SECTION 32 11 23.33
DENSE GRADED BASE
BASED ON DFD MASTER SPECIFICATION DATED 12/30/2022

PART 1 - GENERAL

SCOPE

The work under this section consists of constructing a dense graded base using crushed stone or crushed gravel. The Contractor may also use crushed concrete, reclaimed asphaltic pavement, reprocessed material, or blended material. The work under this section shall provide a surface ready for constructing and supporting the Concrete or Asphalt Pavement.

PART 1 - GENERAL
- Scope
- Related Work
- Reference Standards
- Quality Assurance
- Submittals

PART 2 - MATERIALS
- Dense Graded Base

PART 3 - EXECUTION
- Construction
- Compaction
- Cleanup

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Related work specified elsewhere:
Section 03 30 00 – Cast In Place Concrete
Section 30 05 00 – Common Work Results For Exterior Work
Section 32 12 16.13 -- Hot Mix Asphalt Paving

REFERENCE STANDARDS

American Society for Testing and Materials (ASTM):

D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods
E329	Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

QUALITY ASSURANCE

The Contractor shall conduct sampling, testing, and analysis as required by this section and elsewhere in the Contract Documents either by retaining the services of an independent construction materials testing consultant or with internal certified testers. The materials testing personnel shall meet the requirements of ASTM E329.

The Contractor's construction materials testing personnel shall complete material testing as outlined in Table 32 11 23.33-1.

Table 32 11 23.33 -1

Material	Test Required	Test/Sample Frequency
i.e. 1¼-inch Base Aggregate Dense	*ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort*	*1 test/500 CY placed*
i.e. 1¼-inch Base Aggregate Dense	*ASTM D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods*	*1 test/500 CY placed*

SUBMITTALS

Provide copies of all material testing reports completed for the project within 48 hours of completing the individual tests. Along with each individual test result, provide a running spreadsheet of all individual test results.

PART 2 - MATERIALS

DENSE GRADED BASE

Use dense graded base (1-1/4 inch for HMA pavement and concrete pavement, 3 inch for gravel parking). Provide aggregate conforming to WisDOT Section 301.2 of the SSHSC for crushed stone, crushed gravel, crushed concrete, reclaimed asphaltic pavement, reprocessed material or blended material. Material gradations shall conform to WisDOT Section 305.2.2 of the SSHSC unless specified elsewhere in the contract documents.

PART 3 - EXECUTION

CONSTRUCTION

Preparing the Foundation

Refer to Section 31 22 16.15 – Roadway Subgrade Preparation.

Placing Dense Graded Base Aggregate

Construct Dense Graded Base as specified in WisDOT Section 305.3 of the SSHSC. Compact each base layer, including shoulder foreslopes, with equipment specified in WisDOT Section 301.3.1 of the SSHSC.

Use standard compaction conforming to WisDOT Section 301.3.4.2 of the SSHSC, unless otherwise specified herein. Final shaping of shoulder foreslopes does not require compaction.

Construct the base to the width and section the drawings show. Shape, and compact the base surface to within 0.04 feet of the drawing elevation.

Ensure there is adequate moisture in the aggregate during placing, shaping, and compacting to prevent segregation and achieve adequate compaction. Moisture condition dense graded base as necessary to achieve required density as determined by ASTM D1557.

Excavation shall be reasonably free of water prior to placement of dense graded base. Do not place dense graded base on frozen surfaces or use frozen material.

Maintain the base until paving over it, or until the DFD Project Representative accepts the work, if paving is not part of the contract.

COMPACTION

Compacting Dense Graded Base Aggregate

If using a pneumatic roller, do not exceed a compacted thickness of 6 inches per layer. For the first layer placed over a loose sandy subgrade, the Contractor may, with A/E approval, increase the compacted layer thickness to 8 inches. If using a vibratory roller, do not exceed a compacted thickness of 8 inches per layer.

The material shall be compacted to meet the following:

Test Method to determine maximum density and moisture	ASTM D1557
Relative compaction relative to the optimum	95%
Moisture content relative to the optimum	-2% to +2%

The compacted material shall be tested for in-place field density in accordance with this Section, Part I, Quality Assurance.

CLEANUP

After the project is completed, thoroughly clean up all debris which may have accumulated during the placement of dense graded base and breaker run, if placed. All storm sewer manholes, inlets, and trench drains within the project area shall be inspected in the presence of the DFD Project Representation, the Owner Agency, and the A/E to confirm there is no accumulated debris. The Contractor shall ensure the manholes, inlets, and trench drains are free of water and debris prior to inspection by the parties noted above. Any accumulated debris in the manholes, inlets, and trench drains shall be removed and properly disposed of by the Contractor.

Replace or repair as required, all surfaces and/or landscape features damaged or disturbed under this item of work.

END OF SECTION

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SECTION 32 11 26.17
PULVERIZED AND RE-LAID PAVEMENT
BASED ON DFD MASTER SPECIFICATION DATED 12/30/2022

PART 1 - GENERAL

SCOPE

The work under this section consists of providing all work, materials, labor, equipment, and supervision necessary to perform full depth in-place pulverizing of existing asphalt as provided for in these specifications and on the drawings.

This section describes full depth in-place pulverizing of the existing asphaltic pavement along with a portion of the underlying base and relaying the pulverized material to construct a new base.

Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference Documents

PART 2 - MATERIALS
- Not Used

PART 3 - EXECUTION
- Pulverized and Re-laid Pavement

RELATED WORK

Applicable provisions of Division 01 govern work under this Section.

Related Work Specified Elsewhere:
Section 30 05 00 – Common Work Results For All Exterior Work
Section 32 11 23.33 – Dense Graded Base

REFERENCE DOCUMENTS

Where reference is made to WisDOT or SSHSC in this specification it shall mean the pertinent sections of the Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction (SSHSC), current edition, and all supplemental and interim supplemental and interim specifications.

PART 2 - MATERIALS

Not Used.

PART 3 - EXECUTION

PULVERIZED AND RE-LAID PAVEMENT

Work is to generally be performed as described in WisDOT SSHSC Section 325. Pulverize the full depth of the existing asphaltic pavement until 97 percent or more will pass the 2-inch sieve. Also pulverize the

existing base to the depth the plans show and mix with the pulverized asphaltic pavement. Windrow material as construction operations dictate.

Immediately after pulverizing, relay the material with a paver, grader, or both a paver and grader.

If sufficient material is available at a given location, match the lines, grades, and cross slopes the plans show. If there is insufficient material at a given location, shape the available material to create a smooth profile and cross slope for a good ride. Eliminate localized bumps, depressions, and ruts. The contractor may be required to haul material from one location on the project to another.

Immediately after relaying, compact the re-laid material first with either a rubber tired roller or vibratory padfoot roller and second with a vibratory steel roller. Add water, as required, both before and during compaction. Compact each layer to the extent required for standard compaction under WisDOT SSHSC Subsection 301.3. Use compaction equipment as follows:

1. For a compacted lift of 6 inches or less, use equipment as specified in SSHSC subsection 301.3.1.
2. 2. For a compacted lift from 6 to 8 inches, use a 12.5-ton or heavier vibratory padfoot roller and an 8-ton or heavier vibratory steel roller.
3. 3. For a compacted lift greater than 8 inches, split into lifts less than 8 inches and use the equipment specified for those lift thicknesses.

Perform each day's pulverize and relay operations to avoid leaving abrupt longitudinal differences between adjacent lanes. Grade shoulders adjacent to pulverized areas by the end of each work day to provide positive drainage of the pavement. Repair surface damage caused by intervening construction or public traffic immediately before paving as necessary to provide a good riding pavement.

END OF SECTION

SECTION 32 12 16.13
HOT MIX ASPHALT PAVING
BASED ON DFD MASTER SPECIFICATION DATED 12/30/2022

PART 1 - GENERAL

SCOPE

The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to provide and construct the paving and surfacing as provided for in these specifications and on the drawings. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Reference Documents
- Quality Assurance
- Submittals

PART 2 - MATERIALS
- Recycled Products and Materials
- Hot Mix Asphalt (HMA) Pavement
- Tack Coat

PART 3 - EXECUTION
- Hot Mix Asphalt (HMA) Pavement
- Pavement Repairs

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Related Work Specified Elsewhere:
Section 30 05 00 – Common Work Results for all Exterior Work
Section 32 11 23.33 – Dense Graded Base

REFERENCE DOCUMENTS

Where reference is made to WisDOT or SSHSC in this specification it shall mean the pertinent sections of the Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction (SSHSC), current edition, and all supplemental and interim supplemental and interim specifications.

QUALITY ASSURANCE

The Contractor is to conduct sampling, testing, and analysis as required by this section and elsewhere in the Contract Documents by retaining the services of an independent construction materials testing firm acceptable to DFD. Contractor must maintain a quality control program in accordance with WisDOT SSHSC Section 701 General QMP Requirements and Section 460.2.8 Quality Management Program to ensure that the asphalt produced meets the specified mix design and plan requirements.

The Contractor’s construction materials testing personnel must complete non-destructive nuclear density testing as outlined in Table 32 12 16.13-1. Test results shall be provided to A/E and DFD Construction Representative within 24 hours of being completed. All densities shall meet the requirements outlined in WisDOT SSHSC Subsection 460.3.3

Table 32 12 16.13 - 1

Layer	Test/Sample Frequency
Lower	*3 random tests/5000 SF placed*
Upper	*1 random test/5000 SF placed*

If density is below specified amount, submit proposed corrective action to DFD Project Representative. Corrective action may consist of removal and replacement of deficient pavement or reduced payment, as agreed to by the DFD Project Representative.

SUBMITTALS

Provide HMA pavement mix design reports for all mix designs to be used on the project. All mix designs shall meet the requirements outlined in WisDOT SSHSC Sections 450 and 460, and shall be listed on the current WisDOT Approved Mix Design List.

PART 2 - MATERIALS

RECYCLED PRODUCTS AND MATERIALS

The Wisconsin Department of Administration, Division of Facilities Development (DFD) strongly encourages the use of recycled materials and products containing recycled materials. Bidders and Contractors may submit specifications for recycled materials and products containing recycled materials for consideration by the DFD for use on the project as part of the submittal process following the contract award.

HOT MIX ASPHALTIC (HMA) PAVEMENT

Provide HMA pavement thickness and type as indicated on the plan and conforming to the requirements of WisDOT SSHSC Section 450 and Section 460. Utilize the same material type throughout the paving operation unless noted elsewhere on the drawings. Ensure all asphaltic materials provided under this section conform to the requirements of WisDOT SSHSC Section 455 and as revised in any current Supplemental Specifications.

TACK COAT

Apply tack coat at a minimum rate of 0.05 gallons per square yard to the lower layer(s) of HMA pavement surface prior to placing upper layer(s) of HMA pavement, unless otherwise noted. Apply at rate of 0.07 gallons per square yard where tack coat is being applied to a milled surface or other hard rigid surface. The surface shall be clean and dry prior to tack coat application. Tack coat shall require a minimum asphalt content of 50% and meet all other requirements of the WisDOT SSHSC Section 455.

PART 3 - EXECUTION

HOT MIX ASPHALT (HMA) PAVEMENT

Complete all work under this section to WisDOT SSHSC Section 450 and Section 460. Provide HMA layer thicknesses as shown on the drawings.

PAVEMENT REPAIRS

Sawcut all pavement surfaces to neat and straight lines at the limits of removal by a two-step method. Limit the initial pavement removal to the immediate area of the proposed work. Full depth sawcutting is not required for this phase of removal. After the work is completed, make a full depth sawcut to neat and straight lines outside the widest point of pavement disruption. Sawcut the lines of the repair parallel to existing joints, or parallel to or perpendicular to pavement edges, to form a neat patch. Carefully remove all remaining pavement within the sawcut area to the lines of the sawcut. Do not disturb the existing base materials between the area disturbed by the work and the sawcut line by the sawcutting, pavement removal, or pavement replacement processes.

Remove all walks, curbs, and other jointed paving by sawcutting at the nearest joint beyond the limits of removal.

Adjust all inlets, manholes, catch basins, valve boxes, and other such castings to match new finished grade as incidental work.

END OF SECTION

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SECTION 32 13 13
CONCRETE PAVING

GENERAL

DESCRIPTION

Work under this section includes all labor, materials, equipment, and services necessary to complete the reinforced cement concrete paving work as shown on the drawings and herein specified.

Related work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

Related Sections

Section 03 10 00 Concrete Forms and Accessories

Section 03 20 00 Concrete Reinforcement

Section 32 11 23 Aggregate Base Course

REFERENCES

Conform to the applicable requirements and recommendations of the following codes, specifications, and standards except as modified by the Contract Documents and herein:

American Concrete Institute, ACI 301-99 "Specifications for Structural Concrete."

American Concrete Institute, ACI 304R-00 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete."

American Concrete Institute, ACI 304.2R - 96 "Placing Concrete by Pumping Methods."

American Concrete Institute, ACI 330R-08 "Guide for the Design and Construction of Concrete Parking Lots."

Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."

Wisconsin Department of Transportation, Standard Specifications, latest edition

Section 415 “Concrete Pavement”

ASTM International, ASTM A 615/ 615M – 01b “Standard Specification for Deformed and Pain Billet-Steel Bars for Concrete Reinforcement.”

ASTM International, ASTM C 114 – 03 “Standard Test Methods for Chemical Analysis of Hydraulic Cement.”

SUBMITTALS

Submittals shall be in accordance with Section 01 33 00 Submittal Procedures.

Concrete Mixture Design: Submit concrete mixture design for each mixture for Design Professional’s review. Obtain Design Professional’s approval of mix before mixing concrete.

For aggregates: Provide types, pit or quarry locations, producers’ names, gradings, specific gravities, and field test data used to establish the required average strength

For Admixtures: Provide types, brand names, producers, manufacturer’s technical data sheets, and certification data

Include alternate design mixtures when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

QUALITY ASSURANCE

Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the

methods needed for proper performance of the work of this Section.

Do not commence placement of concrete until mix designs have been reviewed and approved by the Architect/Engineer and all governmental agencies having jurisdiction and until copies of the approved mix designs are at the job site and the batch plant.

Provide access for, and cooperate with, the inspector and testing laboratory representative.

PRODUCT DELIVERY: STORAGE AND HANDLING

Cement: Store in weather-tight enclosures and protect against dampness, contamination, and warehouse set.

Aggregates:

Stock pile to prevent excessive segregation, or contamination with other materials or other sizes of aggregates.

Use only one supply source for each aggregate stock pile.

Admixtures:

Store to prevent contamination, evaporation or damage.

Protect liquid admixtures from freezing or harmful temperature ranges.

Agitate emulsions prior to use.

ENVIRONMENTAL REQUIREMENTS

Allowable Concrete Temperatures:

Cold weather: Maximum and minimum, ASTM C 94.

Hot weather: Maximum 90`F.

Do not place concrete during rain, sleet or snow unless protection is provided.

PRODUCTS

MATERIALS

Forms and Accessories:

See Section 03 10 00.

Reinforcement:

See Section 03 20 00.

Concrete:

See Section 03 30 00.

Isolation Joint Filler

Provide closed-cell polyethylene foam expansion joint filler, complying with ASTM D 3575.

Comply with ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork in preformed strips.

Dowel Bars and Tie Bars

Shall conform to Wisconsin Department of Transportation, Standard Specifications Section 505

Curing Materials

Spray membrane curing compound

Other Materials

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the

Architect/Engineer.

EQUIPMENT

Meets the requirements of the Wisconsin Department of Transportation, Standard Specifications (latest version) Section 415.3.1.

CONCRETE

Concrete shall conform to the applicable requirements of Section 03 30 00 except as otherwise specified. Concrete shall have a minimum compressive strength of 3500 PSI at 28 days. Maximum size of aggregate shall be 1-½ inches.

Air Content

Mixtures shall have air content by volume of concrete of 5 to 7 percent, based on measurements made immediately after discharge from the mixer.

Slump

The concrete slump shall be 2 inches where determined in accordance with ASTM C 143/ C 143M.

Comply with the following as minimums:

Portland cement: ASTM C 150, Type I or II, low alkali.

Aggregate, general:

ASTM C 330, uniformly graded and clean

Do not use aggregate known to cause excessive shrinkage.

Aggregate, coarse: crushed rock or washed gravel with maximum size between ¾" and 1 ½", and with minimum size number 4.

Aggregate, fine: natural washed sand of hard and durable particles varying from fine to particles passing a 3/8" screen, of which at least 12% shall pass a 50-mesh screen.

Water: Clean and potable

Use only such additives as are recommended in the mix design and approved by the Architect/Engineer and governmental agencies having jurisdiction.

Provide concrete in the proportions established by the approved mix design.

OTHER MATERIALS

Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect/Engineer.

EXECUTION

EXAMINATION

Surface Conditions

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

PREPARATION

Protection

Protect any adjacent surfaces from any spilling from the concrete work.

Final preparation of subgrades

After preparation of subgrade as specified in another Section of these Specifications, thoroughly scarify and sprinkle the entire area to be paved and then compact to a

smooth, hard, even surface of 95% compaction to receive the concrete.

Contractor shall grade subgrade to provide positive drainage away from new building.

Placement of Subbase Course

Subbase:

Spread the specified coarse aggregate to a thickness providing the compacted thickness shown on the Drawings.

Compact to 95% modified proctor.

Thickness tolerance: Provide the compacted thickness shown on the Drawings within a tolerance of minus 0.0" to plus 0.5".

Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 0.05 feet vertically and 1" in alignment at any point.

Correct deviations by removing materials, replacing with new materials and reworking or recompacting as required.

Use only the amount of moisture needed to achieve the specified compaction.

INSTALLATION

Upon completion of base course and formwork, install reinforcement (if required) as shown on the Drawings.

Clean reinforcement to remove loose rust and mill scale, earth and other materials which reduce bond or destroy bond with concrete.

Position, support and secure reinforcement against displacement by formwork, construction and concrete placement operations.

Place reinforcement to obtain the required coverage for concrete protection.

Transit mix the concrete in accordance with provisions of ASTM C 94.

With each load, provide ticket certifying to the materials and quantities and to compliance with the approved mix design.

On the transit-mix ticket, state the time water was first added to the mix.

At the batch plant, withhold 2-½ gal of water per cu yd of concrete.

Upon arrival at the job site, and as directed by the testing laboratory inspector, add all or part of the withheld water before the concrete is discharged from the mixer.

Mix not less than five minutes after the withheld water has been added and not less than one minute of that time immediately prior to discharge of the batch.

Unless otherwise directed provide 15 minutes total mixing time per batch after first addition of water.

Do not use concrete that has stood over 30 minutes after leaving the mixer or concrete that is not placed within 60 minutes after water is introduced into the mix.

Conveying:

Place concrete in accordance with the following and pertinent recommendations contained in ACI 304.

Deposit concrete continuously in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause formation of seams or planes of weakness within the section.

If a section cannot be placed continuously, provide construction joints as specified herein.

Perform concrete placing at such a rate that concrete which is being integrated with fresh concrete is still plastic.

Deposit concrete as nearly as practicable in its final location so as to avoid segregation due to rehandling and flowing.

Do not subject concrete to any procedure which will cause segregation.

Do not use concrete which becomes non-plastic and unworkable or does not meet required quality control limits or has been contaminated by foreign materials.

Remove rejected concrete from the Site.

Deposit and consolidate concrete in a continuous operation within the limits of construction joints until the placing of a panel or section is completed.

Bring surfaces to the correct level with a straightedge and then strike off.

Use bull floats or darbies to smooth the surface, leaving it free from bumps and hollows.

Do not sprinkle water on the plastic surface. Do not disturb the surfaces prior to start of finishing operations.

Expansion joints:

Do not permit reinforcement to extend continuously through any expansion joint.

Locate expansion joints along the edges of all structures and where indicated, filled to full depth with expansion joint material.

Finishing:

Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation.

During or after the first floating, check the planeness or surface with a ten-foot straightedge applied at not less than two different angles.

Cut down high spots and fill low spots and produce a surface level within ¼" in two feet as determined by a two-foot straightedge placed anywhere on the surface in any direction.

Refloat the surface immediately to a uniform sandy texture.

While the surface is still plastic provide a textured finish by drawing a fiber bristle broom uniformly over the surface.

Unless otherwise directed by the Architect/Engineer provide the texturing in one direction only.

Provide light, medium or course texturing as directed by the Architect/Engineer.

CURING AND PROTECTION

Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical injury.

END OF SECTION

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SECTION 32 17 23
PAVEMENT MARKINGS
BASED ON DFD MASTER SPECIFICATION DATED 09/01/2015

PART 1 - GENERAL

SCOPE

The work under this section consists of providing all work, materials, labor, equipment, and supervision necessary to provide and install pavement markings as provided for in these specifications and on the drawings. Included are the following topics:

PART 1 - GENERAL
- Scope
- Related Work
- Submittals

PART 2 - MATERIALS
- Pavement Markings

PART 3 - EXECUTION
- Pavement Markings

RELATED WORK

Applicable provisions of Division 01 govern work under this Section.

Related Work Specified Elsewhere:
Section 30 05 00 – Common Work Results For All Exterior Improvements

SUBMITTALS

Submit the manufacturer specifications for each pavement marking. The submittal for each material shall include the following at a minimum:

- Pavement Marking Material and Manufacturer
- Color and Batch Number
- Date Manufactured (Material more than one year old will not be accepted)
- Manufacturer Name and Address.

PART 2 - MATERIALS

PAVEMENT MARKINGS

Furnish paint pavement markings conforming to WisDOT Section 646.2 as specified in the drawings.

PART 3 - EXECUTION

PAVEMENT MARKINGS

Prepare surface to receive markings and install them in accordance with WisDOT Section 646.3.

Apply pavement markings at the locations and to the dimensions and colors as shown on the drawings. If not otherwise specified, marking lines shall be yellow and have a minimum width of 4 inches.

Apply pavement markings at a rate per the manufacturers recommended application rate based on the temperature and surface material.

END OF SECTION

SECTION 32 91 13
SOIL PREPARATION

Based On DFD Master Specification Dated 01/07/2023

PART 1 - GENERAL
- Scope
- Related Work
- Reference Standards
- Submittals
- Quality Assurance
- Soil Testing

PART 2 - PRODUCTS
- Topsoil
- Sand
- Fertilizer

PART 3 - EXECUTION
- Site Preparation
- Soil Preparation
- Placing Topsoil

PART 1 - GENERAL

SCOPE

The work under this section shall consist of providing all work, materials, labor, equipment and supervision necessary to provide and prepare soil for seeding, sodding, and planting. Included are the following topics:

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Section 32 92 18 – Seeding
Section 32 94 00 – Planting Accessories and Mulch

REFERENCE STANDARDS

WisDNR S100 Compost Specification

SUBMITTALS

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.

PART 2 - PRODUCTS

TOPSOIL

Use existing soils from on site. If imported topsoil is necessary, provide 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, roots, trash and debris of any kind.

FERTILIZER

Fertilizer: Granular, non-burning product composed of not less than fifty (50) percent slow-acting, guaranteed analysis fertilizer. All fertilizers shall be delivered fully labeled according to applicable regulations, bearing name, trade name or trademark of producer, along with producer's warranty.

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.

SOIL PREPARATION

The following applies to all planted, seeded or sodded areas.

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.

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

> Remove existing vegetation. Do not mix vegetation into surface soil. Loosen existing topsoil 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.

PLACING TOPSOIL

Areas to be seeded or sodded shall have a minimum of 4inches 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.

Limit fine grading to areas that can be seeded in the immediate future. After finish grading, restore any eroded or otherwise disturbed areas before seeding or sodding.

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

END OF SECTION

SECTION 32 91 13.50
STORMWATER INFILTRATION
BASED ON DFD MASTER SPECIFICATION DATED 01/06/2023

PART 1 - GENERAL

SCOPE

The work under this section shall consist of providing all work, materials, labor, equipment and supervision necessary to construct Stormwater Infiltration Devices. Included are the following topics:

PART 1 - GENERAL
- Related Work
- Reference Standards
- Submittals
- Quality Assurance

PART 2 - PRODUCTS
- Compost
- Vegetation
- Mulch
- Erosion Mat

PART 3 - EXECUTION
- Protection Measures
- Temporary Erosion and Sediment Controls
- Excavation
- Engineered Soil
- Erosion Mat
- Planting

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Section 30 05 00 – Common Work Results for All Exterior Improvements
Section 31 20 00 – Earthmoving
Section 31 25 00 – Erosion Control
Section 32 91 13 – Soil Preparation
Section 32 92 19 – Seeding
Section 32 94 00 – Planting Accessories and Mulch
Section 33 40 00 – Storm Drainage Utilities

REFERENCE STANDARDS

WisDNR Standard 1002	Site Evaluation for Stormwater Infiltration
WisDNR Standard 1003	Infiltration Basin
WisDNR S100 Compost	Specification
WisDOT PAL	Wisconsin Erosion Control Product Acceptability List (PAL)
WisDOT SSHSC	Standard Specifications for Highway and Structure Construction

SUBMITTALS

Provide copies of all quality assurance testing reports and certifications:

Field Infiltration Testing: for infiltration device rough-graded areas
Organic Compost Certification
Engineered Soil Certification

Provide product data for the following products:

Pipe
Geotextile Fabrics
Erosion Mat

QUALITY ASSURANCE

Field Infiltration Testing

Immediately after rough grading of infiltration devices, conduct field infiltration testing by a third-party testing agency to verify infiltration rates for all infiltration devices. Field tests shall be conducted using a double-ring infiltrometer per ASTM D3385. Calculate infiltration rates in accordance with WisDNR Site Evaluation for Stormwater Infiltration, Standard 1002. Tests shall be conducted for each 5000 square feet of surface area of the infiltration device or one test per device minimum measured at the design high water level.

Furnish a report of the test results to Architect/Engineer for approval prior to placement of additional interface or storage layer materials in the infiltration device.

Organic Compost Certification

Contractor shall submit, in writing to DFD Project Representative, a certification from compost supplier that organic compost used on the project is in compliance with the requirements outlined in WisDNR Specification S100.

Engineered Soil Certification

Contractor shall submit, in writing to DFD Project Representative, a certification from the engineered soil supplier that engineered soil product supplied for the project is in compliance with the requirements outlined in WisDNR Standard 1003 Infiltration Basin.

PART 2 - PRODUCTS

ORGANIC COMPOST

Well-composted, stable, and weed-free organic matter meeting the requirements of WisDNR S100 Organic Compost Specification.

VEGETATION

Turf grass shall not be used to vegetate the infiltration basin, although may be used in pretreatment areas. See specification section 32 92 20 Native Seeding for additional information.

MULCH

Shredded hardwood mulch or chips per WisDNR Standard 1003.

EROSION MAT

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. Biodegradable materials are intended to avoid entrapment of animals. Erosion mat shall be American Excelsior 'FibreNet', East Coast Erosion Biodegradable jute products, ErosionControlBlanket.com biodegradable leno weave products, North American Green SC150BN, or Western Excelsior 'All Natural' products. Erosion mat shall be equivalent to North American Green SC150BN.

PART 3 - EXECUTION

PROTECTION MEASURES

Pre-Installation Meeting

Prior to the installation of the infiltration device, the Architect/Engineer, DFD Construction representative, and the contractor shall conduct a pre-installation meeting to ensure compliance with WisDNR Standard 1003 for all construction and planting procedures.

Stabilization

Construction of the infiltration device shall not begin until after the contributing drainage area has been stabilized with vegetation and/or hardscapes. Construction site runoff from disturbed areas shall not be allowed to enter the infiltration device.

Weather

Construction shall be suspended during periods of rainfall or snowmelt. Construction shall remain suspended if ponded water is present or if residual soil moisture contributes significantly to the potential for soil smearing, clumping, or other forms of compaction.

Delays resultant from weather shall not serve as a basis for a change order.

Compaction Avoidance

Compaction and smearing of the soils beneath the floor and side slopes of the infiltration device area, and compaction of the soils used for backfill shall be minimized.

During construction, the area dedicated to the infiltration device shall be cordoned off to prevent access by heavy equipment.

Acceptable equipment for constructing the infiltration device includes excavation hoes, light equipment with turf type tires, marsh equipment, or wide-track loaders.

Compaction Remediation

If compaction occurs at the base of the infiltration device, the soil shall be refractured to a depth of at least 12-inches.

If smearing occurs the smeared areas shall be corrected by raking or rototilling.

Compaction and smearing remediation shall be conducted by the contractor at no additional cost to the Owner.

TEMPORARY EROSION AND SEDIMENT CONTROLS

Prior to beginning construction, the Contractor shall install temporary erosion and sediment controls around the perimeter of the infiltration device area, to protect from siltation or contamination from adjacent landscape or paved surfaces and construction activities.

Leave erosion control in place until plant establishment and construction activities are complete.

EXCAVATION

Excavation equipment shall work from the upper edges of the infiltration devices to excavate the areas to the depths and dimensions as shown on the Drawings. Excavation equipment shall have adequate reach such that it does not need to be located within the footprint of the infiltration device to remove material.

Upon excavation to the depth indicated in the drawings, the Contractor shall fracture the swale or basin bottom soils to a depth of 12 inches to promote greater infiltration or to reach a permeable sub layer.

PLANTING

Contractor shall follow the applicable planting requirements per specification section 32 92 20 Native Seeding.

END OF SECTION

SECTION 32 92 19
SEEDING
Based On DFD Master Specification Dated 01/06/2023

PART 1 - GENERAL
- Scope
- Related Work
- Reference Standards
- Submittals
- Quality Assurance
- Delivery, Storage, and Handling
- Installation Schedule
- Job Conditions
- Warranty

PART 2 - PRODUCTS
- Lawn Seed
- Water
- Topsoil
- Mulch
- Erosion Control Measures
- Amended Topsoil

PART 3 - EXECUTION
- Site Preparation
- Soil Preparation
- Placing Topsoil
- Fertilizer Amendments
- Seeding
- Mulching
- Cleaning and Repair
- Maintenance
- Seeding Acceptance

PART 1 - GENERAL

SCOPE

The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to complete lawn seeding, mulching, and lawn 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

REFERENCE STANDARDS

Association of Official Seed Analysts (AOSA)

SUBMITTALS

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.

Proposed Fertilizer to be submitted prior to purchase

Fertilizer Label: Contractor to provide tag from product packaging

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

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

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 in a manner safe from damage from heat, moisture, rodents, or other causes. Any seed damaged after acceptance shall be replaced by the Contractor at his / her expense.

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

Coordinate installation periods with on-going maintenance requirements throughout sodding operations.

Weather Limitations: Proceed with seed installation only when existing and forecasted weather conditions permit. No seeding shall occur on frozen ground or at air temperatures lower than 32^{o} 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.

WARRANTY

Contractor shall warranty the establishment of a satisfactory seeded lawn for a minimum of one growing season after date of 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 seeded lawn: At end of the warranty period, a healthy, uniform, and dense stand of grass has been established per Lawn Seeding Acceptance below.

Contractor shall re-seed and maintain lawn areas that do not comply with requirements until lawns are satisfactory at the Contractor's expense.

Contractor shall provide an additional period of lawn maintenance following any actions needed to re-seed 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 lawn areas not caused by Contractor shall be excluded from Warranty. Such damage shall include ruts caused by driving vehicles over lawns, excavation and backfill work in lawn areas, damage from animals, 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

LAWN SEED

Fresh, clean, dry, new seed 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. Variety Not Stated (VNS) seed is not permitted.
Seed shall have been test within the last 9 months and contain the following properties:

Purity	>90%
Germination	>85%
Other Crop	<0.5%
Weed Seed	<0.5%
Noxious Weeds	None
Inert Matter	<8%

Annual ryegrass shall not be permitted in lawn seed mixtures, except as a temporary cover for erosion control.

For Sun and Partial Shade areas, proportioned by weight as follows:

Kentucky Bluegrass / Fine Fescue / Perennial Ryegrass Blend

40 percent Kentucky bluegrass (at least two varieties)
40 percent fine fescue including Chewings fescue, creeping red fescue, or hard fescue
No more than 20 percent perennial ryegrass

WATER

Water to be free of wastewater effluent or other hazardous chemicals.

TOPSOIL

Use existing soils from on site. If imported topsoil is necessary, provide 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 , roots, trash and debris of any kind.

FERTILIZER

Fertilizer: Granular product composed of not less than fifty (50) percent slow-acting, guaranteed analysis fertilizer. All fertilizers shall be delivered fully labeled according to applicable regulations, bearing name and trade name or trademark of producer.

Starter Fertilizer: shall be composed of nitrogen, phosphorus and potassium with higher phosphorus ratio than found in maintenance fertilizers.

Maintenance Fertilizer: shall have nutrient ratios of nitrogen, phosphorus, and potassium to support any deficiencies indicated by soil-testing analysis.

All fertilizers shall be delivered fully labeled according to applicable regulations, bearing name, trade name or trademark of producer, along with producer's warranty.

MULCH

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

Hydro Mulch: wood fiber mulch with or without tackifier.

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. Biodegradable materials are intended to avoid entrapment of animals. Erosion mat shall be American Excelsior 'FibreNet', East Coast Erosion Biodegradable jute products, ErosionControlBlanket.com biodegradable leno weave products, North American Green SC150BN, or Western Excelsior 'All Natural' products. Erosion mat shall be equivalent to North American Green SC150BN.

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.

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.

SEEDING

Methods of seed installation may vary at the discretion of the Contractor in order to establish and guarantee a smooth, uniform quality lawn. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

Install seed mixes at manufacturer's recommended rates.

Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.

MULCHING

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.

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.

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 moist soil to a depth of at least 2 inches. Seed installation shall be watered unless natural rainfall precludes the need for specific visits. During periods of hot weather (higher than 80º-85ºF), the seed installation may need additional irrigation.

Contractor to replace any mulch and/or seed that has been blown or washed away.

Fertilizing: Apply maintenance fertilizer with a mechanical rotary or drop-type distributor approximately thirty (30) days after seed installation, at manufacturer's recommended rate, and thoroughly water into the soil.

Contractor shall remove all weeds by the roots on a bi-weekly basis. Use of herbicide for weed-control shall be requested by Contractor, and allowed only with approval by Owner in writing.

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.

Mowing: The first mowing shall not be performed until the lawn has grown to a height of approximately 3 to 4 inches. Lawn shall be mown as often as necessary to maintain a height of 2-1/2 to 4 inches. No more than one third of the height of grass leaf shall be removed during any single mowing operation. The mowing operation is to include trimming around obstacles and the removal of excess grass clippings.

Line trimmers shall not be used around tree trunks.

Seeding Maintenance Log: Contractor shall submit a written record to the DFD Construction Representative that documents regular maintenance visits and actions performed. Failure of Contractor to provide documentation of regular required landscape maintenance duties, and resultant unsuccessful lawn establishment, will result in lawn re-seeding at full cost to Contractor per the seeding Warranty.

Contractor shall inform Owner when required maintenance period has concluded.

SEEDING ACCEPTANCE

The DFD Construction Representative and the Architect/Engineer shall perform inspections with the Contractor at the conclusion of the installation operations to verify that seeded lawn areas have been satisfactorily established.

A satisfactory installation shall meet the following requirements:

- An established root system (leaf blades break before seedlings can be pulled from the soil by hand)
- Uniform coverage throughout all turf areas with no bare spots larger than 5 inches by 5 inches
- No bare areas comprising more than 1% of any given 1,000 square foot area
- No deformation of the turf areas caused by mowing or other Contractor equipment
- Shall be free of weeds, disease and harmful pests

Request for Inspection: Contractor shall submit a request for inspection to the DFD Construction Representative and Architect/Engineer. The request shall be received at least 7 (seven) days before the anticipated date of inspection.

Contractor shall re-seed lawn areas that do not comply with requirements, and continue required maintenance until lawns are satisfactory.

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 provisions of the Warranty.

END OF SECTION

SECTION 32 92 20
NATIVE SEEDING

Based On DFD Master Specification Dated 01/06/2023

PART 1 - GENERAL
- Scope
- Related Work
- Reference Standards
- Submittals
- Quality Assurance
- Delivery, Storage and Handling
- Equipment Weed Control
- Installation Schedule
- Job Conditions
- Warranty

PART 2 - PRODUCTS
- Native Seed
- Nurse Crop
- Water
- Topsoil
- Sand
- Mulch
- Erosion Control Blanket
- Erosion Control Fiber Mesh
- Nonselective Herbicides

PART 3 - EXECUTION
- Site Preparation
- Seeding
- Mulching and Erosion Control
- Seeding Acceptance
- Cleaning and Repair
- Maintenance

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

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.

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

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

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 32° 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.

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.

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 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. Lupinus perennis is required in seed mix. 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 - Stormwater Infiltration 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. The 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
Marsh / Red Milkweed	Asclepias incarnata
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
Great Blue Lobelia	Lobelia siphilitica
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
Golden Alexanders	Zizia aurea

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

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

Use existing soils from on site. If imported topsoil is necessary, provide 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 roots, trash and debris of any kind.

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. Biodegradable materials are intended to avoid entrapment of animals. Erosion mat shall be American Excelsior 'FibreNet', East Coast Erosion Biodegradable jute products, ErosionControlBlanket.com biodegradable leno weave products, North American Green SC150BN, or Western Excelsior 'All Natural' products. Erosion mat shall be equivalent to North American Green SC150BN.

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.

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.

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 infiltration areas a biodegradable erosion mat is required to prevent movement of soil 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/Engineer shall 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.

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

SECTION 32 94 00
PLANTING ACCESSORIES AND MULCH
Based On DFD Master Specification Dated 01/06/2023

PART 1 - GENERAL
- Scope
- Related Work
- Reference Standards
- Submittals
- Quality Assurance
- Installer Qualifications
- Job Conditions

PART 2 - PRODUCTS
- Stone Mulch
- Weed Control Fabric
- Landscape Edging

PART 3 - EXECUTION
- Site Preparation
- Placing Weed Fabric and Mulch
- Edging Installation
- Cleaning and Repair

PART 1 - GENERAL

SCOPE

The work under this section shall consist of providing all work, materials, labor, equipment, and supervision necessary to complete planting of trees, shrubs, ground covers, perennials, annuals, and bulbs, and required maintenance activities of pruning, weeding, and watering.

RELATED WORK

Applicable provisions of Division 1 govern work under this Section.

Section 31 25 00 – Erosion Control
Section 32 91 13 - Soil Preparation
Section 32 91 13 5 – Stormwater Infiltration
Section 32 92 18 – Seeding

REFERENCE STANDARDS

ANSI Z60.1	American Standards for Nursery Stock
ANSI A300	American National Standard for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance-Standard Practices
WisDNR S100	Compost Specification

SUBMITTALS

Provide copies of all quality assurance test 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.

QUALITY ASSURANCE

JOB CONDITIONS

Protect all plants and lawn areas from damage at all times. Plants or lawn areas damaged during construction shall be replaced, repaired, or treated as required to conform with specifications for fresh stock.

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.

PART 2 - PRODUCTS

STONE MULCH

Washed Stone ranging in size from 3 in minimum diameter, clean and free of organic matter. Provide sample to Architect/Engineer for approval.

WEED CONTROL FABRIC

Spun-bonded, rot-resistant polypropylene fabric, water and air permeable, and unaffected by freezing and thawing, or by deterioration from fertilizers or pesticides.

LANDSCAPE EDGING

Aluminum Edging: Standard-profile extruded-aluminum edging, ASTM B 221 (ASTM B 221M), Alloy 6063-T6, fabricated in standard lengths with interlocking sections with loops stamped from face of sections to receive stakes.

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.

Contractor shall locate all utilities, including irrigation systems, prior to excavation. Contact Digger’s Hotline to coordinate locating of underground utilities prior to excavation or soil preparation.

EDGING INSTALLATION

Landscape Edging: Install per manufacturer's instructions.

CLEANING AND REPAIR

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

END OF SECTION