

**B-3662 and  
B-3665****Project Special Provisions  
Erosion Control****Henderson County****Seeding and Mulching:**

(WestEd)

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).

## Shoulder and Median Areas:

August 1 - June 1

May 1 - September 1

|                               |                                      |
|-------------------------------|--------------------------------------|
| 20# (23kg) Kentucky Bluegrass | 20# (23kg) Kentucky Bluegrass        |
| 75# (85kg) Hard Fescue        | 75# (85kg) Hard Fescue               |
| 25# (28kg) Rye Grain          | 10# (12kg) German or Browntop Millet |
| 500# (560kg) Fertilizer       | 500# (560kg) Fertilizer              |
| 4000# (4500kg) Limestone      | 4000# (4500kg) Limestone             |

## Areas Beyond the Mowing Pattern, Waste and Borrow Areas:

August 1 - June 1

May 1 - September 1

|                               |                                      |
|-------------------------------|--------------------------------------|
| 100# (110kg) Tall Fescue      | 100# (110kg) Tall Fescue             |
| 15# (17kg) Kentucky Bluegrass | 15# (17kg) Kentucky Bluegrass        |
| 30# (34kg) Hard Fescue        | 30# (34kg) Hard Fescue               |
| 25# (28kg) Rye Grain          | 10# (12kg) German or Browntop Millet |
| 500# (560kg) Fertilizer       | 500# (560kg) Fertilizer              |
| 4000# (4500kg) Limestone      | 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 |
| Spartan | Valda  | Waldina | Warwick |         |

On cut and fill slopes 2:1 or steeper add 20# (23kg) Sericea Lespedeza and 15# (17kg) Crown Vetch January 1 - December 31.

The Crown Vetch Seed should be double inoculated if applied with a hand seeder. Four times the normal rate of inoculant should be used if applied with a hydroseeder. If a fertilizer-seed slurry is used, the required limestone should also be included to prevent fertilizer acidity from killing the inoculant bacteria. Caution should be used to keep the inoculant below 80° F to prevent harm to the bacteria. The rates and grades of fertilizer and limestone shall be the same as specified for permanent seeding and mulching in the special provisions.

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.

**Native Grass Seeding And Mulching**

**Bluegrass**

Native Grass Seeding and Mulching shall be performed on the disturbed areas of wetlands, and adjacent to Stream Relocation and/or Trout Stream construction within a 50 foot (16 meter) zone on both sides of the stream(or depression), measured from top of stream bank, (or center of depression). The stream bank of the Stream Relocation shall be seeded by a method that does not alter the typical cross section of the stream bank. Native Grass Seeding and Mulching shall also be performed in the Permanent Soil Reinforcement Mat section of Preformed Scour Holes, and in other areas as directed by the Engineer.

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

May 1 - September 1

- 25# (28kg) Kentucky Bluegrass
- 8# (9kg) Big Bluestem
- 6# (7kg) Indiangrass
- 4#(5kg) Switchgrass
- 35#(39kg) Rye Grain
- 500# (560kg) Fertilizer
- 4000# (4500kg) Limestone

- 25# (28kg) Kentucky Bluegrass
- 8# (9kg) Big Bluestem
- 6# (7kg) Indiangrass
- 4#(5kg) Switchgrass
- 25#(28kg) German or Browntop Millet
- 500# (560kg) Fertilizer
- 4000# (4500kg) Limestone

Approved Kentucky Bluegrass Cultivars:

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

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.

Native Grass 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.

Payment for Native Grass Seeding and Mulching shall be made under:

Seeding and  
 Mulching.....Acre(Hectare)

**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). 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 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

**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.

**Reforestation:**

Reforestation will be planted where the existing roadway is removed, and in areas designated by the Engineer. Reforestation is not shown on the plan sheets. See the reforestation detail sheet.

The entire Reforestation operation shall comply with section 1670 of the Standard Specifications.

Seasonal limitations: Seedlings shall be planted from November 15 through March 15.

Seedlings shall be planted as soon as practical following permanent Seeding and Mulching. Seedlings shall be planted in a 16 ft. (5 meters) wide swath adjacent to mowing pattern line.

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.

**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.

**Temporary Diversion:**

The work by this section for installation, maintenance, and cleanout of temporary diversions shall be in accordance with Section 1630. The quantity of excavation for installation and cleanout measured as provided in Article 1630-4 will be paid for at the contract unit price per cubic yard (cubic meter) as provided in Article 1630-5 for "Silt Excavation".

**Safety Fence:**

## Description:

The work of "Safety Fence" shall consist of furnishing, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland or water, and as directed by the Engineer in accordance with the special provisions included herein. The fence shall be installed prior to any land disturbing activities.

## Materials:

## Fence Material:

Polyethylene or polypropylene fence shall be a preconstructed safety fence approved by the Engineer.

## Posts:

Either wood posts or steel posts may be used. Wood posts shall be nominal 2" x 4" (51 mm x 102 mm) or 4" x 4" (102 mm x 102 mm), lengths as required, structural light framing, grade No. 2, Southern Pine. Steel posts shall be at least 5 feet (1.6 m) in length, approximately 1 3/8" (35 mm) wide measured parallel to the fence, and have a minimum weight of 1.25 lb./ft. (1.9 kg/m) of length. The steel post shall be equipped with an anchor plate having a minimum area of 14 square inches (90 square centimeters).

## Clearing and Grading:

No additional clearing and grubbing is anticipated for the installation of this fence; however, if any clearing and grubbing is required, it will be the minimum required for the installation of the safety fence. Such clearing shall include satisfactory removal and disposal of all trees, brush, stumps and other objectionable material.

The fence shall be erected to conform to the general contour of the ground. When determined necessary by the Engineer, minor grading along the fence line shall be done to meet this requirement provided no obstructions to proper drainage are created.

Installation:

Posts shall be set and maintained in a vertical position and may be hand set or set with a post driver. If hand set, all backfill material shall be thoroughly tamped. If power driven, wood posts may be sharpened to a dull point. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30 degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence fabric shall be attached to the wood posts with one 2" (51 mm) galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

Method of Measurement:

The quantity of safety fence to be paid for shall be the actual number of linear feet (meter) of "Safety Fence", installed in place and accepted. No direct payment will be made for post and post bracing. Cost shall be included in the cost of the fence per linear foot (meter).

Basis of Payment:

The quantity of safety fence measured as provided above will be paid for at the contract unit price per linear foot (meter) of safety fence. Such payment will be full compensation for the work as described in the above paragraphs, including but not limited to clearing and grading, furnishing and installing fence fabric with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Safety Fence.....LF (M)

**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.

**Culvert Diversion Channel:**

**Description:**

Provide a culvert diversion channel to detour existing stream around the culvert construction site at locations shown on the plans. Work includes constructing diversion channel, disposing of excess materials, providing and placing filter fabric liner, maintaining diversion area in an acceptable condition, removing filter fabric liner, backfilling diversion channel area with suitable material and providing proper drainage when diversion channel area is abandoned.

**Material:**

Use local material or material specified on plans.

Provide filter fabric to meet requirements of Section 1056 for Type 2 fabric.

**Construction requirements:**

Grade channel according to plan with channel surface free of obstructions, debris, and pockets of low density material.

Utilize suitable material and provide disposal area for unsuitable material.



Line channel with fabric unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury top of slope fabric edge in a trench at least five inches (125mm) deep and tamp.

Make vertical overlaps a minimum of eighteen inches (450mm) with upstream fabric overlapping the downstream fabric.

Secure fabric with eleven gauge (3.05mm) wire staples shaped into a "u" shape with a length of not less than six inches (150mm) and a throat not less than one inch (25mm) in width. Place staples along outer edges and throughout the fabric a maximum of three feet (one meter) horizontally and vertically.

Method of Measurement:

Measurement of excavation will be made by the cubic yard (cubic meter) of excavation as calculated from the typical section throughout the length of the diversion channel as shown on the final approved plans.

Measurement of filter fabric will be made by the number of square yards (square meters) as measured over the surface of the ground over which filter fabric has been acceptably placed.

No measurement will be made for other items or for over excavation or stockpiling.

Basis of Payment:

Payment will be made for the quantities as measured above under the items listed below:

Culvert Diversion Channel ..... CY (M3)

Filter Fabric for Drainage ..... SY (M2)

**Impervious Dike:**

The work covered by this section consists of furnishing, installing, maintaining, and removing an impervious dike for the purpose of diverting normal stream flow around the construction site. The Contractor shall construct an impervious dike in such a manner approved by the Engineer. The impervious dike shall not permit seepage of water into the construction site or contribute to siltation of the stream. The impervious dike shall be constructed of an acceptable material in the locations noted on the plans or as directed by the Engineer.

Acceptable materials shall include but not be limited to sheet piles, sandbags, and/or the placement of an acceptable size stone lined with polypropylene or other impervious fabric.

Earth material shall not be used to construct an impervious dike when it is in direct contact with the stream unless vegetation can be established before contact with the stream takes place.

The quantity of impervious dike to be paid for will be the actual number of linear feet (meters) of impervious dike(s) constructed, measured in place from end to end of each separate installation which has been completed and accepted.

The quantity of impervious dikes measured as provided above will be paid for at the contract unit price per linear foot (meter) for "Impervious Dike".

The above prices and payments will be full compensation for all work covered by this section including but not limited to furnishing all of the materials in the impervious dike, construction, maintenance, and removal of the impervious dike.