Titan	Tomahawk
Trailblazer	Tribute	Vegas	Wolfpack
Wrangler			

## Approved Kentucky Bluegrass Cultivars:

Adelphi	Baron	Bristol	Challenger
Columbia	Fylking	Glade	Kenblue
Merit	Plush	Ram I	Rugby
Sydsport	Touchdown	Vantage	

## Approved Hard Fescue Cultivars:

Aurora	Bardur	Crystal	Reliant	Scaldis
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Spartan

Valda

Waldina

Warwick

On cut and fill slopes 2:1 or steeper add 25# (28kg) Rye Grain November 1 - March 1.

On cut and fill slopes 2:1 or steeper add 30# (35 kg) Sericea Lespedeza January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

**Temporary Seeding:**

Fertilizer shall be the same analysis as specified for "Seeding and Mulching" and applied at the rate of 400 pounds (450kg) and seeded at the rate of 50 pounds per acre (55kg per hectare). Kobe or Korean Lespedeza, German Millet, or Browntop Millet shall be used in summer months and rye grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

**Fertilizer Topdressing:**

Fertilizer used for topdressing shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre (560 kg per hectare). Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

**Supplemental Seeding:**

The kinds of seed and proportions shall be the same as specified for "Seeding and Mulching", and the rate of application may vary from 25# to 75# per acre (28kg to 85kg per hectare). The actual rate per acre (hectare) will be determined by the Engineer prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre (hectare), total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

**Mowing:**

The minimum mowing height on this project shall be six inches (150 mm).

**Lawn Type Appearance**

All areas adjacent to lawns must be hand finished as directed by the Engineer to give a "lawn type appearance". Remove all trash, debris, and stones  $\frac{3}{4}$  inch (19 mm) and larger in diameter or other obstructions that could interfere with providing a smooth "lawn type

appearance". These areas shall be reseeded to match their original vegetative conditions, unless directed otherwise by the Field Operations Engineer.

**Specialized Hand Mowing:**

The work covered by this section consists of specialized hand mowing around or under fixed objects, including but not limited to guardrails, signs, barriers and slopes in a method acceptable to the Engineer.

The work of specialized hand mowing shall be completed with mechanically powered trimmers, string trimmers, hand operated rotary mowers, or self-propelled mowers of sufficient size and quality to perform the work timely and efficiently.

The quantity of mowing to be performed will be affected by the actual conditions which occur during the construction of the project. The quantity of mowing may be increased, decreased or eliminated entirely at the direction of the Engineer. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

The quantity of specialized hand mowing to be paid for will be the actual number of man hours worked while hand mowing along the surface of the ground, at the direction of the Engineer. Where an area has been mowed more than once, at the direction of the Engineer, separate measurement will be made each time the area is mowed.

Payment will be made under:

Specialized Hand Mowing ..... HR

**Environmentally Sensitive Areas:**

This project is located in an "Environmentally Sensitive Area". This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the area identified on the plans. This also requires special procedures to be used for seeding and mulching and staged seeding within the project.

**Clearing and Grubbing:**

In areas identified on the erosion control plans as "Environmentally Sensitive Areas", the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Section 200, Article 200-1, in the Standard Specifications. The "Environmentally Sensitive Area" shall be defined as a 50 foot (16 meter) buffer zone on both sides of the stream (or depression), measured from top of streambank, (or center of depression). Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

**Grading:**

Once grading operations begin in identified "Environmentally Sensitive Areas", work will progress in a continuous manner until complete. All construction within these areas must progress in a continuous manner such that each phase is complete and areas permanently stabilized prior to beginning of next phase. Failure on the part of the Contractor to complete any phase of construction in a continuous manner in "Environmentally Sensitive Areas" as specified will be just cause for the Engineer to direct the suspension of work in accordance with Section 108-7 of the Standard Specifications.

**Temporary Stream Crossings:**

Any crossing of streams within the limits of this project must be accomplished in accordance with Section 107-13(b) of the Standard Specifications.

**Seeding and Mulching:**

Seeding and mulching shall be performed in accordance with Section 1660 of the Standard Specifications and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment.

Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the "Environmentally Sensitive Areas" as indicated on the E.C. Plans.

**Stage Seeding:**

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes which are greater than 20 feet (6 meters) in height or greater than 2 acres (0.8 hectares) in area. Each stage shall not exceed the limits stated above.

All work described above will be paid for at the contract unit prices established in the contract for the work involved. Additional payments will not be made for the requirements of this section as the cost for this work should be included in the contract unit prices for the work involved.

**Minimize Removal Of Vegetation**

The Contractor shall minimize removal of vegetation at stream banks and disturbed areas within the project limits as directed by the Engineer.

**Stockpile Areas**

The Contractor shall install and maintain erosion control devices sufficient to contain sediment around any erodible material stockpile areas as directed by the Engineer.

**Streambank Reforestation:**

Streambank reforestation will be planted in areas designated on the plans and as directed by the Engineer. See the streambank reforestation detail sheet.

Type I Streambank Reforestation shall be live stakes, planted along both streambanks.

Coir fiber mat shall be installed on the streambanks where live staking is to be planted as shown on the streambank reforestation detail sheet and in locations as directed by the Engineer. Work includes providing all materials, excavating and backfilling, and placing and securing coir fiber mat.

Provide matting to meet the following requirements:

- 100 % coconut fiber (coir) twine woven into a high strength matrix.
- Thickness - 0.30 in. minimum. (7.6 mm)
- Tensile Strength - 1348 x 626 lb/ft minimum (1650.5 x 766.5 kg/m)
- Elongation - 34% x 38% maximum
- Flexibility (mg-cm)- 65030 x 29590
- Flow Velocity- Observed 11 ft/sec (3.35 m/s)
- Weight - 20 oz/SY (678 g/SM)
- Size - 6.6 x 164 ft (120 SY) or (100 SM)
- “C” Factor - 0.002
- Open Area (measured) - 50%

Provide wooden stakes 12 in. (300 mm) in length with a notch cut 1 in. (25 mm) from top.

Place the matting immediately upon final grading. Provide a smooth soil surface free from stones, clods, or debris which will prevent the contact of the matting with the soil. Take care to preserve the required line, grade, and cross section of the area covered.

Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Bury the top slope end of each piece of matting in a narrow trench at least 6 in. (150 mm) deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6 in. (150 mm) overlap. Construct check trenches at least 12 in. (0.3 m) deep every 50 ft. (16 m) longitudinally along the edges of the matting or as directed by the Engineer. Fold over and bury matting to the full depth of the trench, close and tamp firmly. Overlap matting at least 6 in. (150 mm) where 2 or more widths of matting are installed side by side.

Place stakes across the matting at ends, junctions, and check trenches approximately 1 ft. (0.3 m) apart with notch facing upslope.

Place stakes along the outer edges and down the center of each strip of matting 3 feet (1 meter) apart. Place stakes along all lapped edges 1 ft. (0.3 m) apart. Refer to details in the plan sheets.

The Engineer may require adjustments in the trenching or staking requirements to fit individual site conditions.

Live staking plant material shall consist of a random mix made up of 50% Black Willow (*Salix nigra*), 50% Silky Dogwood (*Cornus amomum*). Other species may be substituted upon approval of Engineer.

All plant material shall be harvested locally (within the same physiographic ecoregion and plant hardiness zone) or purchased from a local nursery, with the approval of the Engineer. All live stakes shall be dormant at time of acquisition and planting.

Live stakes shall be 1/2-2 inches (12-50 mm) in diameter. Stakes shall also be 2-3 feet (0.6-1 meter) in length.

During preparation, the basal ends of the live stakes shall be cleanly cut at an angle to facilitate easy insertion into the soil, while the tops shall be cut square or blunt for tamping. All limbs shall be removed from the sides of the live cutting prior to installation.

Live stakes shall be installed within 48 hours of cutting. Outside storage locations should be continually shaded and protected from wind and direct sunlight. Live cut plant material shall remain moist at all times before planting.

Install live stakes according to the streambank reforestation detail sheet.

Tamp live stakes perpendicularly into the finished bank slope with a dead blow hammer, with buds oriented in an upward direction. Stakes should be tamped until approximately  $\frac{3}{4}$  of the stake length is within the ground.

The area around each live stake shall be compacted by foot after the live stake has been installed.

Stakes shall be spaced approximately 4 feet (1.2 meters) on center. Live stakes should be installed according to the configuration presented in the details of the plan sheets.

One to two inches shall be cut cleanly off of the top of each live stake (with loppers) at an angle of approximately 15 degrees following installation.

Any stakes that are split or damaged during installation shall be removed and replaced.

Type II Streambank Reforestation shall be bare root seedlings. The seedlings shall be planted as soon as practical following permanent seeding and mulching. The seedlings shall be planted from top of bank out, along both sides of stream, as designated on the plans.

Seedlings shall be 12–18 inches (300-460mm) tall.

Root dip: The roots of reforestation seedlings shall be coated with a slurry of water, and either a fine clay ("kaolin") or a superabsorbent that is made to be used as a bare root dip. The type, mixture ratio, method of application, and the time of application shall be submitted to the Engineer for approval.

With the approval of the Engineer, seedlings may be coated before delivery to the job or at the time of planting, but at no time shall the roots of the seedlings be allowed to dry out. The roots shall be moistened immediately prior to planting.

Seasonal Limitations: Streambank reforestation shall be planted from November 15 through March 15.

Measurement:

The quantity of streambank reforestation to be paid for will be the actual number of acres (hectares) of land, measured along of the surface of ground, which has been acceptably planted with seedlings in accordance with these specifications.

Payment:

The quantity of streambank reforestation will be paid for at the contract unit price per acre (hectare) for "Streambank Reforestation".

Payment will be made under:

Streambank Reforestation..... ACR (HA)

**Waste Areas And Borrow Sources:**

Payment for temporary erosion control measures, except those made necessary by the Contractor's own negligence or for his own convenience, will be paid for at the appropriate contract unit price for the devices or measures utilized in borrow sources and waste areas.

No additional payment will be made for erosion control devices or permanent seeding and mulching in any commercial borrow or waste pit. All erosion and sediment control practices which may be required on a commercial borrow or waste site will be done at the Contractor's expense.

**Gravel Construction Entrance:****Description:**

The work covered by this section consists of furnishing, installing, and maintaining and removing any and all material required for the construction of a Gravel Construction Entrance.

**Materials:**

The filter fabric shall meet the requirements of Section 1056 for Type 2 Fabric.

Stone shall be Class A Stone and shall meet the requirements of Section 1042 for Stone for Erosion Control, Class A.

**Construction:**

The Contractor shall install a Gravel Construction Entrance in accordance with the details in the plans and at locations as directed by the Engineer.

**Method Of Measurement:**

Gravel Construction Entrance will not be measured for payment under this section.

**Basis Of Payment:**

Payment for installation of Filter Fabric shall be paid for at the contract unit price per square yard (square meter) "Filter Fabric for Drainage".

Payment for installation of Class A Stone shall be paid for at the contract unit price per ton (metric ton) "Stone for Erosion Control, Class A".

Such price and payment shall be considered full compensation for all work covered by this provision including all materials, construction, maintenance, and removal of Gravel Construction Entrance as directed by the Engineer.



**WATER FILLED BARRIER**

**DESCRIPTION.**

Furnish, install, secure, maintain, remove, and reset Water Filled Barrier. In addition, provide an environmentally safe anti-freezing agent when required, in accordance with the plans and specifications.

**MATERIALS.**

(A) General:

Provide Water Filled Barrier that meets or exceed the requirements of NCHRP 350 Test Level II for work zones which have a posted speed limit of 45 mph (72 km/h) or less. Provide Water Filled Barrier that acts as it's own free standing, non-redirective end treatment

(B) Material Qualifications:

Use Water Filled Barrier which is on the North Carolina Department of Transportation's Approved Products List or is Traffic-qualified by the Traffic Control Section. For more information on the Traffic-qualification process, contact the Traffic Control Section at Century Center Building B, 1020 Birch Ridge Dr., Raleigh, NC, 27610 (919) 250-4151, or see the approved product list on NCDOT web site at:  
"[www.doh.dot.state.nc.us/preconstruct/traffic/congestion/tc/](http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/tc/)".

(C) Historical Performance:

Historical performance of the Water Filled Barrier will be used in determining future use of the material by the NCDOT, even if the Water Filled Barrier has been traffic-qualified. Poor past or poor current performance of Water Filled Barrier at any site, whether or not related to a specific contract may be grounds for non-acceptance of a product on any project under contract.

**CONSTRUCTION METHODS.**

Place and install Water Filled Barrier only on roadways with posted speed limits of 45 mph (72 km/h) or less.

Place and install Water Filled Barrier units as shown in the plans and per manufacturer specifications.

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Use environmentally safe anti-freezing agent in the water per manufacturer specifications and recover agent when the barrier is drained.

Do not drain Water Filled Barrier into or across an existing travel lane. Provide barrier units that are capable of being lifted and moved when filled if draining is not possible.

Furnish delineators for Water Filled Barrier which meet the requirements of Section 1088-2 and Section 1170-3, (E) of the 2002 Standard Specifications.

**MAINTENANCE.**

Maintain Water Filled Barrier in accordance with Section 1105-4 of the 2002 Standard Specifications.

**METHOD OF MEASUREMENT.**

The method of measurement will be in accordance with Section 1170-05 of the 2002 Standard Specifications.

There will be no measurement made of barrier delineators as they are considered incidental to the other pay items in this special provision.

**BASIS OF PAYMENT.**

The quantity of Water Filled Barrier, measured as provided above, will be paid at the contract unit price per linear foot (linear meter) for "Water Filled Barrier".

The quantity of resetting Water Filled Barrier, measured as provided above, will be paid at the contract unit price per linear foot (linear meter) for "Reset Water Filled Barrier".

There will be no direct payment for barrier delineators as they are considered incidental to the other pay items in this special provision.

Payment will be made under:

Water Filled Barrier .....	Linear Foot (Linear Meter)
Reset Water Filled Barrier .....	Linear Foot (Linear Meter)