SECTION 102239 - FOLDING PANEL PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Operable acoustical panel partitions.

B. Related Sections:
   1. Section 013573 - Delegated Design Requirements and Procedures.

1.2 DEFINITIONS

A. NIC: Noise Isolation Class.

B. NRC: Noise Reduction Coefficient.

C. STC: Sound Transmission Class.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data:
   1. Operable acoustical panel partitions.

B. Sustainable Design Submittals:

   1. Product Data: For recycled content, indicating postconsumer and pre-consumer recycled content and cost.
   2. Product Data: Product Data: Environmental Product Declaration (EPD).
   3. Product Data: Material Ingredient Documentation.
   4. Product Data: for wall panel products indicating compliance with General Emissions Evaluation.
   5. Product Data: For insulation products indicating compliance with General Emissions Evaluation.
   6. Product Data: For adhesives, sealants, and coatings indicating compliance with General Emissions Evaluation and VOC content requirements.
   7. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For operable panel partitions.
   1. Include plans, elevations, sections, attachment details, and numbered panel installation sequence.
   2. Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.

D. Samples for Initial Selection: For each type of exposed material, finish, covering, or facing.
   1. Include Samples of accessories involving color selection.

E. Samples for Verification: For each type of exposed material, finish, covering, or facing, prepared on Samples of size indicated below:

   1. Textile Facing Material: Full width by not less than 36-inch- long section of fabric from dye lot to be used for the Work, with specified treatments applied. Show complete pattern repeat.

   2. Panel Edge Material: Not less than 3 inches long.
   3. Hardware: One of each exposed door-operating device.

F. Delegated Design Submittals: Refer to Section 013573 "Delegated Design Requirements and Procedures" for delegated design submittal procedures and requirements.
   1. Provide delegated design submittals for:
      a. Operable panel partitions.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Partition track, track supports and bracing, switches, turning space, and storage layout.
   2. Suspended ceiling components.
   3. Structural members to which suspension systems will be attached.
   4. Size and location of initial access modules for acoustical tile.
   5. Items penetrating finished ceiling including the following:
      a. Lighting fixtures.
      b. HVAC ductwork, outlets, and inlets.
      c. Speakers.
      d. Sprinklers.
      e. Smoke detectors.
      f. Access panels.
   6. Plenum fire, smoke, and acoustical barriers.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For operable panel partitions to include in maintenance manuals.
   1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
      a. Panel finish facings and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.

b. Seals, hardware, track, track switches, carriers, and other operating components.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same production run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Panel Finish-Facing Material: Furnish full width in quantity to cover both sides of two panels when installed.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Provide the following upon request:

1. Setting Drawings: For embedded items and cutouts required in other work, including support-beam, mounting-hole template.

2. Qualification Data: For Installer and testing agency.

3. Product Certificates: For each type of operable panel partition.

a. Include approval letter signed by manufacturer acknowledging Owner-furnished panel facing material complies with requirements.

4. Product Test Reports: For each operable panel partition, for tests performed by a qualified testing agency.

5. Field quality-control reports.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Faulty operation of operable panel partitions.
   b. Deterioration of metals, metal finishes, and other materials beyond normal use.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a registered design professional, as defined in Section 013573 "Delegated Design Requirements and Procedures" to design seismic bracing of tracks to structure above.
   1. Material properties indicated in this Section shall be considered as minimum properties.

B. Seismic Performance: Operable panel partitions are to withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7.

   1. The term "withstand" means "the partition panels will remain in place without separation of any parts when subjected to the seismic forces specified."

C. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties in accordance with test methods indicated:

   1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance in accordance with ASTM E90, determined by ASTM E413, and rated for not less than the STC indicated.

   2. Noise-Reduction Requirements: Operable panel partition assembly, identical to partition tested for STC, tested for sound-absorption performance in accordance with ASTM C423, and rated for not less than the NRC indicated.

   3. Noise-Isolation Requirements: Installed operable panel partition assembly, identical to partition tested for STC, tested for NIC in accordance with ASTM E336, determined by ASTM E413, and rated for 10 dB less than STC value indicated.

D. Fire-Test-Response Characteristics: Provide panels with finishes complying with one of the following as determined by testing identical products by a testing and inspecting agency acceptable to authorities having jurisdiction:
   1. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

      a. Flame-Spread Index: 25 or less.
      b. Smoke-Developed Index: 450 or less.
   2. Fire Growth Contribution: Complying with acceptance criteria of local code and authorities having jurisdiction when tested in accordance with NFPA 265 Method B Protocol or NFPA 286.

2.2 OPERABLE ACOUSTICAL PANEL PARTITIONS

A. Operable Acoustical Panel Partitions: Partition system, including panels, seals, finish facing, suspension system, operators, and accessories.

B. Panel Operation: Manually operated, ~~**continuous hinged**~~ **paired panels** **(Add. C)**

C. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.

D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.

1. Panel Width: Standard widths.

E. STC: Not less than 38.

F. NRC: Not less than 0.50.

G. Panel Materials:

1. Recycled Content: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.
2. Environmental Product Declaration: Provide Type III Industry-Wide Environmental Product Declaration with external verification in the manufacture is recognized as a participant by the program operator in accordance with ISO 14025, and EN15804 or ISO 21930 and that has a cradle to gate scope.
3. Material Ingredients: Documentation that demonstrates the chemical inventory of the product to at least 0.1 percent (1000 ppm).
4. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
5. Adhesives: Do not use adhesives that contain urea formaldehyde.
6. Steel Frame: Steel sheet, manufacturer's standard nominal minimum thickness for uncoated steel.
7. Steel Face/Liner Sheets: Tension-leveled steel sheet, manufacturer's standard minimum nominal thickness for uncoated steel.
8. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; ASTM B221 for extrusions; manufacturer's standard strengths and thicknesses for type of use.

a. Frame Reinforcement: Manufacturer's standard steel or aluminum.

H. Panel Closure: Manufacturer's standard unless otherwise indicated.

1. Initial Closure: Resilient, bulb-shaped acoustical seal.

2. Final Closure: Constant-force, lever-operated mechanical closure expanding from panel edge to create a constant-pressure acoustical seal.

I. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

1. Hinges: Manufacturer's standard.

J. Finish Facing: Fabric wall covering.

2.3 SEALS

A. Description: Seals that produce operable panel partitions complying with performance requirements and the following:
1. Manufacturer's standard seals unless otherwise indicated.
2. Seals made from materials and in profiles that minimize sound leakage.
3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.

B. Vertical Seals: Deep-nesting, interlocking astragals mounted on each edge of panel, with continuous, resilient acoustical seal.

C. Horizontal Top Seals: Continuous-contact, resilient seal exerting uniform constant pressure on track.

D. Horizontal Bottom Seals:

1. Resilient, mechanical, retractable, constant-force-contact seal exerting uniform constant pressure on floor when extended, ensuring horizontal and vertical sealing and resisting panel movement.

a. Mechanically Operated for Acoustical Panels: Extension and retraction of bottom seal by operating handle or built-in operating mechanism, with operating range not less than 2 inches between retracted seal and floor finish.

2.4 PANEL FINISH FACINGS

A. Description: Finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.

1. Apply one-piece, seamless facings free of air bubbles, wrinkles, blisters, and other defects, with no gaps or overlaps. Horizontal seams are not permitted. Tightly secure and conceal raw and selvage edges of facing for finished appearance.

2. Where facings with directional or repeating patterns or directional weave are indicated, mark facing top and attach facing in same direction.
3. Match facing pattern 72 inches above finished floor.

B. Fabric Wall Covering: Manufacturer's standard fabric, from same dye lot, treated to resist stains.
1. Color/Pattern: Match Architect's samples.

C. Cap-Trimmed Edges: Protective perimeter-edge trim with tight hairline joints concealing edges of panel and finish facing, finished as follows:

1. Aluminum: Finished with manufacturer's standard clear anodic finish.

2.5 SUSPENSION SYSTEMS

A. Tracks: Steel or aluminum mounted directly to overhead structural support, designed for operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.

1. Panel Guide: Aluminum guide on both sides of the track to facilitate straightening of the panels; finished with factory-applied, decorative, protective finish.

2. Head Closure Trim: As required for acoustical performance; with factory-applied, decorative, protective finish.

B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.

C. Track Intersections, Switches, and Accessories: As required for operation, storage, track configuration, and layout indicated for operable panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.

1. Center carrier stop.

D. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish unless otherwise indicated.

E. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine flooring, floor levelness, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF OPERABLE PANEL PARTITIONS

A. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.

B. Install panels in numbered sequence indicated on Shop Drawings.

C. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

D. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.

E. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids. Adjust partitions for alignment and full closure of vertical joints and full closure along top and bottom seals. Perform test and make adjustments before NIC testing.

3.3 FIELD QUALITY CONTROL

A. NIC Testing: Owner will engage through the Contractor a qualified testing agency to perform tests and inspections.

1. Testing Extent: Testing agency is to randomly select one operable panel partition installation(s) for testing.
2. Testing Methodology: Perform testing of installed operable panel partition for noise isolation in accordance with ASTM E336, determined by ASTM E413, and rated for not less than NIC indicated. Adjust and fit partitions to comply with NIC test method requirements.

B. An operable panel partition installation will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust operable panel partitions, hardware, and other moving parts to function smoothly, and lubricate as recommended by manufacturer.

B. Adjust to operate smoothly and easily, without binding or warping.

C. Verify that safety devices are properly functioning.

3.5 MAINTENANCE SERVICE

A. Maintenance Service: Beginning at Substantial Completion, maintenance service is to include 12 months' full maintenance by manufacturer's authorized service representative. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operable-partition operation. Parts and supplies are to be manufacturer's authorized replacement parts and supplies.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION

SECTION 329220 - NATIVE SEEDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Procurement, scheduling, installation, maintenance, and warranty of all native seeding in accordance with the plans and as specified herein.

B. Related Requirements:
1. Section 329100 "Soil Preparation (Topsoil)" for topsoil for native seeded areas.
2. Section 329300 "Exterior Plantings" for trees, shrubs, groundcovers, and other plants.

1.2 REFERENCES

A. Association of Official Seed Analysts, as referenced as AOSA.

B. Regulatory Requirements:
1. Arizona State Seed Law.

1.3 ACTION SUBMITTALS

A. Product Data:
1. Within 4 weeks following the issuance of the Notice to Proceed, submit name and location of seed supplier(s) and a complete list of each seed mix by weight and proportion that is being supplied before the seed mix is ordered. Substitutions will not be permitted unless reviewed and approved by Landscape Architect.
2. **Geographic origins of each seed species. (Add. C)**
3. Method of seeding, including all equipment to be used and manufacturer's specifications for care and handling.
4. Tackifier: Manufacturer's specifications and recommended rates of application.
5. **Erosion control blankets, including anchor. (Add. C)**
6. **Jute mesh/jute netting, including anchor. (Add. C)**
7. **Mycorrhizal inoculum: Manufacturer's specifications and recommended rate of application. (Add. C)**

B. Source Quality Control:
1. **Samples:**
   a. **Straw mulch – one gallon bag. (Add. C)**
2. Certifications:
   a. Test Reports: Prior to delivery of products to the site, submit the following:
      1) Seed viability: Pure Live Seed (PLS) test reports for each species; tetrazolium (TZ) testing only conducted by a qualified independent testing laboratory.
      2) Seed purity: Test reports for each species.
      3) **Topsoil: Certified test report for soil preparation (Section 329100 Topsoil) (Add. C)**

C. Field Quality Control:
1. Maintenance Plan: Prior to the issuance of Substantial Completion, submit detailed methodology and schedules for warranty maintenance of native seeded areas including irrigation, weed control, and invasive species eradication. See

Part 1.7 "Maintenance". Coordinate native seeding maintenance with other applicable Sections (Planting, Irrigation, etc.).

2. Maintenance Report Forms: Submit Maintenance Report Forms following completion of each maintenance visit. The forms shall cross-reference the Maintenance Plan. Payment for this work will only be made by the Owner when proof of completed work has been provided.
3. **Schedule: Within 4 weeks following the issuance of the Notice to Proceed, submit a project work schedule to the Landscape Architect indicating the dates of each of the following events: (Add. C)**
   a. Seed installation – verify compliance with seeding schedule for mix. (Add. C)
   b. Substantial Completion of Work – verify compliance with seeding schedule for mix. (Add. C)

1.4 INFORMATION SUBMITTALS

A. Qualification Data:
   1. Include a list of at least 3 similar projects completed in the last 5 years by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owner's contact persons.
   2. License certificate for pesticide applicators.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. The work of this section (installation and maintenance) shall be performed by a Contractor specializing in native seeding and having a minimum of 5 years' experience in projects of the scope and scale being specified.

1.6 DELIVERY, STORAGE, AND HANDLING

A. All seeds shall be packaged and kept dry to ensure adequate protection against damage and to maintain dormancy while in transit, storage, or during planting operations.

B. All seed shall be delivered to the site in sealed containers and labeled, in compliance with the Federal Seed Act and applicable State laws.

C. Seed shall not be delivered and stored longer than 9 months before installation.

D. Herbicides and other chemicals delivered to site must be in clearly labeled, unopened containers showing weight, analysis, and name of manufacturer.

E. Straw mulch shall be stored off the ground under a cover that provides protection from moisture and humidity.

1.7 SCHEDULING

A. Seeding Season
   1. Seeding of Native Seed Mix shall occur during the early spring - **March 15** through May 15, **weather permitting and not during periods of overnight freezing temperatures. (Add. C)**
   ~~**2. Seeding of Native Seed Mix shall occur during the dormant winter months -**~~

~~November 15 through February 15.~~ (Add. C)

a. Do not apply onto snow-covered ground.

b. If the site is final graded before the dormant season, following final grading approval, stabilize the site until seeding can occur with ~~the~~ approved erosion control ~~seed mix listed below:~~ measures. (Add. C)

~~1) May 15 through September 1: 96 pounds per acre of seed oats (Avena sativa).~~ (Add. C)

~~2) September 1 through October 15: 90 pounds per acre winter wheat (Triticum aestivum) or Regreen Sterile Wheat/Wheatgrass Hybrid (Triticum aestivum x Elytrigia elongatafrom).~~ (Add. C)

~~3. Native Seed Mix – Two-step installation, Spring Seeding:~~ (Add. C)

~~a. Step 1: Installation of the Native Grasses Seed Mix shall occur between April 1, through May 15.~~ (Add. C)

~~1) Perform broadleaf herbicide applications as specified in to the Native Grasses seeded areas to eliminate broadleaf weeds.~~ (Add. C)

~~b. Step 2: Installation of the Native Forbs Seed Mix shall occur one full year following installation of Native Grasses mix, following one full growing season of broadleaf herbicide treatment of the Native Grasses areas, in the spring between April 1, and May 15.~~ (Add. C)

~~4. Native Seed Mix – Two-step installation, Dormant (Winter) Seeding:~~

~~a. Step 1: Installation of the Native Grasses Seed Mix shall occur between November 15, and February 15.~~ (Add. C)

~~1) Perform broadleaf herbicide applications as specified in Part 1.9 to the Native Grasses seeded areas to eliminate broadleaf weeds.~~ (Add. C)

~~b. Do not apply onto snow-covered ground.~~ (Add. C)

~~c. If the site is final graded before the dormant season, following final grading approval, stabilize the site until seeding can occur with the erosion control seed mix listed below:~~ (Add. C)

~~1) May 15 through September 1: Mix of 32 pounds per acre of seed oats (Avena sativa) and 5 pounds per acre of annual rye (Lollium multiflorum).~~ (Add. C)

~~2) September 1 through October 15: 20 pounds per acre winter wheat (Triticum aestivum) or Regreen Sterile Wheat/Wheatgrass Hybrid (Triticum aestivum x Elytrigia elongatafrom).~~ (Add. C)

~~d. Step 2: Installation of the Native Forbs Seed Mix shall occur between November 15, and February 15. Do not apply onto snow-covered ground.~~ (Add. C)

~~5. Native Seed Mix – Two-step installation, Spring and Dormant (Winter) Seeding:~~ (Add. C)

~~a. Step 1: Installation of the Native Grasses Seed Mix shall occur between April 1, through May 15.~~ (Add. C)

~~1) Perform broadleaf herbicide applications as specified in Part 1.9 to the Native Grasses seeded areas to eliminate broadleaf weeds.~~ (Add. C)

~~b. Step 2: Installation of the Native Forbs Seed Mix shall occur between~~

~~**November 15, and February 15. Do not apply onto snow-covered ground.**~~ **(Add. C)**

1.8 WARRANTY (Add. C).

A. Substantial Completion: (Add. C)

1. Following Native Seed Mix installation, the Landscape Architect and Contractor shall conduct a Substantial Completion Inspection on all seeded areas. Following this inspection, re-topsoil, reseed, mulch, and re-apply erosion control blankets as directed by the Landscape Architect. Bare spots greater than 5 square feet shall be reseeded in accordance with the original specifications. All repairs shall be completed within one week following the inspection. All reseeding shall occur at no additional cost to the Owner. (Add. C)

B. Final Acceptance: (Add. C)

1. Final Acceptance will be granted one full year following installation of the Native Seed Mix dependent on achieving specification requirements. Final Acceptance shall be defined as an even distribution and germination of cover crop and an indication of specified native seedlings across the project site. There shall be clear evidence that the specified maintenance mowing has occurred to control weed species. Bare spots greater than 5 square feet shall be reseeded in accordance with the original specifications. All reseeding shall occur at no additional cost to the Owner. Failure to meet the requirement shall result in the Contractor extending the maintenance period until the specified cover is achieved at no additional cost to the Owner. (Add. C)

1.9 MAINTENANCE

A. Native Seed Mix:

1. Site visits shall occur monthly during the first three growing seasons to assess site conditions and correct issues with erosion and weeds. Reports documenting these visits and any completed maintenance shall be submitted to Owner within two weeks following the visit.
2. Seeded areas shall be inspected with the Owner twice annually during each of the first three growing seasons, including a late spring/early summer and an early fall inspection. Notify the Owner of the inspection no less than 2 weeks prior to an inspection. The inspections shall be performed with the Owner in attendance. A report of the findings shall be issued by Contractor including agreed upon maintenance required.
3. First Year Maintenance:
   a. During the first growing season following seeding, mow the native seeded areas each time (up to 4 times) that the plant material (annual and perennial weeds) has reached a height of 12 to 16 inches tall. Mow to a height of 4 to 6 inches. A flail-type mower that will finely shred mowed clippings must be used. Alternatively, a string trimmer may be utilized but all clippings must be removed from the site following cutting.
   b. Do not hand-pull any plants the first year following seeding because such action could disrupt small native seedlings.

c. Spot herbicide application for weed control: Spot treat aggressive weeds with an appropriate herbicide using **a** backpack sprayer with narrow stream nozzle, the wick applicator or soaked-glove method as appropriate for selective treatment of target species. All applications must be made by personnel that are licensed and certified to provide chemical applications and are knowledgeable in identification of native and weed species. All herbicides shall be applied in accordance with manufacturer label directions, including timing, mixing, application, storage, and clean-up.

4. Second Year Maintenance:
   a. During the second growing season, mow once in early June to a height of 12 inches and every time thereafter when the plants reach 24 inches tall. Do not let any annuals or biennials go to seed. A flail-type mower that will finely shred mowed clippings must be used. Alternatively, a string trimmer may be utilized but all clippings must be removed from the site following cutting.
   b. Remove all cut seed heads off-site.
   c. Provide spot herbicide application for weed control as outlined under First Year Maintenance.
5. Third Year Maintenance:
   a. Mow seeded area once in early spring, ~~**when sugar maples are opening their buds,**~~ generally late ~~**April**~~ **March** to early May. Mow to 2 inches and rake off cut material to expose the soil. Burning is an alternate option but is not covered in this Section. **(Add. C)**
   b. Do not mow again during the growing season.
   c. Provide spot herbicide application for weed control as outlined under First Year Maintenance.

~~**B. Native Grasses Seed Mix Maintenance (Duration 2 years: 1st and 2nd years):**~~ **(Add. C)**

~~**1. Mowing:**~~ **(Add. C)**

~~**a. During the first growing season (prior to dormancy) following seeding, mow the native seeded areas each time (up to 4 times) that the plant material (annual and perennial weeds) has reached a height of 12 to 16 inches tall. Mow to a height of 4 to 6 inches. A flail-type mower that will finely shred mowed clippings must be used. Alternatively, a string trimmer may be utilized but all clippings must be removed from the site following cutting.**~~ **(Add. C)**

~~**b. Do not hand-pull any plants the first year following seeding because such action could disrupt small native seedlings.**~~ **(Add. C)**

~~**c. During the second growing season, mow once in early June to a height of 12 inches and every time thereafter when the plants reach 24 inches tall. Do not let any annuals or biennials go to seed. A flail-type mower that will finely shred mowed clippings must be used. Alternatively, a string trimmer may be utilized but all clippings and seed heads must be removed from the site following cutting.**~~ **(Add. C)**

~~**2. Herbicide – Year 1:**~~ **(Add. C)**

a. Following seeding with the Native Grasses Seed Mix, and in conjunction with the maintenance mowing, the Contractor shall apply post-emergent broadleaf herbicide to effectively control broadleaf weeds that appear in the newly seeded areas. (Add. C)
b. Before herbicide is applied, broadleaf weeds shall be clearly identified to determine which herbicide(s) to use that will have the greatest effect at controlling those weeds, and to determine the number of applications that will be necessary to control particular weed species. (Add. C)
c. Timing of post-emergent herbicide applications shall be such that the weeds to be controlled are actively growing so that the most effective control can be achieved. The proper timing recommended on the herbicide manufacturer's label must be strictly followed. However, timing shall also be coordinated with the required maintenance mowing. Follow manufacturer's label to determine the recommended wait period (usually a minimum of at least 7 days) before mowing the native seeded areas to which herbicide has been applied. (Add. C)
d. Herbicides shall be selected that will have no effect on the native grass species into which the herbicide is being applied. (Add. C)
e. The Contractor must follow the manufacturer's herbicide label precisely. No spraying over open water is permitted on any condition. No mixing or preparation of herbicides and no cleanup of equipment shall occur onsite. Upon completion of herbicide application, remove from the site and legally dispose of any remaining herbicide and related chemicals. The Owner accepts no responsibility for actions by the Contractor resulting from misuse of herbicides or failure to correctly follow the manufacturer's label, and all remediation costs shall be the responsibility of the contractor. (Add. C)

C. Native Forbs Seed Mix Maintenance (Duration 1 year: 2nd year only): (Add. C)
1. Following seeding with the Native Forbs Seed Mix, the Contractor shall continue to eradicate weed species using spot herbicide application only. (Add. C)
2. The mowing regimen shall be as outlined above for the Native Grasses Seed Mix. (Add. C)
3. Do not hand-pull any plants the first year following seeding of the Native Forbs Seed Mix because such action could disrupt small native seedlings. (Add. C)
4. Spot herbicide application for weed control: Spot treat aggressive weeds with an appropriate herbicide using a backpack sprayer with narrow stream nozzle, the wick applicator or soaked-glove method as appropriate for selective treatment of target species. All applications must be made by personnel that are licensed and certified to provide chemical applications and are knowledgeable in identification of native and weed species. All herbicides shall be applied in accordance with manufacturer label directions, including timing, mixing, application, storage, and clean-up. (Add. C)

~~D. Third Year Maintenance:~~ (Add. C)

1. ~~Mow seeded area once in early spring when sugar maples are opening their buds, generally late April to early May. Mow to 2 inches and rake off cut material to expose the soil. Burning is an alternate option but is not covered in this Section.~~ (Add. C)
2. ~~Do not mow again during the growing season.~~ (Add. C)
3. ~~Provide spot herbicide application for weed control as outlined under Second Year Maintenance.~~ (Add. C)

PART 2 - PRODUCTS (Add. C)

2.1 MATERIALS (Add. C)

A. Seed: (Add. C)

1. Origin: (Add. C)
   a. All seed material shall originate from local sources to the extent possible, but specifically from project site USDA Plant Hardiness Zone. (Add. C)
2. Quality: (Add. C)
   a. Seed shall be fresh, clean, dry, new-crop seed tested for minimum percentages of purity and germination. (Add. C)
3. Testing Requirements: (Add. C)
   a. The seed weights noted under Part 2.1.A.4 of this section indicate weight per acre in Pure Live Seed (PLS) and shall mean the total amount of fresh new crop seed per acre for all species listed. All test results for purity and vitality shall be completed and submitted in advance of seed installation. Based on these results, the Contractor will be required to provide supplemental seeding for each species that does not meet the specified rates of PLS. (Add. C)
4. Seed Mix Composition: (Add. C)
   a. Native Seed Mix appropriate for project site: Provide the following mix of plant species at the specified individual rate to reach 25 lb/acre for total seed mix: (Add. C)
      1) *Bouteloua gracilis* / Blue Grama: 5.25 lb/acre PLS (Add. C)
      2) *Pascopyrum smithii* / Western Wheatgrass: 5.25 lb/acre PLS (Add. C)
      3) *Achnatherum hymenoides* / Indian Ricegrass: 4.725 lb/acre PLS (Add. C)
      4) *Bouteloua curtipendula* / Sideoats Grama: 1.75 lb/acre PLS (Add. C)
      5) *Sporobolus cryptandrus* / Sand Dropseed: 0.525 lb/acre PLS (Add. C)
      6) *Cleome serrulata* / Rocky Mountain Bee Plant: 1.05 lb/acre PLS (Add. C)
      7) *Dalea candida* / White Prairie Clover: 1.05 lb/acre PLS (Add. C)
      8) *Hedysarum boreale* / Northern Sweetvetch: 1.05 lb/acre PLS (Add. C)
      9) *Penstemon palmeri* / Palmer Beardtongue: 0.9 lb/acre PLS (Add. C)

10) *Gaillardia aristata* / Perennial Blanketflower: 0.9 lb/acre PLS (Add. C)
11) *Penstemon commarhenus* / Dusty Beardtongue: 0.75 lb/acre PLS (Add. C)
12) *Ratibida columnifera pulchra* / Mexican Hat: 0.75 lb/acre PLS (Add. C)
13) *Helianthus annuus* / Annual Sunflower: 0.375 lb/acre PLS (Add. C)
14) *Eriogonum jamesii* / James Wild Buckwheat: 0.1875 lb/acre PLS (Add. C)
15) *Heterotheca villosa* / Silky Golden Aster: 0.1875 lb/acre PLS (Add. C)
16) *Mirabilis multiflora* / Wild Four O'Clock: 0.1875 lb/acre PLS (Add. C)
17) *Penstemon angustifolius* / Pagoda Penstemon: 0.1125 lb/acre PLS (Add. C)

5. Topsoil for seeding shall be on-site and/or pre-approved off-site topsoil. Refer to Section 329100 "Soil Preparation (Topsoil.") (Add. C)

B. Mulch: (Add. C)
1. Straw: (Add. C)
a. Provide stalks from oats, wheat, rye, barley, or rice that are free of weeds, mold, and other objectionable material. (Add. C)
b. Straw shall be in an air-dry condition and suitable for placing with commercial mulch-blowing equipment. (Add. C)

C. Tackifier: (Add. C)
1. Binding agent used to hold straw mulch material in place shall be a clear non-staining latex-based tackifier or a water-soluble polymer. (Add. C)
2. Asphalt emulsion adhesive is not permitted. (Add. C)

D. Mycorrhizal Inoculum: (Add. C)
1. The inoculant shall contain highly selected strains of low host specificity endo- and ectomycorrhizal fungi combined with other beneficial fungi (Trichoderma), humic acids, biostimulants, beneficial bacteria, soluble sea kelp, and yucca plant extracts. Endomycorrhizal fungi shall be available as propagules, i.e., spores, root fragments and hyphae. (Add. C)

E. Erosion Control Blanket: (Add. C)
1. Straw/jute blanket shall be constructed with a 100 percent agricultural straw matrix with jute and cotton netting on top and bottom, be 100 percent biodegradable, and have a typical functional longevity of 12 months. Plastic weaving will not be permitted. (Add. C)
2. Fasteners for erosion control blankets shall be a natural-based plastic product that is 100 percent biodegradable from microbial activity in accordance to ASTM D5338 and ASTM D5271, formed in a T-shape with barbed head and shoulders, 6 inches long, and installed per manufacturer's instructions. (Add. C)

F. Jute Mesh/Jute Netting: (Add. C)

1. Uniform, open, plain weave fabric of unbleached, single jute yarn having a width of 48 inches, plus or minus 1 inch and durability of 1-2 years. Yarn shall be loosely twisted jute fiber, having an average twist of not less than 1.6 turns per inch, varying in thickness by not more than 1/2 its normal diameter, and averaging 130 pounds per spindle of 14,400 yards. Polymer yarns are not acceptable. (Add. C)
2. Fasteners shall be natural-based plastic that is 100% biodegradable from microbial activity in accordance with ASTM D5338 or D6400, formed in a T-shaped with barbed heads and shoulders, minimum six inches long, color green and installed per manufacturer's spacing and installation instructions. (Add. C)

G. Water: (Add. C)
1. Water shall be free of hazardous chemicals detrimental to seed establishment. Contractor to verify water source; confirm prior to commencing work. (Add. C)

2.2 EQUIPMENT (Add. C)

A. A spinning-disc type broadcaster with a calibration gauge shall be used to broadcast the seed over the designated areas. (Add. C)

B. Drill seeder, such as Truax or Tye drill, or John Deere Rangeland drill. (Add. C)

C. Drop seeder/spreader with cultipacker, such as Brillion or John Deere. (Add. C)

D. Hydraulic Seeder. (Add. C)

E. Crimping Device: (Add. C)
1. A mulch disc or other mechanical anchoring/crimping device for use in anchoring straw mulch into place, such as a Reinco Model MD-96 or equivalent, with flat discs with notched edges spaced 8 inches apart to impress mulch 1 to 3 inches down into soil. (Add. C)
2. Crimping device (serrated disk) is an acceptable alternative to the Tackifier and is the preferred method of anchoring. (Add. C)

PART 3 - EXECUTION

3.1 EXAMINATION (Add. C)

A. Upon authorization to proceed with the work, the Contractor shall examine and verify the acceptability of the job site. Notify the Landscape Architect if conditions detrimental to plant growth are encountered such as rubble fill, adverse drainage conditions, or other obstructions that are not shown on the Plans. Do not proceed with the work until unsatisfactory conditions have been corrected or resolved in writing by the Landscape Architect. (Add. C)

B. Coordination is required to ensure rainfall/groundwater seepage does not result in soil moisture conditions that will cause excessive rutting during seeding and mulching operations. Failure to meet this requirement will not be an acceptable reason for not installing the seed as specified. (Add. C)

C. Where seeding occurs in close proximity to other site improvements or areas to remain undisturbed such as existing wetlands and uplands areas, care shall be taken to not disturb the existing conditions. Any areas damaged during planting operations shall be promptly restored to their original condition at no cost to the Owner. (Add. C)

3.2 PREPARATION (Add. C)

A. Immediately following contract award, the Contractor shall begin seed procurement. During the four week procurement period, the Contractor shall locate all seed suppliers, collectors and producers and set up supply contracts to ensure that the quantity and quality of seed material will be available during the specified planting window. (Add. C)

B. Any species substitutions MUST be approved by the Landscape Architect prior to seed procurement. (Add. C)

3.3 INSTALLATION

A. General:
1. Do not sow seed during adverse weather or when wind speeds exceed five miles per hour.
2. Do not sow seed in areas where standing water is present.

B. Grade Preparation:
1. Subgrade and finish grade preparation shall be in accordance with site earthwork requirements, and topsoil shall be a minimum 12 inches deep on cut slopes and a minimum 4 inches deep on fill slopes after light compaction to prevent settlement.
2. Prior to seeding, repair any ruts, rills, or gullies greater than 2 inches in depth to create smooth continuous grades for upland areas.
3. If the prepared grade is eroded or compacted by rainfall or other reasons, rework the topsoil to the full depth.
4. Immediately before seeding, scarify, loosen, float and drag topsoil minimum 12 inch depth as necessary to bring it to the proper condition. Remove foreign matter larger than 1-inch diameter.
5. No further grade preparation is required.

C. Layout:
1. All seeding zone boundaries shall be surveyed and staked on the project site by the Contractor. No seed mix shall be installed until the grade preparation and layout have been approved by the Landscape Architect.
2. The Landscape Architect reserves the right to adjust seed limits without adjusting total seeded areas, to meet field conditions, at no additional cost to the Owner.

D. Method:
1. Hand-broadcasting:
   a. For dormant seeding, the plant material from the previous growing season shall be cut to a maximum 6-inch height and cut material removed to allow the broadcast seed to make good soil contact. Seed can be sown directly into the cut plant stubble.

b. For spring seeding, sow seed directly onto bare ground or ground where the previous year's plant stubble has been cut to 2-inch height and cut material removed.
c. Increase the volume of the broadcasted seed mix by mixing it with an approved carrier. Acceptable carrier material includes moistened compost, peat moss, corn cob blast media, or coarse-grade vermiculite. Sand and sawdust are unacceptable carrier materials. Use one bushel basket of carrier per 1,000 square feet of area to be seeded (a bushel equals 8 gallons or 1.24 cubic feet).
d. Use half of the total seed quantity and cross the entire area to be seeded, evenly spreading the seed. Walk perpendicular to the original seeding and evenly broadcast the second half of the seed.
e. Light seeds, awned seeds, or bearded seeds tend to rise to the top of the spreader, therefore, mix seed accordingly as planting commences.
f. For upland areas, rake or drag the seed into the soil, but not more than 1/4-inch deep. Roll the area with a roller to firm the seed into the soil. For wetland areas, seed must be left on the soil surface but should be rolled to increase soil contact if soil conditions allow. Rolling is not necessary on dormant seedings.

2. Drill Seeder or Drop Seeder/Spreader:
   a. For dormant drill seeding, the plant material from the previous growing season should be cut to a maximum 6 inch height and cut material removed to allow the seed to make good soil contact. Seed can be sown directly into the cut plant stubble.
   b. For dormant drop seeding, the previous year's plant material should be cut and the ground cultivated before installing seed mix.
   c. For spring drill seeding, sow seed directly onto bare ground or ground where the previous year's plant stubble has been cut to 2 inch height and cut material removed; for spring drop seeding, cultivate the ground before installing seed mix.
   d. Check the equipment frequently to ensure the seed is dispersing evenly and is not clogging.
   e. If the equipment is not equipped with a roller, pass over the seeded area with a roller to firm the seed into the soil. Rolling is not necessary with dormant seeding.
   f. Do not mix the native seed with any carrier material.
   g. Evenly distribute the seed across the entire site to be seeded.

3. Hydraulic Seeder: (Add. C)
   a. Materials Inspection: (Add. C)
      1) The day of hydroseeding, Contractor shall provide hydroseed machine, water, labor, unopened fertilizer, tackifier and unopened seed mix in original manufacturer's container, and fiber material. (Add. C)
      2) The Owner shall inspect and observe the water, mulch, seed mix, fertilizer and tackifier in the original containers prior to pouring into tank and application. (Add. C)

3) Any materials placed in the tank, including water, without observation will be rejected and replaced at no additional cost to the Owner. (Add. C)

b. Mixing: (Add. C)

1) Care shall be taken that the slurry preparation takes place on the site of the work. Any mixture prepared or applied prior to the owner observation or prior to being on site will not be accepted. Spraying shall commence immediately after inspection when the tank is full. (Add. C)

2) Operators of hydroseeding equipment shall be thoroughly experienced in this type of application. Apply specified slurry mix in a motion to form a unified mat at specified rate, making minimum two passes at perpendicular directions to ensure total coverage. The operator shall spray the area with a uniform, visible coat. Keep hydroseed within areas designated and keep from contact with other plant material. Slurry mixture which has not been applied within 4 hours of mixing shall not be used and shall be removed from site. (Add. C)

3) After installation, the Contractor shall not operate any equipment over the covered area. Immediately after application, thoroughly wash off any plant material, planting areas, or paved areas not intended to receive slurry mix. Keep all paved and planting areas clean during maintenance operations. (Add. C)

4. Contractor shall determine which erosion control measures are appropriate for each seeded area by considering factors such as slope and designed water flow through the area. (Add. C)

5. Keep the topsoil moist (to a depth of 3 inches) for 3-6 weeks following seeding; afterward, apply one inch of water during the growing season if rain has not occurred for more than one week. Do not apply water with such a force as to disturb seed, seedlings, and/or topsoil, or that would run off soil surface.

E. Straw Mulch: (Add. C)

1. Spread straw mulch evenly at the rate of 2 tons per acre over the native seeded areas. Place all mulch on given areas within 48 hours after seeding. A mechanical blower may be used to apply mulch material, provided the machine has been specifically designed and approved for this purpose. Anchor all mulch with crimping (preferred) or tackifier. If a spray tackifier is used, it may be applied either simultaneously with mulch or in a separate application. Apply tackifier over all mulched areas at a rate recommended by manufacturer. (Add. C)

F. Erosion Control Blanket: (Add. C)

1. Seed must be installed prior to erosion control blanket. (Add. C)
2. Install erosion control blanket as indicated in details on the Plans on all areas specified to receive it. (Add. C)

3. **Immediately following seeding, erosion control blanket shall be rolled out in place in the direction of the slope fall line. The material shall be applied without stretching and shall lie smoothly but loosely on the soil surface. Installers shall minimize walking directly on the seed or topsoil bed either before or after the blanket is applied. (Add. C)**
4. **All ends shall be buried a minimum of 4 inches deep and the trench shall be firmly tamped after closing. (Add. C)**
5. **In cases where roll ends join, the up-slope piece shall overlap the down-slope piece by at least 18 inches. (Add. C)**
6. **Staple edges prior to backfilling trench, all overlaps at 12-inch intervals, and the center of each panel on 3-foot intervals. (Add. C)**
7. **The upslope ends of the blanket shall be buried a minimum of 6 inches deep and stapled at 12-inch intervals prior to backfilling trench. (Add. C)**
8. **Reseed all disturbed edges immediately following straw blanket installation and work seed into blanket. (Add. C)**

3.4 REPAIR/RESTORATION

A. All areas over which hauling operations have been conducted shall be kept clean on a daily basis. Promptly remove all materials spilled on pavement.

B. Upon completion of seed installation, remove from the site and legally dispose of all trash and debris including any material removed during grade preparation.

C. Restore any existing areas damaged by operations under the contract. Restoration shall include finish grading and seeding as required to match existing grade and/or wetlands, and maintenance of restored areas.

D. Protect seeded areas from stormwater flows discharging from paved surfaces until vegetation establishment. Additional water diversion and erosion control measures including but not limited to silt fence, sediment control tubes, wattles, and check dams may be utilized at Contractor's discretion and expense. Remove non-biodegradable erosion control measures after vegetation establishment.

E. Any damage by the Contractor to established or newly seeded areas not within the project scope of work shall be repaired and reseeded at no cost to the Owner.

END OF SECTION