SECTION 32 92 20

NATIVE SEEDING

**Based On DFD Master Specification Dated 01/06/2023**

This section has been written to cover typical situations that contractors will encounter. The Division of Facilities Development expects changes to this document to account for project specific conditions and design requirements. Use “Track Changes” when making modifications for Preliminary Design review. Text in red should be customized by the A/E.

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## PART 1 - GENERAL

**SCOPE**

The work under this section shall consist of providing all work, materials, labor, equipment and supervision necessary to complete native plant seeding, mulching, and maintenance operations. Included are the following topics:

**RELATED WORK**

Applicable provisions of Division 1 govern work under this Section.

Section 31 25 00 – Erosion Control

Section 32 91 19 – Soil Preparation

Section 32 92 00 – Plants

Section 00 00 00 – (Section Title)

**REFERENCE STANDARDS**

Association of Official Seed Analysis (AOSA)

**SUBMITTALS**

Provide copies of all quality assurance testing reports:

Soil-testing: For native topsoil, stockpiled/stored topsoil, and imported topsoil

Topsoil Description: Contractor to provide a written description and quantity of topsoil required; as native or imported, or a breakdown of each, prior to performing landscape work on the site.

Provide product data, including applicable analytical data, for required topsoil amendments including:

Organic Compost

Fertilizer

Proposed Seed Mix to be submitted prior to purchase

Seed Mix Label: Contractor to provide seed analysis tag from product packaging

Request for Inspection

Seeding Maintenance Log

**QUALITY ASSURANCE**

***If the A/E is including Section 32 91 13 – Soil Preparation, the following soil testing section should be deleted, and replaced with:***

Refer to Section 32 91 13 Soil Preparation for topsoil testing requirements and quality assurance procedures related to topsoil sampling, testing and amendment.

**SOIL TESTING**

The Contractor shall retain the services of an independent soil-testing laboratory to conduct testing and analysis of existing, salvaged, and imported topsoil. The selection of the soil-testing laboratory shall be subject to approval by the DFD Construction Representative and Architect/Engineer.

Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated, and that specializes in types of tests to be performed.

The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be approved by the Architect/Engineer. A minimum of three representative samples shall be taken, per-acre. Samples shall be taken from varied locations to test topsoil for all landscape planting types proposed in the Contract Documents.

The Contractor shall be responsible for scheduling soil tests and shall take into account the time period needed by the soil testing laboratory to conduct tests, to process the samples, and to publish the results and recommendations, and the time needed by the Architect/Engineer to approve submittals and amendments recommended. This is typically at least a two-month process. Contractor is responsible for coordinating all testing and reporting tasks without adversely affecting the project schedule.

Contractor is responsible for paying for all costs related to testing of soil samples.

Soil Analysis: For each un-amended topsoil sample, submit for approval by the DFD Construction Representative and Architect/Engineer a soil analysis and a written report by a qualified soil-testing laboratory, stating existing percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; harmful material; pH; and mineral and plant-nutrient content of the soil.

Topsoil testing methods shall comply with ASTM D5268, Standard Specification for Topsoil Used for Landscaping Purposes.

Report suitability of tested soil to support turf and plant growth.

Based on the test results, provide written recommendations for soil treatments and amendments to be incorporated to support turf and plant growth. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients; and soil amendments to be added to topsoil.

Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide recommendations for corrective action.

The DFD Construction Representative and Architect/Engineer reserve the right to reject improperly amended native topsoil or imported topsoil that does not meet the quality assurance specifications. If rejected, Contractor is responsible for costs of replacement, and/or amendment, and re-testing of topsoil to provide topsoil that will support turf and plant growth.

# DELIVERY, STORAGE AND HANDLING

Seed shall be delivered to the site in its original, unopened container, labeled as to weight, analysis, and manufacturer. Store any seed delivered prior to use in a manner safe from damage from heat, moisture, rodents, or other causes. Any seed damaged after acceptance shall be replaced by the Contractor.

**EQUIPMENT WEED CONTROL**

All equipment brought into project site shall be clean and free of weed seed or seed from previous operations. The intent is reducing the spread of noxious and invasive plants and weeds within the State of Wisconsin.

On a daily basis, prior to entering the project site, all equipment shall be sprayed clean of all dirt, sod, or foreign matter with high-pressure water at an upland location outside of the project site and that does not drain to the site. Equipment required to be cleaned shall include, but is not limited to, all dozers, scrapers, backhoes, trucks, shovels, picks, and hand tools that enter the project site. Special care shall be taken to cleanse the underbody, suspension, tracks, wheels, tires, and wheel wells of all motorized equipment. If necessary, hand tools, brushes, or scrapers may be required to remove heavy accumulations of debris from any item. After a thorough cleaning and inspection, each item of equipment shall be allowed to enter and be used on the project site. If it is necessary for the equipment to leave and reenter the project site, each item shall be cleaned and inspected before reentry.

**INSTALLATION SCHEDULE**

Seed during one of the following periods:

Spring Installation: May 1 to Mid-July

Fall Installation: September 1 to Mid-October

Dormant Seeding: only permitted upon written approval by DFD Construction Representative and Architect/Engineer

Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit. No seeding shall occur on frozen ground or at air temperatures lower than 32o F. Do not broadcast or drop seed when wind velocity exceeds 5 mph.

**JOB CONDITIONS**

During construction, protect all structures, utilities, sidewalks, pavements, and other facilities and existing and newly installed vegetated areas from damage at all times. All vegetation damaged during construction shall be treated, repaired or replaced with new material as necessary, to restore to the original condition.

Work areas shall be kept clean and orderly during the installation period. Under no condition shall debris from planting activities result in a safety hazard on-site or to adjacent off-site property.

***Verify warranty requirements below based on project specific conditions.***

# WARRANTY

Contractor shall warranty the establishment of a satisfactory native seeded area within one year after Native Seeding Acceptance. This assumes the Owner performs required maintenance (i.e., regular watering) after the Contractor’s maintenance period is completed. Contractor shall inform Owner when required maintenance has concluded.

Satisfactory native seeded area: At end of the warranty period, a healthy, uniform stand of native plants has been established as follows:

The seeded species shall provide at least 65% coverage with no single area devoid of the seeded species greater than 9 square feet.

The weed coverage shall be less than 25%.

If the Contractor does not meet the Warranty requirements, the DFD Construction Representative, the Architect/Engineer, and Contractor shall determine an approach for increasing the density of the seeded species and/or decreasing the density of weeds at the Contractor’s expense. Methods to achieve a satisfactory stand of plants may include but are not limited to:

Applying herbicides to the native seeded area or portions of the native seeded area.

Re-seeding the native seeded area or portions of the native seeded area.

Selective use of live plants.

The Contractor shall provide an additional period of native seeded area maintenance following any actions needed to re-seed, re-plant, or establish satisfactory weed control per the warranty requirements at the Contractor’s expense.

Damage to vegetated and lawn areas incurred as a result of warranty replacement operations shall be repaired by Contractor at no cost to Owner.

During the Warranty Period, damage to native seeded areas not caused by Contractor shall be excluded from Warranty. Such damage shall include ruts caused by driving vehicles over native seeded areas, excavation and backfill work in native seeded areas, or acts of vandalism or extreme weather conditions. Where evidence of such damage exists, advise Owner in writing, stating location, cause and extent of damage. Owner, upon receipt of such notice may order Contractor to correct damage at Owner’s expense to exclude damaged area from Warranty provisions and correct damage by any arrangement deemed by Owner in his/her best interest.

**PART 2 - PRODUCTS**

# Native Seed

Native seed shall conform to the Wisconsin Statutes and Wisconsin Administrative Code Chapter ATCP 20 regarding noxious weed seed content and product labeling.

Fresh, clean, dry, new seed free of noxious weeds that meets or exceeds the minimum requirements of purity and germination stated on an independent certificate of seed analysis document according to the Association of Official Seed Analysts (AOSA) rules.

Do not use wet seed or seed that is moldy or otherwise damaged. All seed packaging shall include a seed tag that contains: the name of the seller, the lot number, seed varieties with purity and germination percentages, as well as percentage of other crop seed, weed seed, noxious weeds and inert material.

Species composed of pure live seed (PLS) shall contain no named or improved varieties. PLS shall be from Wisconsin, Northern Illinois, Northeastern Iowa or Eastern Minnesota nurseries specializing in growing native species from Wisconsin genotypes.

Grasses classified as “agriculture grasses” shall be PLS as specified. Other seed shall be “clean” according to high quality industry standards. All seed shall be cold, dry stratified; legumes shall be inoculated with proper rhizobia immediately prior to planting (three hours or less). Legumes shall be kept out of the forb mixture until after inoculation. Seed mixture shall be blended by the vendor and ratios of various species shall be guaranteed by the vendor in writing as specified. Minimum percent purity for native species is 90 percent. Any substitutions of species due to availability must be approved by DFDM Construction Representative and Architect/Engineer.

Use seed within one year of the test date appearing on the label.

Inoculate legume seed unless it has been pre-inoculated by the vendor. Follow the inoculation instructions that come with the culture purchases. Avoid exposure of the culture or inoculated seed to the sunlight, and in no case shall any exposure exceed ½ hour.

Store any seed delivered before use in a manner that protects it from damage by heat, moisture, rodents, or other causes. Discard and replace any previously tested and accepted seed that becomes damaged.

Seed carrier (only when hand broadcasting) shall be inert material, sawdust, perlite, peat moss or vermiculite mixed with seed at a ratio of not less than two parts seed carrier to one part seed.

***Verify seed mix based on project specific conditions. Delete seed mixes that do not apply. DNR projects may require specific seed mixes to be ecologically compatible to the Ecotype of the Natural Area and limit the PLS source locations.***

**Native Seed Mixes:**

Seed Mixture A - Dry Prairie: full to part sun, dry sand to gravely soil; per landscape schedule

Seed Mixture B - Dry-Mesic Prairie: full to part sun, well drained loam, sandy loam and silt loam soil; per landscape schedule

Seed Mixture C - Mesic Prairie: full to part sun, clay to heavy clay soil; per landscape schedule

Seed Mixture D - Woodland Edge: shade to part shade, rich loam, sandy loam and clay loam soils: per landscape schedule

Seed Mixture E - Moist Prairie: full to part sun, moist loam, sandy loam and clay loam soil; per landscape schedule

Seed Mixture F - Northern Wisconsin Woodland Edge: shade to part shade, rich loam, sandy loam and clay loam soils; per landscape schedule

**Seed Mixture A** **- Dry Prairie:**  Mixture shall be from a minimum of 20 of the following forbs and legumes, with no more than ten percent by weight of any one species and five of the grasses listed. Use a seeding rate of ¼ lb. per 1000 square feet (approximately 8-10 lbs. per acre).

*Forbs and Legumes:*

Common Name Botanical Name

 Leadplant Amorpha canescens

 Beach Silvermound Artemesia caudata

 Butterflyweed Asclepias tuberosa

 Sky Blue Aster Aster azureus

 Smooth Aster Aster laevis

 Frost Aster Aster pilosus

 White Aster Aster ptarmicoides

 Canada Milk Vetch Astragalus canadensis

 Lanceleaf or Sand Coreopsis Coreopsis lanceolata

 Purple Prairie Clover Dalea purpurea

 Pale Purple Coneflower Echinacea pallida

 Flowering Spurge Euphorbia corollata

 Showy Sunflower Helianthus laetiflorus

 Downy Sunflower Helianthus mollis

 False Boneset Kuhnia eupatoriodes

 Roundheaded Bushclover Lepedeza capitata

 Rough Blazing Star Liatris aspera

 Lupine Lupinus perennis

 Bergamot Monarda fistulosa

 Dotted Mint Monarda punctata

 Beardtongue Penstemon grandiflorus

 Prairie Cinquefoil Potentilla arguta

 Yellow Coneflower Ratibida pinnata

 Rosinweed Silphium integrifolium

 Black Eyed Susan Rudbeckia hirta

 Showy Goldenrod Solidago speciosa

 Ohio Spiderwort Tradescantia ohioensis

 Hoary Vervain Verbena stricta

*Grasses:*

 Big Bluestem Andropogon gerardi

 Sideoats Grama Bouteloua curtipendula

 Canada Wild Rye Elymus Canadensis

 June Grass Koeleria cristata

 Little Bluestem Schizachyrium scoparium

 Indiangrass Sorghastrum nutans

 Prairie Dropseed Sporobolus heterolepis

**Seed Mixture B** - **Dry-Mesic Prairie:** Mixture shall be from a minimum of 20 of the following forbs and legumes, with no more than ten percent by weight of any one species and five of the grasses listed. Use a seeding rate of ¼ lb per 1000 square feet (approximately 8-10 lbs. per acre).

*Forbs and legumes:*

Common Name Botanical Name

 Lavender Hyssop Agastache foeniculum

 Nodding Pink Onion Allium cernuum

 Meadow Anemone Anemone canadensis

 Sky Blue Aster Aster azureus

 Smooth Aster Aster laevis

 Arrow-leaved Aster Aster sagittifolius

 New Jersey Tea Ceanothus americanus

 Canada Milk Vetch Astragalus canadensis

 Lanceleaf Coreopsis Coreopsis lanceolata

 Prairie Coreopsis Coreopsis palmata

 White Prairie Clover Dalea candida

 Purple Prairie Clover Dalea purpurea

 Shootingstar Dodecatheon meadia

 Pale Purple Coneflower Echinacea pallida

 Purple Coneflower Echinacea purpurea

 Rattlesnake Master Eryngium yuccifolium

 Western Sunflower Helianthus occidentalis

 Roundhead Bushclover Lepedeza capitata

 Rough Blazing Star Liatris aspera

Meadow Blazing Star Liatris ligulistylis

Prairie Blazing Star Liatris pycnostachya

Wild Quinine Parthenium integrifolium

Smooth Penstemon Penstemon digitalis

Great Solomon’s Seal Polygonatum canaliculatum

Mountain Mint Pycnanthemum virginianum

Black Eyed Susan Rudbeckia hirta

Stiff Goldenrod Solidago rigida

Ohio Spiderwort Tradescantia ohiensis

Hoary Vervain Verbena stricta

*Grasses:*

 Sideoats Grama Bouteloua curtipendula

 Canada Wild Rye Elymus Canadensis

 Virginia Wild Rye Elymus virginicus

 Little Bluestem Schizachyrium scoparium

 Prairie Dropseed Sporobolus heterolepis

 Needle Grass Stipa spartea

**Seed Mixture C** - **Mesic Prairie:** Mixture shall be from a minimum of 20 of the following forbs and legumes, with no more than ten percent by weight of any one species and five of the grasses listed. Use a seeding rate of ¼ lb per 1000 square feet (approximately 8-10 lbs. per acre).

*Forbs and legumes:*

Common Name Botanical Name

Nodding Pink Onion Allium cernuum

 Smooth Aster Aster laevis

 New England Aster Aster Novae-angliae

 Canada Milk Vetch Astragalus canadensis

 Blue False Indigo Baptisia australis

 White False Indigo Baptisia lactea

 Wild Senna Cassia hebecarpa

 Lanceleaf Coreopsis Coreopsis lanceolata

 Purple Prairie Clover Dalea purpurea

 Pale Purple Coneflower Echinacea pallida

 Purple Coneflower Echinacea purpurea

 Rattlesnake Master Eyrngium yuccifolium

 Ox Eye Sunflower Heliopsis helianthoides

 Prairie Blazing Star Liatris pycnostachya

 Bergamot Monarda fistulosa

 Wild Quinine Parthenium integrifolium

 Smooth Penstemon Penstemon digitalis

 Yellow Coneflower Ratibida pinnata

 Black Eyed Susan Rudbeckia hirta

 Sweet Black Eyed Susan Rudbeckia subtomentosa

 Brown Eyed Susan Rudbeckia triloba

 Compassplant Silphium laciniatum

 Prairie Dock Silphium terebinthinaceum

 Stiff Goldenrod Solidago rigida

 Culver’s Root Veronicastrum virginicum

*Grasses:*

 Big Bluestem Andropogon gerardi

 Canada Blue Joint Grass Calamagrostis canadensis

 Canada Wild Rye Elymus Canadensis

 Switch Grass Panicum virgatum

 Little Bluestem Schizachyrium scoparium

 Indiangrass Sorghastrum nutans

**Seed Mixture D** - **Woodland Edge:** Mixture shall be from a minimum of 20 of the following forbs and legumes, with no more than ten percent by weight of any one species and each of the grasses listed. Use a seeding rate of ¼ lb per 1000 square feet. (approximately 8-10 lbs. per acre).

*Forbs and legumes:*

Common Name Botanical Name

Purple Hyssop Agastache scrophulariaefolia

Wild Columbine Aquilegia canadensis

Jack in the Pulpit Arisaema triphyllum

Calico Aster Aster lateriflorus

Blue False Indigo Baptisia australis

White False Indigo Baptisia lactea

Pale Indian Plantain Cacalia atriplicifolia

Tall Bellflower Campanula americana

Shootingstar Dodecatheon meadia

Purple Coneflower Echinacea purpurea

Sweet Joe Pye Weed Eupatorium purpureum

Wild Geranium Geranium maculatum

Woodland Sunflower Helianthus strumosus

Prairie Alum Root Heuchera richardsonii

Rough Blazing Star Liatris aspera

Bergamot Monarda fistulosa

Glade Mallow Napaea dioica

Smooth Penstemon Penstemon digitalis

Great Solomon’s Seal Polygonatum canaliculatum

Black Eyed Susan Rudbeckia hirta

Sweet Black Eyed Susan Rudbeckia subtomentosa

Brown Eyed Susan Rudbeckia triloba

Solomon’s Plume Smilacina racemosa

Elm-leaved Goldenrod Solidago ulmifolia

Culver’s Root Veronicastrum virginicum

Golden Alexanders Zizia aurea

*Grasses and sedges:*

 Woodland Brome Bromus purgans

Woodland Sedge Carex sprengelii

 Silky Wild Rye Elymus villosus

 Virginia Wild Rye Elymus virginicus

 Bottlebrush Grass Hystrix patula

 Rice Cut Grass Leersia oryzoides

**Seed Mixture E - Moist Prairie:** Mixture shall be from a minimum of 20 of the following forbs and legumes, with no more than ten percent by weight of any one species and each of the grasses, rushes and sedges listed. Use a seeding rate of ¼ lb per 1000 square feet (approximately 8-10 lbs. per acre).

*Forbs and legumes:*

Common Name Botanical Name

Nodding Pink Onion Allium cernuum

Red Milkweed Asclepias incarnata

New England Aster Aster novae-angliae

White False Indigo Baptisia lactea

Wild Senna Cassia hebecarpa

Joe Pye Weed Eupatorium maculatum

Boneset Eupatorium perfoliatum

Dogtooth Daisy Helenium autumnale

Ox Eye Sunflower Heliopsis helianthoides

Wild Iris Iris shrevei

Blue Flag Iris Iris versicolor

Prairie Blazing Star Liatris pycnostachya

Dense Blazing Star Liatris spicata

Great Blue Lobelia Lobelia siphilitica

Cardinal Flower Lobelia cardinalis

Monkeyflower Mimulus ringens

Bergamot Monarda fistulosa

Wild Quinine Parthenium integrifolium

Smooth Penstemon Penstemon digitalis

Yellow Coneflower Ratibida pinnata

Black Eyed Susan Rudbeckia hirta

Green Headed Coneflower Rudbeckia laciniata

Sweet Black Eyed Susan Rudbeckia subtomentosa

Brown Eyed Susan Rudbeckia triloba

Common Arrowhead Sagittaria latifolia

Ohio Goldenrod Solidago ohioensis

Stiff Goldenrod Solidago rigida

Blue Vervain Verbena hastata

Ironweed Vernonia fasciculata

Culver’s Root Veronicastrum virginicum

Golden Alexanders Zizea aurea

*Grasses, Rushes and Sedges:*

 Bluejoint Grass Calamagrostis canadensis

 Canada Wild Rye Elymus canadensis

 Virginia Wild Rye Elymus virginicus

 Bebb’s Sedge Carex bebbii

 Bottlebrush Sedge Carex comosa

 Porcupine Sedge Carex hystericina

 Awl Fruited Sedge Carex stipata

 Fox Sedge Carex vulpinoidea

 Common Rush Juncus effusus

 Dark Green Bulrush Scirpus atrovirens

 Woolgrass Scirpus cyperinus

**Seed Mixture F - Northern Wisconsin Woodland Edge:** Mixture shall be from a minimum of 20 of the following forbs, grasses, sedges, and legumes, with no more than ten percent by weight of any one species and each of the grasses listed. Use a seeding rate of ¼ lb per 1000 square feet (approximately 8-10 lbs. per acre).

*Forbs and legumes:*

Common Name Botanical Name

Purple Hyssop Agastache scrophulariaefolia

Wild Columbine Aquilegia canadensis

Jack in the Pulpit Arisaema triphyllum

Wild Ginger Asarum canadense

Heart-leaved Aster Aster cordifolius

Calico Aster Aster lateriflorus

Big–leaved Aster Aster macrophyllus

Pale Indian Plantain Cacalia atriplicifolia

Tall Bellflower Campanula americana

Northern Bedstraw Galium boreale

Wild Geranium Geranium maculatum

Rough Blazing Star Liatris aspera

Bishop’s Cap Mitella diphylla

Bergamot Monarda fistulosa

Glade Mallow Napaea dioica

Sweet Cicely Osmorhiza claytonii

Smooth Penstemon Penstemon digitalis

Jacob’s Ladder Polemonium reptans

Great Solomon’s Seal Polygonatum canaliculatum

Black Eyed Susan Rudbeckia hirta

Sweet Black Eyed Susan Rudbeckia subtomentosa

Brown Eyed Susan Rudbeckia triloba

Solomon’s Plume Smilacina racemosa

Elm-leaved Goldenrod Solidago ulmifolia

Golden Alexanders Zizia aurea

*Grasses and sedges:*

 Woodland Brome Bromus purgans

Woodland Sedge Carex sprengelii

 Silky Wild Rye Elymus villosus

 Virginia Wild Rye Elymus virginicus

 Bottlebrush Grass Hystrix patula

 Rice Cut Grass Leersia oryzoides

# Nurse Crop

Nurse crops such as Annual Rye or Oats shall be planted with the native seed to stabilize the soil and reduce weed growth. Use Oats (64 lbs./acre) or Annual Rye (5 lbs./acre) for spring planting. Use Annual Rye (15 lbs./acre) for fall dormant planting.

# Water

Water free of wastewater effluent or other hazardous chemicals.

**topsoil**

Naturally fertile, agricultural soil, classified as sandy loam to silty loam, capable of supporting turf and plant growth; of uniform composition throughout, without admixtures of subsoil, free of clay lumps, stones larger than 1” diameter [¾” diameter for athletic field uses], roots, trash and debris of any kind.

Soil-testing results shall indicate that topsoil falls within the following acceptable ranges, or can be amended to conform to the following requirements:

pH between 5.5 -7.0

USDA classification loam, sandy loam, clay loam

Phosphorous (P) between 6-10 ppm

Potassium (K) between 51-100 ppm

Organic Matter between 5-8%

C:N Ratio between 12:1 to 15:1

Soluble Salts in the range of 0-2 dS/m

Moisture Capacity of greater than 15%

Heavy Metals acceptable ranges are as follows:

Cd 0.01-3.0 ppm

Co 1.0-40.0 ppm

Cr 5.0-1000.0 ppm

Cu 2.0-100.0 ppm

Fe 10000-50000 ppm

Mn 100-4000 ppm

Mo 0.5-40.0 ppm

Ni 1.0-200.0 ppm

Pb 2.0-200.0 ppm

Zn 10-300 ppm

Li 1.2 – 90.0 ppm

**SAND**

Particles of natural or manufactured rock that will pass through a No. 4 sieve., and be retained on a No. 200 sieve; clean, washed, and free of toxic materials.

**Lime**

Agricultural limestone material containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing through No. 8 sieve, and a minimum 75 percent passing through No. 60 sieve.

**PEAT MOSS**

Sphagnum peat moss, free of weeds and seeds, with a pH range of 5.5 to 8.0.

**Mulch**

Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

**EROSION CONTROL BLANKET**

100% biodegradable weed free wood excelsior, straw, or coconut-fiber mat enclosed in a biodegradable netting stitched with biodegradable thread/yarn, (biodegradable within 12 months of installation) or net free. Include manufacturer's recommended steel wire staples, 6" long or biodegradable anchoring staples, T shaped with barbed head and shoulders, 6 inches. Wisconsin DOT approved Class 1 Type B Urban erosion mat or similar are acceptable. Biodegradable materials are intended to avoid entrapment of animals. Erosion mat shall be American Excelsior-Curlex Net-Free, Erosion Control Blanket-S32BD, Western Excelsior-Excel SS-2 All Natural, Ero-Guard EG-25 (NN), Erosion Tech ETRS2BN or approved equal.

**EROSION CONTROL FIBER MESH**

100% biodegradable twisted jute mesh. Include manufacturer's recommended steel wire staples, 6 inches long or biodegradable anchoring staples, T shaped with barbed head and shoulders, 6 inches.

***Herbicide use will need to be determined by site and proximity to water areas.***

**NONSELECTIVE HERBICIDES**

EPA registered and approved glyphosate-based herbicide (broad spectrum, non-persistent) intended for vegetation removal while preparing seed beds and for maintenance during establishment period and recommended surfactants and adjuvants.

**PART 3 - EXECUTION**

# SITE PREPARATION

During construction, protect all structures, utilities, sidewalks, pavements, and other facilities and existing and newly installed vegetated areas from damage at all times.

Delay grading and spreading topsoil if unfavorable weather conditions may result in washouts or loss of material.

***A/E delete the following section if using Section 32 91 12: Soil Preparation***

**SOIL PREPARATION**

Newly graded subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

Rough grade areas to within 1 inch of subgrade elevations. Areas shall be graded to a smooth uniform surface plane with loose, uniformly fine texture. Areas shall be restored if eroded or otherwise disturbed after rough grading is complete.

Areas to be seeded shall have a minimum of [4 to x] inches of topsoil of existing, amended or imported topsoil, but not less than required to meet finish grades after light rolling and natural settlement. Do not spread topsoil if subgrade is frozen, muddy, or excessively wet.

If required topsoil depth is greater than 6 inches, topsoil shall be installed in lifts. Moisten the topsoil surface between lifts. Allow water to thoroughly percolate through and settle and dry before rolling and placing the next lift.

Do not place topsoil on top of saturated or frozen subgrade soil.

Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be seeded in the immediate future.

If grading operations are not completed within the established planting season, the site shall be seeded with an approved nurse crop to protect the soil in place until the next appropriate and approved planting season. The nurse crop may be hydroseeded in lieu of erosion control mat. The nurse crop would require mowing before permanent seed sowing.

Existing vegetated areas: If seeding occurs in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:

Mow vegetation to 4 inches or less in height 4-6 weeks before seeding. Ten days after mowing, spray vegetation with a broad spectrum, non-persistent glyphosate-based herbicide per manufacturer’s instructions. Retreat vegetation with broad spectrum, non-persistent glyphosate-based herbicide after initial application if live vegetation persists. Remove mowed vegetation. Do not mix vegetation into surface soil. Seeding should occur after time period specified by herbicide manufacturer.

***Verify seed sowing rate based on project specific conditions****.*

# SEEDING

No seeding shall occur on frozen ground or at air temperatures lower than 32o F.

Sow seed at a rate of ¼ lbs. per 1000 square feet (approximately 8-10 lbs. per acre).

Sow the selected seed mixture with a No-Till type drill with one or more seed boxes that can be calibrated independently to deliver different sized seeds uniformly at the required rate equipped with area-mounted press wheel for each seed drop tube or by scattering it uniformly over the areas to be seeded. If seeding into existing vegetation use a rangeland type drill with a no-till attachment that can cut through the thatch in front of the V disc and seed drop tube. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

Hand broadcast seeding may be used for small areas with difficult access on prepared seedbeds. Follow by light raking or dragging to cover the seed with approximately ¼ inch of soil. If the seedbed is too loose or if the seedbed contains clods that might reduce seed germination lightly roll or compact the areas using suitable equipment, preferably the cultipacker type. Do not roll slopes steeper than 3:1.

Alternative methods of seeding or hydro-seeding may be utilized by Contractor with approved by Owner in writing.

# MULCHING and erosion control

Protect seeded areas by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

On steep slopes and windy sites hold the straw in place by staking down biodegradable jute mesh netting over the surface of mulch or apply a light biodegradable erosion control blanket instead of straw mulch.

In bioinfiltration areas a biodegradable erosion mat is required to prevent movement of mulch and clogging drainage systems.

Biodegradable erosion control mats shall be installed on slopes of 30% or greater and other locations as shown on the drawings.

Alternative methods of mulching or hydromulching may be utilized by Contractor with approved by Owner in writing.

**SEEDING ACCEPTANCE**

The DFDM Construction Representative and the Architect/Engineershall perform inspections with the Contractor at the conclusion of the required maintenance period to verify that the native seeded areas have been satisfactorily established.

Request for Inspection: Contractor shall submit a request for inspection to the DFDM Construction Representative and Architect/Engineer. The request shall be received at least 10 (ten) days before the anticipated date of inspection.

Any defects or imperfections appearing in whole, or any part of the work caused by or due to any fault or negligence on the part of the Contractor shall be corrected before the work is accepted.

Seeding work may be accepted in stages when the Contractor and Owner deem that practice to be in their mutual interest. Approval must be given in writing by Owner to the Contractor verifying that work may be completed in stages.

Acceptance of seeding work shall not waive any other provisions of the Warranty

# CLEANING AND REPAIR

Waste and excess material from the seeding operation shall be promptly removed. Adjacent paved areas are to be cleaned, and any damage to existing adjacent landscape areas shall be repaired.

***Verify maintenance watering and mowing requirements based on project specific conditions****.*

# MAINTENANCE

Contractor to provide regular watering, weeding, pest management, and trash removal services for all newly seeded areas for a period of 60 (sixty) days after the date of seeding acceptance, at which time maintenance duties will be taken over by the Owner.

Contractor shall provide a temporary irrigation system or import water via watering truck as often as necessary to maintain adequate surface soil moisture for proper seed germination. Watering shall continue for not less than 30 days following seeding. After the first eight weeks, water only if it does not rain for one week.

Contractor shall perform weeding by mechanical means. Individual weed plants shall be removed by the roots, using a hand-weeder. Use of herbicide for weed control shall be requested by Contractor and allowed only with approval by Owner in writing for trouble areas.

Chemical applications of fertilizer or herbicides are to be performed in accordance with current federal, state and local laws, through EPA-registered materials and application techniques, and performed under the supervision of a licensed certified applicator.

Selectively treat aggressive weeds such as Canada Thistle and Horsenettle with a broad spectrum, non-persistent glyphosate-based herbicide. Treat only on cool windless days preferably by gloved hand wiping method.

Mowing: Maintain by mowing the planting when the nurse cover or weed vegetation reaches a height of 10-12 inches. Mow to a height of 6 inches except for first mowing which shall be to a 4-inch height. Mowing can be expected approximately every 3-4 weeks during the first growing season depending on the weed species present. Raking and removal of clippings shall occur when greater than 50% of the plant height is removed.

Seeding Maintenance Log: Contractor shall submit a written record to the Agency Contact that document regular maintenance visits and actions performed. Failure of Contractor to provide documentation of regular required landscape maintenance duties, and resultant native plant death, will result in re-seeding or re-planting at full cost to Contractor per the native seeded area Warranty.

## END OF SECTION