
SECTION 32 92 00

TURF AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
1. Topsoiling.
 2. Fertilizing.
 3. Seeding.
 4. Sodding.
 5. Mulching.

1.2 REFERENCES

- A. Association of Official Seed Analysis (AOSA)
1. Rules for testing seed.
- B. American Association of State Highway and Transportation Officials (AASHTO)
1. AASHTO M140 Emulsified Asphalt.

1.3 SUBMITTALS

- A. Topsoil
1. Provide topsoil analysis performed in accordance with ASTM D5268 and demonstrating the topsoil meets Soil Conservation Service specified soil types.
 2. Submit results of tests for nutrient levels and provide recommendations for fertilizer type and application.
- B. Fertilizer
1. Furnish certification from supplier attesting to:
 - a. Brand name, chemical analysis, and guarantee of analysis.
- C. Seed
1. Furnish certification of conformance with AOSA "Rules for Testing Seed" and attest to:
 - a. Mix, age, weed content, purity, and germination.
- D. Sod
1. Furnish certification that sod complies with all State and Federal regulations with respect to inspection for plant diseases and insect infestation.
 2. Furnish certification of origin and date of cut.

- E. Mulch Material
 - 1. Furnish sample of mulch material when requested by Owner's representative.
- F. Erosion Mat
 - 1. Furnish sample of erosion mat material along with a certification of its physical properties.

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. Consists of adequate mineral content to support the growth of the intended vegetation, consists of Soils Class F-1 or F-2 (Soils and Aggregates) as required, shall meet the definition and specification stated in ASTM D5268, and meets one of the following SCS (Soil Conservation Service) soil textures:
 - 1. Loam.
 - 2. Sandy loam.
 - 3. Silt loam.
 - 4. Silty clay loam.
 - 5. Clay loam.
- B. The topsoil shall consist of adequate mineral content to support the growth of the intended vegetation and shall not contain herbicides which would be detrimental for the intended use.
- C. The topsoil shall have adequate fertility for quick establishment of vegetation.
- D. The pH of the topsoil shall be between 6.0 and 7.0.
- E. Topsoil shall be free from deleterious substances.
- F. Topsoil shall be free from roots, sticks, weeds, brush, stones or other litter and waste products.
- G. Pulverize and screen the topsoil such that 100 percent passes the 1-inch (25 mm) sieve and at least 90 percent passes the No. 10 (2.00 mm)..

2.2 FERTILIZER AND AGRICULTURAL LIMESTONE

- A. Fertilizer shall meet the recommendations of the soil analysis report required by Section "Soils and Aggregates".
- B. Agricultural Limestone
 - 1. Shall conform to Soil Class J-1 as defined in Section "Soils and Aggregates."

2.3 SEED

- A. Conform with the requirements of the governing authority for seeding and for restrictions on noxious weed seed.
- B. Seed mixture shall be composed of seeds of the purity, germination, and proportion by weight as follows:

Seed Mix #1 Ditches - Inslope Areas - Heavy Soil

Percent	Variety	Min. % Purity	Min. % Germination
35	85/80 KY Bluegrass	85	80
20	Creeping Red Fescue	97	85
20	Perennial Ryegrass	97	90
20	Tall Fescue (varieties below)	95	90
5	Redtop	92	85
100% Total			

Tall Fescue Varieties: Choose one or both:

- Fawn Tall Fescue
- KY31 Tall Fescue

Seeding rate of 3 to 4 lbs per 1M sq. ft.

Seed Mix #2 Ditches - Inslope Areas - Light Soil

Percent	Variety	Min. % Purity	Min. % Germination
10	85/80 KY Bluegrass	85	80
25	Creeping Red Fescue	97	85
25	Hard Fescue (varieties below)	97	85
20	Turf Type Tall Fescue (varieties below)	98	85
20	Perennial Ryegrass	97	90
100% Total			

Hard Fescue Varieties: Choose one or both:

- Scaldis Hard Fescue
- SR3100 Hard Fescue

Turf type tall fescue varieties: choose two of the five:

- Tulsa turf type tall fescue
- Regiment turf type tall fescue
- Crossfire turf type tall fescue
- Shortstop turf type tall fescue
- SR8200 turf type tall fescue

Seeding rate of 5 to 6 lbs per 1M sq. ft.

Seed Mix #3 Rural Areas - Cut & Fill Slopes >6/8'

Percent	Variety	Min. % Purity	Min. % Germination
20	85/80 KY Bluegrass	85	80
25	Creeping Red Fescue	97	85
25	Tall Fescue (varieties below)	95	90
20	Perennial Ryegrass	97	90
10	Empire Trefoil	95	80
100% Total			

Tall Fescue Varieties: Choose one or both:

Fawn Tall Fescue

KY31 Tall Fescue

Seeding rate of 5 to 6 lbs per 1M sq. ft.

Seed Mix #4 Urban Areas - Lawn Turf

Percent	Variety	Min. % Purity	Min. % Germination
30	Elite Bluegrass (varieties below)	98	85
20	98/85 KY Bluegrass	98	85
25	Creeping Red Fescue	97	85
25	Turf Type Perennial Ryegrass	96	85
100% Total			

Bluegrass Varieties: Include a maximum of 4 and a minimum of 2.

Adelphi Geronimo SR2100

Banff Gnome

Cynthia Merit

Cannan Parade

Seeding rate of 3 to 4 lbs per 1M sq. ft.

Seed Mix #5 Critical Area Stabilization

Percent	Variety	Min. % Purity	Min. % Germination
20	Improved Hard Fescue	97	85
20	Turf Type Tall Fescue (varieties below)	98	85
15	Little Bluestem	Pure live seed	
15	Side Oats Grama	Pure live seed	
5	Canada Wild Rye	Pure live seed	
25	Turf Type Perennial Ryegrass	95	85
100% Total			

Turf Type Tall Fescue Varieties: Choose two of the five:

Tulsa Regiment
Crossfire Shortstop
SR8200

Seeding rate of 2 to 3 lbs per 1M sq. ft.

Seed Mix #6 Critical Area - Poorly Drained Soils

Percent	Variety	Min. % Purity	Min. % Germination
20	85/80 KY Bluegrass	85	80
25	Tall Fescue (varieties below)	95	90
25	Perennial Ryegrass	96	85
10	Redtop	92	851
5	Climax Timothy	98	90
5	Alsike Clover	97	90
5	Mammoth Red Clover	98	90
5	Canada Wild Rye	Pure live seed	
100% Total			

Tall Fescue Varieties: Choose one or both:

Fawn Tall Fescue
KY31 Tall Fescue

Seeding rate of 2 to 3 lbs per 1M sq. ft.

Seed Mix #7 Low Maintenance - Light or Sandy Soils/Shade Areas

Percent	Variety	Min. % Purity	Min. % Germination
15	SR 3100 Hard Fescue	98	85
15	Scaldis Hard Fescue	98	85
10	Moxie Red Fescue	98	85
10	Dawson Red Fescue	98	85
20	SR 5100 Chewings Fescue	98	85
20	Azay Sheep Fescue	98	85
10	SR 4200 Dwarf Rye Grass	98	90
100% Total			

Seeding rate of 5 lbs per 1M sq. ft.

C. Temporary Nurse Crop

1. When required the Contractor shall furnish one of the following seed mixtures:

Species	Min. % Purity	Min. % Germ	Lbs. per Acre
Oats	98	90	80
Rye	98	85	100

2.4 SOD

- A. The sod shall consist of a dense, well rooted growth of permanent and desirable grasses, indigenous to the general locality where it is to be used.
- B. Sod shall meet the following general requirements:
 - 1. Free from weeds and undesirable grasses.
 - 2. Grass length of 2 inches.
 - 3. Cut in uniform strips 18 inches by 72 inches.
 - 4. Uniform thickness of 1½ inches or more.
 - 5. Adequately watered to prevent crumbling, breaking, or tearing during handling and placement.

2.5 MULCH

- A. Mulch shall consist of straw, hay, marsh hay, or wood chips which are free of noxious weeds and other objectionable foreign matter.
 - 1. If wood chips are used, the mulch area shall be treated with one (1) pound of available nitrogen per 1,000 square feet.
- B. Mulch binder shall conform to one of the following:
 - 1. Emulsified asphalt shall meet the requirements for Type SS-1 AASHTO M140.
 - 2. Terra Tack I, or equal.

2.6 EROSION MATS

- A. Jute fabric shall meet the following general requirements:
 - 1. Uniform, open weave of single jute yarn.
 - 2. Twisted construction having an average twist of not less than one and one-half turns per inch.
 - 3. Furnished in rolled strips 48 inches wide with a minimum of 78 wrapped ends.
 - 4. Fabric shall have a minimum of 41 weft yarns per linear yard of length.
 - 5. Weight of fabric shall be a minimum of 92 pounds per 100 square yards.
 - 6. Non-toxic to vegetation.
 - 7. Smolder resistant.
- B. Wood fiber blanket shall meet the following general requirements:
 - 1. Uniform web of interlocking wood excelsior fibers.
 - 2. Uniform thickness.
 - 3. Weight - 78 pounds per 80 square yards.
 - 4. Have net backing on one side as follows:
 - a. Mesh size not exceeding 1½ inches by 3 inches.
 - b. Woven of twisted paper, cotton cord, or biodegradable plastic.
 - 5. Non-toxic to vegetation.

- C. Permanent Geomats
 - 1. Consist of a tough, flexible matting made of a high density polyethylene or similar material.
 - 2. Ultra-violet resistant.
 - 3. Have a minimum thickness of 0.4 inch (1.0 cm).
 - 4. Non-toxic to vegetation.
 - 5. Contain no petroleum solvents or other agents toxic to plant or animal life.

- D. Staples
 - 1. Staples for anchoring erosion mat shall meet the following minimum requirements:
 - a. U-shaped.
 - b. No. 11 gage or larger diameter steel wire.
 - c. Width of 1 to 2 inches.
 - d. Length.
 - a) Not less than 6 inches for firm soil.
 - b) Not less than 12 inches for soft or loose soils.
 - c) Not less than 8 inches where erosion mat is placed over sod.

PART 3 - EXECUTION

3.1 TOPSOILING

- A. Topsoil all areas which are required to be seeded or sodded. Place topsoil to the following depth:
 - 1. Seeded Areas: 4 inches when settled.
 - 2. Sodded Areas: 3 inches when settled.

- B. Topsoil placement in rural areas:
 - 1. Place to required depth.
 - 2. Remove all cobble larger than 3 inches.
 - 3. Remove all debris.
 - 4. Mechanically break down all clods and lumps.
 - 5. Mechanically level and rake prior to applying seed.

- C. Topsoil placement for seeding lawns:
 - 1. Mechanically level subgrade to allow uniform placement of topsoil.
 - 2. Remove rocks, roots, clods, and other foreign material.
 - 3. Place topsoil to required depth.
 - 4. Mechanically level topsoil.
 - 5. Rake topsoil smooth and remove all lumps.
 - 6. Seed as required.

3.2 FERTILIZING AND LIMING

- A. Fertilize and lime all areas to be seeded or sodded.

- B. Application rate shall conform to soil analysis report.
- C. Incorporation shall be performed by mechanical means during seeding operation.

3.3 SEEDING

- A. Selection of seed mixtures, rate of seeding and intended use of the mixtures shall be as follows:

Seed Mixture	Rate of Seeding (Lbs. per 1,000 sq. ft.)	Intended Use
No. 1	3-4	Average loam or heavy clay soils.
No. 2	5-6	Light, sandy or gravelly soils. All ditches, inslopes.
No. 3	5-6	In rural areas on cut and fill slopes exceeding 6 to 8 feet.
No. 4	3-4	In urban area or other areas where a lawn type turf is desired.
No. 5	2-3	Critical area stabilization. May be used in conjunction with mixture No. 1 and No. 2 on steep slopes.
No. 6	2-3	Poorly drained soils. Critical area stabilization (usually not mowed).
No. 7	5	Low maintenance, light or sandy soils, shade areas.

- B. Seeding period shall be as recommended by the seed supplier.
- C. Seeding
1. Utilize a machine or combination of machinery which will produce the following:
 - a. Apply seed uniformly at the rate specified.
 - b. Cover seed with approximately ¼ inch of topsoil.
 - c. Roll lightly.
 - d. Apply seed at right angles to surface drainage.

3.4 MULCHING

- A. Complete mulching as follows:
1. Within 48 hours after seeding has been completed.
 2. Place all mulch uniformly to a loose depth of 1 to 1½ inches (2 to 3 tons per acre).
 3. Mulching operation shall begin at the top of slopes and proceed downward.
- B. Mulching shall be secured using one of the following methods:
1. Method "A"
 - a. Secure mulch with heavy twine or netting.
 - 1) Twine to be fastened with pegs or staples to form a grid of 6- to 10-foot spacing.
 2. Method "B"
 - a. Apply emulsified asphalt at the rate of 200 to 300 gallons per acre.

- b. Machinery used for placing mulch and emulsified asphalt shall produce a spotty tack sufficient to hold together and retain in-place the deposited mulch material.
3. Method "C"
 - a. Anchor mulch in soil by means of a mulch tiller.
 - b. Mulch shall be impressed in the topsoil to a depth of 1½ to 2½ inches in one pass of the tiller.

3.5 EROSION MAT

A. Erosion Mat – Installation

1. Install erosion mat at locations designated on the plans within 48 hours after completion of seeding.
2. Use only jute fabric over sodded areas.
3. All stones, soil clods, roots, sticks, and other foreign material shall be removed prior to placing the mat.

B. Installation of Jute Fabric Wood Fiber Blanket (Excelsior):

1. Matting strips to be laid in the direction of surface water flow.
2. Adjacent strips shall overlap at least 4 inches.
3. Mat strip ends shall overlap at least 10 inches.
4. Wood fiber blanket shall be installed with netting on top.
5. Bury the upgrade end of each strip of fabric at least 8 inches in a vertical slot cut in the soil and firmly tamping soil against fabric as follows:
 - a. For ditch grades of 4 percent or less, construct vertical slots every 50 feet.
 - b. For ditch grades of 4 percent or more, construct vertical slots every 25 feet.
6. Form terminal fold at the bottom end of the erosion mat by folding under approximately 4 inches of mat and stapling it to the ground.
7. Install staples as follows:
 - a. Vertically until tops are flush with the soil.
 - b. Space staples at 3-foot centers along overlap at mat edges and alternate at 3-foot centers through mat centers.
 - c. Space staples at 10-inch centers at mat ends and junction slots.

C. Installation of Permanent Geomats

1. Geomats shall be installed in accordance with the procedure recommended by the manufacturer and be suitable for the intended use.

3.6 APPLICATION

A. Apply landscaping and turf establishment procedures as follows:

1. Rural and unmowed areas with less than 4 to 1 slope:
 - a. Topsoil.
 - b. Seed.
 - c. Fertilize.
 - d. Mulch and mulch binder.
2. Rural and unmowed areas with 4 to 1 slopes to 3 to 1:
 - a. Topsoil.

- b. Seed.
- c. Fertilize.
- d. Stabilize with wood fiber erosion mat.
- 3. Rural and unmowed areas with 3 to 1 slopes or greater:
 - a. Topsoil.
 - b. Seed.
 - c. Fertilize.
 - d. Stabilize with permanent geomat.

3.7 MAINTENANCE

- A. Maintain all seeded and sodded areas until all the following conditions are met.
 - 1. Seeding: Establish a good stand of grass (uniform in density and color) satisfactory to Owner.
 - 2. Sodding: Establish a root system into sod bed.
 - 3. Capable of resisting erosion.
- B. Watering of turf shall be included in maintenance.

END OF SECTION