

U-2306A

**Project Special Provisions
Erosion Control**

Catawba County

SEEDING AND MULCHING:

(West)

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. All rates are in pounds per acre (kilograms per hectare).

Shoulder and Median Areas

August 1 - June 1

20# (23kg)	Kentucky Bluegrass
75# (85kg)	Hard Fescue
25# (28kg)	Rye Grain
500# (560kg)	Fertilizer
4000# (4500kg)	Limestone

May 1 - September 1

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

Areas Beyond the Mowing Pattern, Waste and Borrow Areas:

August 1 - June 1

100# (110kg)	Tall Fescue
15# (17kg)	Kentucky Bluegrass
30# (34kg)	Hard Fescue
25# (28kg)	Rye Grain
500# (560kg)	Fertilizer
4000# (4500kg)	Limestone

May 1 - September 1

100# (110kg)	Tall Fescue
15# (17kg)	Kentucky Bluegrass
30# (34kg)	Hard Fescue
10# (12kg)	German or Browntop Millet
500# (560kg)	Fertilizer
4000# (4500kg)	Limestone

Approved Tall Fescue Cultivars

Adventure	Brookstone	Guardian	Red Coat
Adventure II	Bonanza	Houndog	Renegade
Airlie	Bonanza II	Inferno	Safari
Amigo	Bulldog 51	Jaguar	Shelby
Anthem	Chapel Hill	Jaguar III	Shenandoah
Anthem II	Chesapeake	Kentucky 31	Southern Choice II
Apache	Chieftain	Kitty Hawk	South Paw
Apache II	Coronado	Monarch	Tempo
Arid	Crossfire II	Montauk	Titan
Arid II	Debutante	Mustang	Tomahawk
Arid III	Duster	Olympic	Tacer
Aztec II	Falcon	Pacer	Trailblazer
Barfexas	Falcon III	Pixie	Tribute
Barfexas II	Finelawn	Pyramid	Wolfpack
Barrera	Finelawn I	Quest	Wrangler
Barrington	Finelawn Petite	Rebel	
Bingo	Genesis	Rebel Jr	
Bravo	Grande	Rebel II	

Approved Kentucky Bluegrass Cultivars:

Adelphi	Brilliant	Kenblue	Princeton
Apollo	Bristol	Liberator	Ram I
Bariris	Challenger	Merit	Rugby
Baron	Columbia	Nuglade	Sydsport
Baronie	Fylking	Odyssey	Touchdown
Bartitia	Glade	Plush	Vantage

Approved Hard Fescue Cultivars:

Aurora	Nordic	Spartan	Warwick
Bardur	Reliant	Valda	
Crystal	Scaldis	Waldina	

On cut and fill slopes 2:1 or steeper add 20# (23kg) 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). 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 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 (152 mm).

LAWN TYPE APPEARANCE:

All areas adjacent to lawns must be hand finished as directed to give a lawn type appearance. Remove all trash, debris, and stones $\frac{3}{4}$ " (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:

Description

This work 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.

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 that occur during the construction of the project. The quantity of mowing may be increased, decreased or eliminated entirely as directed. Such variations in quantity will not be considered as alterations in the details of construction or a change in the character of the work.

Measurement and Payment

Specialized Hand Mowing will be measured and paid for as the actual number of hours worked while hand mowing along the surface of the ground, as directed. Where an area has been mowed more than once, as directed, separate measurement will be made each time the area is mowed.

Payment will be made under:

Pay Item	Pay Unit
Specialized Hand Mowing	Hour

RESPONSE FOR EROSION CONTROL:

The 2002 *Standard Specifications* are revised as follows:

Page 16-40, Section 1675,
Delete Section 1675 and insert the following:

1675-1 Description

Furnish the labor, materials, tools and equipment necessary to move personnel, equipment, and supplies to the project necessary for the pursuit of any or all of the following work as shown herein, by an approved subcontractor.

- (A) Seeding and Mulching
- (B) Temporary Seeding and Mulching
- (C) Temporary Mulching
- (D) Fertilizer Topdressing
- (E) Repair Seeding
- (F) Supplemental Seeding
- (G) Silt Fence Installation or Repair
- (H) Installation of Matting for Erosion Control

1675-2 Construction Methods

Provide an approved subcontractor who performs an erosion control action as described in Form 1675. Each erosion control action may include one or more of the above work items.

1675-3 Measurement and Payment

Response for Erosion Control will be measured and paid for by counting the actual number of times the subcontractor moves onto the project, including borrow and waste sites, and satisfactorily completes an erosion control action described in Form 1675. The provisions of Article 104-5 of the *Standard Specifications* will not apply to this item of work.

Payment will be made under:

Pay Item	Pay Unit
Response for Erosion Control	Each

MINIMIZE REMOVAL OF VEGETATION:

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

STOCKPILE AREAS:

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

WASTE 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 that may be required on a commercial borrow or waste site will be done at the Contractor's expense.

GRAVEL CONSTRUCTION ENTRANCE:**Description**

This work consists of furnishing, installing, and maintaining and removing any and all material required for the construction of a *Gravel Construction Entrance*.

Materials

Refer to Division 10

Item	Section
Filter Fabric for Drainage, Type 2	1056
Stone for Erosion Control, Class A	1042

Construction Methods

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

Measurement and Payment

Filter Fabric for Drainage will be measured and paid for in accordance with Subarticles 876-5(C) and 876-6(C) of the *Standard Specifications*.

Stone for Erosion Control, Class __ will be measured and paid for in accordance with Articles 1610-4 and 1610-5 of the *Standard Specifications*.

Such price and payment shall be considered full compensation for all work covered by this section including all materials, construction, maintenance, and removal of *Gravel Construction Entrance*.

SAFETY FENCE:

Description

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. The fence shall be installed prior to any land disturbing activities.

Materials

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

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 ft. (1.52 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).

Construction Methods

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, minor grading along the fence line shall be performed to meet this requirement provided no obstructions to proper drainage are created.

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. Wood posts may be sharpened to a dull point if power driven. 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.

Measurement and Payment

Safety Fence will be measured and paid for as the actual number of linear feet (linear meters) installed in place and accepted. Such payment will be full compensation 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 this work.

Payment will be made under:

Pay Item	Pay Unit
Safety Fence	Linear Foot (Linear Meter)

COIR FIBER BAFFLE:

Description

Furnish material, install and maintain coir fiber baffles according to the details in the plans or in locations as directed. Coir Fiber Baffles shall be installed in silt basins at drainage outlets. Work includes providing all materials, placing, securing, excavating and backfilling of *Coir Fiber Baffles*.

Materials

(A) Coir Fiber Mat

Matting: Provide matting to meet the following requirements:

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

(B) Staples

Provide staples made of 0.125 in. (3.18 mm) diameter new steel wire formed into a *u* shape not less than 12" (305 mm) in length with a throat of 1" (25 mm) in width.

(C) Posts

Steel posts shall be at least 5 ft. (1.5 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 (1.86 kg/m) of length. The post shall be equipped with an anchor plate having a minimum area of 14.0 square inches (9000 square millimeters), and shall be of the self-fastener angle steel type to have a means of retaining wire and coir fiber mat in the desired position without displacement.

(D) Wire

Provide 8-gauge wire strand of variable lengths.

Construction Methods

Place the coir fiber baffles immediately upon excavation of basins. Install three (3) baffles in basins with a spacing of one fourth (1/4) the basin length and according to the detail sheets. Two (2) coir fiber baffles shall be installed in basins less than 20 ft. (6 m) in length with a spacing of one third (1/3) the basin length.

Steel posts shall be placed at a depth of 2 ft. (0.6 m) below the basin surface, with a maximum spacing of 4 ft. (1.2 m). Attach an 8-gauge wire strand to the steel posts at a height of 3 ft. (0.9 m) with plastic ties or wire fasteners. Install a steel post into side of the basin at a variable depth and a height of 3 ft. (0.9 m) from the bottom of the basin to anchor coir fiber mat. Secure anchor post to the upright steel post in basin with wire fasteners.

The coir fiber mat shall be draped over the wire strand to a minimum of 3 ft. (0.9 m) of material on each side of the strand. Secure the coir fiber mat to the wire strand with plastic ties or wire fasteners. Place staples across the matting at ends and junctions approximately 1 ft. (0.3 m) apart at the bottom and side slopes of basin. Overlap matting at least 6" (152 mm) where 2 or more widths of matting are installed side by side. Refer to details in the plan sheets. The Engineer may require adjustments in the stapling requirements to fit individual site conditions.

Measurement and Payment

Coir Fiber Baffles will be measured and paid for by the actual number of linear feet (linear meters) of coir fiber baffles which are installed and accepted. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the coir fiber baffles.

Payment will be made under:

Pay Item

Coir Fiber Baffle

Pay Unit

Linear Foot (Linear Meter)

SKIMMER BASIN WITH BAFFLES:**Description**

Provide a skimmer basin to remove sediment from construction site runoff at locations shown on the plans. See the Skimmer Basin with Baffle Detail sheet. Work includes constructing sediment basin, installation of coir fiber baffles, installation of Faircloth Skimmer or other approved equivalent device, providing and placing filter fabric emergency spillway liner, providing coir fiber mat stabilization for the skimmer outlet, disposing of excess materials, removing filter fabric liner and skimmer, backfilling basin area with suitable material and providing proper drainage when basin area is abandoned.

Materials

Item	Section
Filter Fabric for Drainage, Type 2	1056

Coir Fiber Baffles shall meet the specifications as provided elsewhere in this contract.

Provide appropriately sized Faircloth skimmer or other approved equivalent device.

Matting: Coir fiber matting for stabilization of the skimmer outlet shall meet the following requirements:

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

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"- 24" (305mm - 610mm) long with a 2" x 2" (51mm x 51mm) nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" (25mm - 51mm) long head at the top with a 1"- 2" (25mm - 51mm) notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" (610mm) nominal length. The bars shall have a 4" (102mm) diameter bend at one end with a 4" (102mm) straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" (3.18mm) diameter new steel wire formed into a *u* shape not less than 12" (305mm) in length with a throat of 1" (25mm) in width.

Construction Methods

Excavate basin according to the erosion control plans with basin surface free of obstructions, debris, and pockets of low-density material. Construct the emergency spillway according to Skimmer Basin with Baffles Detail sheet in the plans. Construct the coir fiber baffles according to the details in the plans and as provided elsewhere in this contract.

Install Faircloth skimmer or other approved equivalent device according to manufacturer recommendations.

Line emergency spillway with filter fabric unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of fabric in a trench at least 5" (127 mm) deep and tamp firmly. Make vertical overlaps a minimum of 18" (457 mm) with upstream fabric overlapping the downstream fabric. Secure fabric with eleven gauge wire staples shaped into a *u* shape with a length of not less than 6" (152 mm) and a throat not less than 1" (25 mm) in width. Place staples along outer edges and throughout the fabric a maximum of 3 ft. (0.9 meter) horizontally and vertically.

At the skimmer outlet, provide a smooth soil surface free from stones, clods, or debris that will prevent contact of the coir fiber matting with the soil. Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the details in the plans and as directed. Place anchors across the matting at the ends approximately 1 ft. (0.3 meter) apart. Place anchors along the outer edges and down the center of the matting 3 ft. (0.9 meter) apart.

Measurement and Payment

Silt Excavation will be measured and paid for in accordance with Articles 1630-4 and 1630-5 of the *Standard Specifications*, as calculated from the typical section throughout the length of the basin as shown on the final approved plans.

Filter Fabric for Drainage will be measured and paid for in accordance with Subarticles 876-5(C) and 876-6(C) of the *Standard Specifications*.

Coir Fiber Baffles will be measured and paid for as provided elsewhere in this contract.

__" *Skimmer* (__mm *Skimmer*) will be measured in units of each.

Coir Fiber Mat will be measured and paid for as the actual number of square yards (square meters) measured along the surface of the ground over which coir fiber mat is installed and accepted.

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

Payment will be made under:

Pay Item	Pay Unit
__" <i>Skimmer</i> (__mm <i>Skimmer</i>)	Each
<i>Coir Fiber Mat</i>	Square Yard (Square Meter)

TIERED SKIMMER BASIN WITH BAFFLES:

Description

Provide a tiered skimmer basin to remove sediment from construction site runoff at locations shown on the plans. See the Tiered Skimmer Basin Detail sheet. Tiered Skimmer Basins shall be installed in areas where topography creates a large elevation difference between the inlet and outlet of a single skimmer basin. Work includes constructing sediment basin, installation of coir fiber baffles, installation of temporary slope drains, installation of Faircloth Skimmer or other approved equivalent device, providing and placing filter fabric emergency spillway liners, providing coir fiber mat stabilization for the skimmer outlet, disposing of excess materials, removing filter fabric liner and skimmer, backfilling basin area with suitable material and providing proper drainage when basin area is abandoned.

Materials

Item	Section
Filter Fabric for Drainage, Type 2	1056
Temporary Slope Drain	1622

Coir Fiber Baffles shall meet the specifications as provided elsewhere in this contract.

Provide appropriately sized Faircloth skimmer or other approved equivalent device.

Matting: Coir fiber matting for stabilization of the skimmer outlet shall meet the following requirements:

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

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes 12"- 24" (305mm - 610mm) long with a 2" x 2" (51mm x 51mm) nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" (25mm - 51mm) long head at the top with a 1"- 2" (25mm - 51mm) notch following to catch and secure the coir fiber mat.

Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" (610mm) nominal length. The bars shall have a 4" (102mm) diameter bend at one end with a 4" (102mm) straight section at the tip to catch and secure the coir fiber mat.

Staples:

Provide staples made of 0.125" (3.18mm) diameter new steel wire formed into a *u* shape not less than 12" (305mm) in length with a throat of 1" (25mm) in width.

Construction Methods

Excavate basins according to the erosion control plans with basin surface free of obstructions, debris, and pockets of low-density material. Construct the emergency spillway according to Tiered Skimmer Basin Detail sheet in the plans. Construct the coir fiber baffles according to the details in the plans and as provided elsewhere in this contract.

Install a minimum of 2 (two) temporary slope drains to dewater the upper basin to the lower basin. The outlet of the slope drains shall be placed on the bottom elevation of the lower basin.

Install Faircloth skimmer or other approved equivalent device according to manufacturer recommendations.

Line emergency spillways with filter fabric unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of fabric in a trench at least 5" (127 mm) deep and tamp firmly. Make vertical overlaps a minimum of 18" (457 mm) with upstream fabric overlapping the downstream fabric. Secure fabric with eleven gauge wire staples shaped into a *u* shape with a length of not less than 6" (152 mm) and a throat not less than 1" (25 mm) in width. Place staples along outer edges and throughout the fabric a maximum of 3 ft. (0.9 meter) horizontally and vertically.

At the skimmer outlet, provide a smooth soil surface free from stones, clods, or debris that will prevent contact of the coir fiber matting with the soil. Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the details in the plans and as directed. Place anchors across the matting at the ends approximately 1 ft. (0.3 meter) apart. Place anchors along the outer edges and down the center of the matting 3 ft. (0.9 meter) apart.

Measurement and Payment

Silt Excavation will be measured and paid for in accordance with Articles 1630-4 and 1630-5 of the *Standard Specifications*, as calculated from the typical section throughout the length of the basin as shown on the final approved plans.

Filter Fabric for Drainage will be measured and paid for in accordance with Subarticles 876-5(C) and 876-6(C) of the *Standard Specifications*.

Coir Fiber Baffles will be measured and paid for as provided elsewhere in this contract.

__" *Skimmer* (__mm *Skimmer*) will be measured in units of each.

Coir Fiber Mat will be measured and paid for as the actual number of square yards (square meters) measured along the surface of the ground over which coir fiber mat is installed and accepted.

Temporary Slope Drains will be measured and paid for in accordance with Subarticles 1622-4 and 1622-5 of the *Standard Specifications*.

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

Payment will be made under:

Pay Item

__" Skimmer (__mm Skimmer)
Coir Fiber Mat

Pay Unit

Each
Square Yard (Square Meter)