

SECTION 02936

SEEDING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Native Seeding.
- B. Channel Bank Native Seeding.
- C. Native Wildflower Seeding.
- D. Landscape Seeding.
- E. Roadside Seeding – Division I (Construction North of I-496) Only.
- F. Mulch Blanket, North American Green DS-150.

1.2 RELATED SECTIONS

- A. Section 02110 - Site Clearing.
- B. Section 02222 - Excavation.
- C. Section 02223 - Backfilling.
- D. Section 02218 - Landscape Grading.

1.3 MEASUREMENT AND PAYMENT

- A. Native Seeding:
 - 1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
 - 2. Basis of Payment: Includes labor, equipment, and material necessary to seed all disturbed areas not specified to receive other seeding or planting treatments. This includes finish grading, subsoil, daily seeding with approved seed mix, mulching, watering and maintenance to provide for uniform grass growth and any reseeding and erosion repair. Re-seeding and erosion repair is included to provide for uniform grass growth at the completion of the project and up to one year after completion.
- B. Channel Bank Native Seeding:
 - 1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
 - 2. Basis of Payment: Includes labor, equipment, and material necessary to seed all disturbed channel banks as specified on the plans and/or determined by the Engineer. This includes finish grading, subsoil, daily seeding with approved seed mix, mulching, watering and maintenance to provide for uniform grass growth and any reseeding and erosion repair. Re-seeding and erosion repair is included to provide for uniform grass growth at the completion of the project and up to one year after completion.

- C. Native Wildflower Seeding:
 - 1. Basis of Measurement: At the unit bid price bid per acre as stated in the proposal.
 - 2. Basis of Payment: Includes labor, equipment, and material necessary to seed areas indicated to receive Native Wildflower Seeding. This includes but is not limited to control structure embankments and upland areas around perimeter of wetland mitigation sites, etc. as specified on the plans and as determined by the Engineer. This includes finished grading, 6 inches of topsoil, importing of topsoil, subsoil, daily seeding, mulching, watering, and maintenance to provide for uniform grass growth and any re-seeding and erosion repair. Re-seeding and erosion repair is included to provide for uniform grass growth at the completion of the project and up to a one-year period after completion.

- D. Landscape Seeding:
 - 1. Basis of Measurement: At the unit price bid per acre or the lump sum price bid as stated in the proposal.
 - 2. Basis of Payment: Includes labor, equipment, and material necessary to seed yard, landscaped, garden areas etc. as specified on the plans and/or determined by the Engineer. This includes finished grading, 6 inches of topsoil unless otherwise specified, importing of topsoil, subsoil, daily seeding, fertilizing, mulching, watering, and maintenance to provide for uniform grass growth and any re-seeding and erosion repair. Re-seeding and erosion repair is included to provide for uniform grass growth at the completion of the project and up to a one-year period after completion.

- E. Roadside Seeding – Division I Only
 - 1. Basis of Measurement: At the lump sum price bid as stated in the proposal.
 - 2. Basis of Payment: Includes material, equipment and labor. This includes finish grading subsoil, 4 inches of topsoil unless otherwise specified, importing of topsoil, daily seeding, fertilizing, mulching, watering and maintenance to provide for uniform grass growth and any reseeding and erosion repair. Re-seeding and erosion repair is included to provide for uniform grass growth at the completion of the project and up to one year after completion.

- F. Mulch Blanket, North American Green DS-150:
 - 1. Basis of Measurement: At the unit price bid per square yard as stated in the proposal.
 - 2. Basis of Payment: Includes labor, equipment, and material to install mulch blanket with stakes per manufacturer's specification as shown in the specifications and/or plans or as directed by the Engineer.

1.4 PROTECTION

- A. Protect landscaping and other features remaining as final Work.
- B. Protect existing structures, fences, roads, sidewalks, paving, mailboxes, curbs, etc.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300 - Submittals.
- B. Submit shop drawings and product data for all items to be installed and/or constructed within this Section.
- C. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, location of packaging, any tags from seed bags and any receipt associated with seeding.

1.6 QUALITY ASSURANCE

- A. The Contractor shall make arrangements to obtain seed materials with nurseries a maximum 30 days after he/she is awarded contract and provide a list of suppliers to the Engineer.
- B. The Contractor will provide a final list of all species purchased to the Engineer a minimum of 90 days prior to seeding.

1.7 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.8 QUALIFICATIONS

- A. Seed Supplier: Company specializing in growing and cultivating applicable plant species.
- B. Installer: The seeding Contractor must be experienced and specialized in seeding the respective species as determined by the Engineer. He/she shall properly supervise a competent staff. The Contractor must have the necessary equipment to complete this task.
- C. Maintenance Services: Shall be provided by the Contractor for up to one year to guarantee establishment of growth.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600 – Material and Equipment.
- B. Deliver seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.10 COORDINATION

- A. Coordinate work under provisions of Section 01039 – Coordination and Meetings.

1.11 MAINTENANCE SERVICE

- A. Maintain seeded and sodded areas immediately after placement until grass is well established, exhibits a vigorous growing condition and is accepted by Owner. Guarantee reseeded of bare areas for one year following acceptance.

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. Topsoil:
 - 1. Reused - free of subsoil, roots, grass, excessive amount of weeds, stone, and foreign matter.
 - 2. Topsoil: Imported, friable loam; free of subsoil, roots, grass, excessive amount of weeds, stone, and foreign matter; acidity range (ph) of 5.5 to 7.5; containing a minimum of 4 percent and a maximum of 25 percent organic matter.

3. Topsoil furnished from outside the project limits shall be approved by the Engineer.

B. Seed Mixes:

1. Native Seeding:

Nativescape General Mix

Quantity (#)	Common Name	Scientific Name
Native Grasses 20%:		
4.0	Big Bluestem	<i>Andropogon gerardii</i>
1.0	Canada Wild Rye	<i>Elymus canadensis</i>
1.0	Switch Grass	<i>Panicum virgatum</i>
2.0	Little Bluestem	<i>Schizachyrium scoparium</i>
4.0	Indian Grass	<i>Sorghastrum nutans</i>

Temporary Grasses 80%:

20.0	Seed Oats	<i>Avena sativa</i>
10.0	Western Fescue	<i>Festuca occidentalis</i>
18.0	Annual Rye	<i>Lolium multiflorum</i>

2. Channel Bank Native Seeding:

Nativescape Native Floodplain Mix

Quantity (#)	Common Name	Scientific Name
Native Flowers - .05%:		
0.25	Swamp Milkweed	<i>Asclepias incarnata</i>
0.125	Flat-Top Aster	<i>Aster umbellatus</i>
0.125	New England Aster	<i>Aster novae-angliae</i>
0.25	Joepey Weed	<i>Eupatorium maculatum</i>
0.25	Boneset	<i>Eupatorium perfoliatum</i>
0.0625	Lance-leaved Goldenrod	<i>Euthamia graminifolia</i>
0.5	Dense Blazingstar	<i>Liatris spicata</i>
0.0625	Cardinal Flower	<i>Lobelia cardinalis</i>
0.0625	Great Blue Lobelia	<i>Lobelia siphilitica</i>
0.125	Green-headed Coneflower	<i>Rudbeckia laciniata</i>
0.125	Purple Meadowrue	<i>Thalictrum dasycarpum</i>
0.625	Blue Vervain	<i>Verbena hastata</i>
0.125	Wingstem	<i>Verbesina alternifolia</i>
0.25	Ironweed	<i>Vernonia fasciculata</i>
0.0625	Culver's Root	<i>Veronicastrum virginicum</i>

Native Grasses, Sedges and Bulrush – 25%:

3.0	Fox Sedge	<i>Carex vulpinoidea</i>
4.0	Canada Wild Rye	<i>Elymus canadensis</i>
6.0	Virginia Wild Rye	<i>Elymus virginicus</i>
0.25	Fowl Manna Grass	<i>Glyceria striata</i>
0.5	Dark Green Bulrush	<i>Scirpus atrovirens</i>
0.25	Wool Grass	<i>Scirpus cyperinus</i>
1.0	Prairie Cord Grass	<i>Spartina pectinata</i>

Temporary Grasses – 74.5%:

19.0	Seed Oats	<i>Avena sativa</i>
20.0	Annual Rye	<i>Lolium multiflorum</i>
3.0	American Slough Grass	<i>Beckmannia syzigachne*</i>

3. Native Wildflower Seeding:

Nativescape Showy Upland Mix

Quantity (#)	Common Name	Scientific Name
Native Flowers - 20% :		
0.125	Thimbleweed	<i>Anemone cylindrica</i>
0.125	Columbine	<i>Aquilegia canadensis</i>
0.125	Butterfly Weed	<i>Asclepias tuberosa</i>
0.125	Smooth Aster	<i>Aster laevis</i>
0.125	White False Indigo*	<i>Baptisia leucantha</i>
0.25	Tall Coreopsis	<i>Coreopsis tripteris</i>
0.125	Showy Tick Trefoil	<i>Desmodium canadense</i>
0.125	Ox Eye Sunflower	<i>Heliopsis helianthoides</i>
0.125	Roundhead Bushclover	<i>Lespedeza capitata</i>
0.75	Rough Blazing Star	<i>Liatris aspera</i>
0.75	Wild Lupine	<i>Lupinus perennis</i>
1.0	Bergamot, Bee Balm	<i>Monarda fistulosa</i>
4.0	Yellow Coneflower	<i>Ratibida pinnata</i>
3.5	Black-eyed Susan	<i>Rudbeckia hirta</i>
0.25	Prairie Dock	<i>Silphium terebinthinaceum</i>
0.5	Stiff Goldenrod	<i>Solidago rigida</i>
0.25	Showy Goldenrod	<i>Solidago speciosa</i>
0.25	Hoary Vervain	<i>Verbena stricta</i>

Native Grasses – 30% :

3.0	Slender Wheat Grass	<i>Agropyron trachycaulum</i>
4.0	Big Bluestem	<i>Andropogon gerardii</i>
2.0	Canada Wild Rye	<i>Elymus canadensis</i>
2.0	Bottlebrush Grass	<i>Hystrix patula</i>
2.0	Little Bluestem	<i>Schizachyrium scoparium</i>
5.0	Indian Grass	<i>Sorghastrum nutans</i>

Temporary Grasses – 50% :

15.0	Seed Oats	<i>Avena sativa</i>
15.0	Annual Rye	<i>Lolium multiflorum</i>

- a. Apply native seed mixes at a rate of 60 lb./acre.
- b. All Native Seed mixes shall be purchased from Nativescape, L.L.C. (Chris Lehr). Any alternate(s) must be approved by the Owner and Engineer.
- c. Shall be native to Michigan or Great Lakes region as approved by the Engineer.

4. Landscape Seeding:

Nativescape Turf Mix (apply a minimum rate of 220 lbs/acre)

Percent (%)	Common Name	Scientific Name
Fescue Grasses		
40.00	Creeping Red Fescue	<i>Festuca rubra</i>
20.00	Annual Ryegrass	<i>Lolium multiflorum</i>
15.00	Chewings Fescue	<i>Festuca rubra spp. commutata</i>
10.00	Kentucky Bluegrass	<i>Poa pratensis</i>
10.00	Perennial Ryegrass	<i>Lolium perenne</i>
5.00	Rough Bluegrass	<i>Poa trivialis</i>

5. Roadside Seeding: Seed mix shall be MDOT General Roadside Seed Mix as approved by the Engineer.
- C. Fertilizer:
 1. Apply 500 pounds per acre (12 pounds per 1000 square feet) of 12-12-12 commercial grade fertilizer or Engineer approved equivalent on landscape seeding, spoilbank seeding, and roadside seeding areas.
- D. Mulch:
 1. Apply 1200 pounds per acre (28 pounds per 1000 square feet) small grain straw mulch that is clean and weed free on all seeded areas unless otherwise indicated.
- E. Hydroseeding Mulching Material:
 1. Apply 1400 pounds/acre of Conwed Verdoyl #2000 with hydraulic seeder.
- F. Mulch Blankets:
 1. Install North American Green DS-150 or equivalent in areas with slopes 4 horizontal to 1 vertical and steeper as indicated on the plans or directed by the Engineer.
 2. Install all mulch blankets with 6 inch North American Green Eco Stakes or Engineer approved equivalent. Stake according to manufacturer's recommendations as approved by the Engineer.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that prepared soil base is ready to receive the Work of this Section and that the necessary excavation Work has been completed. See Section 02218 - Landscape Grading and Section 02222 - Excavation.
- B. Native Seeding, Channel Bank Native Seeding, Native Wildflower Seeding: Disc and cultipack (roll) site to ensure a flat and firm seedbed.

3.2 LANDSCAPE SEEDING, ROADSIDE SEEDING (HYDROSEEDING):

- A. All final landscape and roadside seeding shall be done using the hydroseeding method.
- B. Apply seed, fertilizer, and mulch slurry evenly on prepared seedbed with a hydraulic seeder.
- C. Apply water with a fine spray immediately after each area has been hydroseeded. Saturate to 3 inches of soil.
- D. Daily seed, fertilize, and mulch all disturbed areas with seed mix as approved by the Engineer.
- E. Additional seeding is required until uniform growth of grass is established.
- F. Apply seed at the rate specified in this Section Part 2.1 Materials.
- G. Seeding shall be done between May 15th and October 15th. Seeding done before or after these dates may require reseeding at the discretion of the Engineer.
- H. Apply fertilizer and mulch or mulch blankets at specified rates of application evenly on prepared seedbed and maintain clear of trees and shrubs.

- 3.3 NATIVE SEEDING, CHANNEL BANK NATIVE SEEDING, NATIVE WILDFLOWER SEEDING
- A. Daily seed and mulch all disturbed areas with native seed mix as approved by the Engineer.
 - B. Apply native seed mixes at a rate of 60 lb./acre.
 - C. Additional seeding is required until uniform growth of grass is established.
 - D. Seeding activities shall be conducted between May 1st and June 1st.
 - E. Seeding method:
 - 1. Hand broadcast native seed mix, and cover crop in designated areas. Mix seed with a lightweight inert material such as damp sawdust or vermiculite.
 - 2. For areas larger than 1 acre a mechanical planter, such as a Truax drill, may be used.
 - 3. Upon completion of seeding, rake or drag seed so that it is lightly covered with soil (approx. ¼ inch deep). The site should then be rolled to firm the seed into the soil. Approximately 25 percent of the seed should still be visible on the surface.
 - F. Apply mulch or mulch blankets at specified rates of application evenly on prepared seedbed and maintain clear of trees and shrubs. Allow sunlight to penetrate mulch so as not to cover more than 70% of the soil surface or as directed by the Engineer.
- 3.4 MAINTENANCE
- A. Immediately reseed areas, which show bare spots.
 - B. Repair any eroded areas and reseed immediately.
 - C. Final payment will not be issued until a uniform growth of grass is established for period of one year on all areas disturbed as a result of the construction of this Project. A minimum of eighty percent of the native species seeded shall be established prior to final payment.
 - D. The Contractor shall be responsible for watering during the one year guarantee period.
 - E. Monitor all seeded areas during site visits for water stress.
 - F. The Contractor shall replace, at no cost to the Owner, all dead vegetation during the Guarantee period.
 - G. Judgment of the plant's health will be the Engineers or the Owners.
 - H. Protection from traffic and erosion in newly seeded areas is the responsibility of the Contractor. Safety fences and/or silt fences with appropriate signage may be used at the Contractor's expense until the grasses and flowers are fully established.

END OF SECTION