

July 6, 2026

Addendum No. 2

Salina Intermediate School - Recreational Field

Dearborn Public Schools

Dearborn, MI 48120

A/E # 2014.21A

ADDENDUM NO. 2

SPECIAL NOTE:

The Notice to Bidders, Instructions to Bidders, General Conditions of the Contract for Construction, Supplementary Conditions of the Contract for Construction, and all modifications and previously issued Contract Documentation are a part of this Addendum.

SCOPE OF WORK:

The following items are changes, additions, deletions, clarifications and/or errors and omissions in plans and specifications, and shall be considered by each Bidder in making up and submitting their proposal. All of these items shall be considered a part of the Contract Documents.

NOTICE TO ALL BIDDERS:

All Bidders shall take note of all items covered by this Addendum. Each Bidder shall review the total scope of their responsibilities with respect to their contract work and interface with the work of others, as well as their required interface with their work.

ATTACHMENTS:

000110 – Table of Contents

011000 – Summary

012100 – Allowances

012200 – Unit Prices

PORTAGE
950 Trade Centre Way, Suite 130
Portage, MI 49002
T: 800.632.7815

GRAND RAPIDS
801 Broadway NW, Suite 306
Grand Rapids, MI 49504
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CHELSEA
300 N. Main Street, Suite 204
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T: 800.632.7815

ROYAL OAK
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Royal Oak, MI 48067
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012500 – Substitution Procedures

015639 – Temporary Tree and Plant Protection

015723 – Temporary Storm Water Pollution

024119 – Selective Demolition

311000 – Site Clearing

312000 – Earth Moving

321124 – Aggregate Base Course

321216 – Asphalt Paving

321313 – Concrete Paving

329119 – Topsoil For Landscaping & Construction

329200 – Natural Turf & Sodding

329410 – Engineered Wood Fiber

SPECIFICATIONS:

- Item No. 1. Edited Spec 00110 – Table of Contents.
- Item No. 2. Added Spec 011000 - Summary.
- Item No. 3. Added Spec. 012100 – Allowances.
- Item No. 4. Added Spec. 012200 – Unit Prices
- Item No. 5. Added Spec. 012500 – Substitution Procedures
- Item No. 6. Added Spec. 015639 – Temporary Tree and Plant Protection
- Item No. 7. Added Spec. 015723 – Temporary Storm Water Pollution
- Item No. 8. Added Spec. 024119 – Selective Demolition
- Item No. 9. Added Spec. 311000 – Site Clearing
- Item No. 10. Added Spec. 312000 – Earth Moving

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- Item No. 11. Added Spec. 321124 – Aggregate Base Course
- Item No. 12. Added Spec. 321216 – Asphalt Paving
- Item No. 13. Added Spec. 321313 – Concrete Paving
- Item No. 14. Added Spec. 329119 – Topsoil For Landscaping & Construction
- Item No. 15. Added Spec. 329200 – Natural Turf & Sodding
- Item No. 16. Added Spec. 329410 – Engineered Wood Fiber

DRAWINGS:

N/A

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SECTION 000110 - TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

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012300 - Alternates

012500 - Substitution Procedures

013000 - Administrative Requirements

013300 - Submittal Procedures

014000 - Quality Requirements

014216 - Definitions

014533 - Code-Required Special Inspections

015000 - Temporary Facilities and Controls

015639 - Temporary Tree and Plant Protection

015713 - Temporary Erosion and Sediment Control

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SECTION 011000 - SUMMARY

PART 1 GENERAL

1.1 PROJECT

- A. Project Name: Dearborn - Salina Intermediate School Recreation Field
- B. Owner's Name: Dearborn Public Schools
- C. Architect's Name: Kingscott Associates, Inc..
- D. The Project consists of the construction of a new recreational field.

1.2 CONTRACT DESCRIPTION

1.3 DESCRIPTION OF ALTERATIONS WORK

- A. Scope of demolition and removal work is indicated on drawings and specified in Section 024100.
- B. Scope of alterations work is indicated on drawings.
- C. Owner will remove the following items before start of work:
 - 1. Gardening or temporary outdoor classroom furnishings, such as tools, shovels, classroom tools, etc.
- D. Contractor is required to remove and deliver the following to Owner prior to start of work:
 - 1. N/A.
- E. Contractor is required to remove and store the following prior to start of work, for later reinstallation by Contractor:
 - 1. N/A.

1.4 WORK BY OWNER

1.5 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
- B. Owner intends to occupy the Project upon Substantial Completion.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

1.6 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

1. Locate and conduct construction activities in ways that will limit disturbance to site.

B. Provide access to and from site as required by law and by Owner:

1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
2. Do not obstruct roadways, sidewalks, or other public ways without permit.

C. Existing building spaces may not be used for storage.

D. Utility Outages and Shutdown:

1. Limit disruption of utility services to hours the building is unoccupied.
2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
3. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012100 - ALLOWANCES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Contingency allowance.
- B. Inspecting and testing allowances.

1.2 CONTINGENCY ALLOWANCE

- A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
- B. Funds will be drawn from the Contingency Allowance only by Change Order.
- C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.3 INSPECTING AND TESTING ALLOWANCES

- A. Costs Included in Inspecting and Testing Allowances: Cost of engaging an inspecting or testing agency; execution of inspecting and tests; and reporting results.
- B. Costs Not Included in the Inspecting and Testing Allowances:
 - 1. Costs of incidental labor and facilities required to assist inspecting or testing agency.
 - 2. Costs of testing services used by Contractor separate from Contract Document requirements.
 - 3. Costs of retesting upon failure of previous tests as determined by Architect.
- C. Payment Procedures:
 - 1. Submit one copy of the inspecting or testing firm's invoice with next application for payment.
 - 2. Pay invoice on approval by Architect.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 012200 - UNIT PRICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Section includes administrative and procedural requirements for unit prices.

1.2 RELATED REQUIREMENTS

- A. Section 012100 "Allowances" for procedures for using unit prices to adjust quantity allowances.
- B. Section 014000 "Quality Requirements" for field testing by an independent testing agency.

1.3 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.4 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.5 DEFINITIONS

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.6 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the Part 3 "Schedule of Unit Prices" Article contain requirements for materials described under each unit price.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price No. 1: Removal of unsatisfactory soil and replacement with satisfactory soil material.
 - 1. Description: Unsatisfactory soil excavation and disposal off-site and replacement with satisfactory fill material or engineered fill from off-site, as required, in accordance with Section 312000 "Earth Moving."
 - 2. Unit of Measurement: of soil excavated, based on in-place surveys of volume before and after removal.
 - a. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."
- B. Unit Price No. 4: Cutting and patching of concrete slabs-on-grade.
 - 1. Description: Cutting of new or existing concrete slabs-on-grade up to 6 inches (152.4 mm) thick, removal and excavation as required, and subsequent backfill, compaction, and patching of concrete in accordance with Section 017300 "Execution." not otherwise indicated in the Contract Documents.
 - 2. Unit of Measurement: of concrete removed.

END OF SECTION

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.2 RELATED REQUIREMENTS

- A. Section 012300 - Alternates, for product alternatives affecting this section.

1.3 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.4 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, equipment, and methods of construction.
 - 1. Substitutions for Cause: Proposed by Contractor due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 - c. Unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements due to possibility of offering substantial advantage to the Project.
 - a. Substitution requests offering advantages solely to the Contractor will not be considered.

1.5 ACTION SUBMITTALS

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form:
 - a. Prior and During Bidding Phase: CSI 1.5C
 - b. After Bidding and/or During Contract Negotiation: CSI 13.1A

2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Certificates and qualification data, where applicable or requested.
 - f. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - h. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - i. Cost information, including a proposal of change, if any, in the Contract Sum.
 - j. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - k. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary for post-bid requests, Architect will request additional information or documentation for evaluation within 14 days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of

acceptance or rejection of proposed substitution within 14 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.6 REFERENCE STANDARDS

- A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.
- B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

1.7 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.8 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.9 SUBSTITUTIONS

- A. Substitutions for Cause, significant savings or construction schedule: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution is compatible with other portions of the Work.
 2. Requested substitution has been coordinated with other portions of the Work.
 - a. Requested substitution provides specified warranty.

- b. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. A Substitution Request for specified installer constitutes a representation that the submitter:
 - 1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
 - 2. Include statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - 3. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

- D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
- E. Limit each request to a single proposed substitution item.
 - 1. Submit an electronic document, combining the request form with supporting data into single document.

3.2 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Submittal Time Restrictions:
 - 1. Owner will consider requests for substitutions only if submitted at least 10 days prior to the date for receipt of bids.
- B. Submittal Form (before award of contract):
 - 1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.3 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):
 - 1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request (After Bidding/Negotiating). See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- C. Substitutions will not be considered under one or more of the following circumstances:
 - 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 2. Without a separate written request.
 - 3. When acceptance will require revisions to Contract Documents.

3.4 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.

3.5 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.6 CLOSEOUT ACTIVITIES

- A. See Section 017800 - Closeout Submittals, for closeout submittals.
- B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

3.7 ATTACHMENTS

- A. A facsimile of the Substitution Request Form (During Construction) required to be used on the Project is included after this section.

END OF SECTION

SECTION 015639 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.1 SUMMARY

- A. The Work of this Section Includes: General protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.
- B. Related Requirements:
 - 1. Section 015000 "Temporary Facilities and Controls" for temporary controls, utilities, support facilities, temporary site fencing, and, if applicable, temporary erosion and sedimentation controls if not specified in Section 311000 "Site Clearing".
 - 2. Section 311000 "Site Clearing" for removing existing trees and shrubs and for temporary erosion- and sedimentation-control measures if not specified in Section 015000 "Temporary Facilities and Controls".
 - 3. Section 329600 "Transplanting" for relocating existing trees and plants.

1.2 DEFINITIONS

- A. Caliper: Diameter of a trunk measured by a diameter tape or the average of the smallest and largest diameters at a height 6 inches (152.4 mm) above the ground for trees up to and including 4-inch (100-mm) size at this height and as measured at a height of 12 inches (304.8 mm) above the ground for trees larger than 4-inch (100-mm) size.
- B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by a circle concentric with each tree with a radius 12 times the tree's caliper size and with a minimum radius of 96 inches (2438.4 mm) unless otherwise indicated.
- D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.3 PREINSTALLATION MEETINGS

- 1. Preinstallation Conference: Conduct conference at project site.
- 2. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:
 - a. Tree-service firm's personnel and equipment needed to make progress and avoid delays.

- b. Arborist's responsibilities.
- c. Quality-control program.
- d. Coordination of Work and equipment movement with the locations of protection zones.
- e. Trenching by hand or with air spade within protection zones.
- f. Field quality control.

1.4 ACTION SUBMITTALS

A. Product Data:

- 1. General protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction

B. Shop Drawings:

- 1. Include plans, elevations, and sections showing trees and plants to be protected, locations of protection-zone fencing and signage, and the relationship between equipment-movement routes and material storage locations with protection zones.
- 2. Detail fabrication and assembly of protection-zone fencing and signage.
- 3. Indicate extent of utility boring and trenching by hand or with air spade within protection zones.

C. Samples: For each type of the following:

- 1. Organic Mulch: 1-quart (1-L) volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
- 2. Protection-Zone Fencing: Assembled Samples of manufacturer's standard size made from full-size components.
- 3. Protection-Zone Signage: Full-size Samples of each size and text, ready for installation.

D. Tree-Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

- 1. Species and size of tree.
- 2. Location on site plan. Include unique identifier for each.
- 3. Reason for pruning.
- 4. Description of pruning to be performed.
- 5. Description of maintenance following pruning.

- E. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- F. Mitigation Requirements: As required by jurisdiction or as developed by arborist, for mitigation of damage to trees and other plantings. Include the following:
 - 1. Local ordinances governing tree mitigation.
 - 2. Standards established under the approved tree mitigation report developed by the arborist.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Statements: For arborist and tree service firm.
- B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction in accordance with recognized standards and that trees were promptly and properly treated and repaired when damaged.
- C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
 - 1. Use sufficiently detailed photographs or video recordings.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- E. Quality-control program.

1.6 QUALITY ASSURANCE

- A. Arborist Qualifications: Certified Arborist as certified by ISA.
- B. Tree-Service Firm Qualifications: An experienced tree-service firm that has successfully completed temporary tree- and plant-protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.
- C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection-zone fencing and signage, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.7 FIELD CONDITIONS

- A. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Moving or parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.
- D. Take precautions to protect plants from airborne contaminants, such as paint or fireproofing overspray.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Backfill Soil: Stockpiled soil mixed with planting soil or new planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
 - 1. Mixture: Well-blended mix of 2 parts stockpiled soil to 1 part planting soil.
 - 2. Planting Soil: Planting soil as specified in Section 329113 "Soil Preparation," Section 329115 "Soil Preparation (Performance Specification)," Section 329119 "Topsoil."
- B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:
 - 1. Type: Shredded hardwood, Ground or shredded bark, or Wood and bark chips.
 - 2. Size Range: 3 inches (76.2 mm) maximum, 1/2 inch (12.7 mm) minimum.
 - 3. Color: Natural.

- C. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements: Previously used materials may be used when approved by Architect.
1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch (50-mm) maximum opening in pattern and weighing a minimum of 0.4 lb/ft. (0.6 kg/m); remaining flexible from minus 60 to plus 200 deg F (minus 16 to plus 93 deg C); inert to most chemicals and acids; minimum tensile yield strength of 2000 psi (13789.52 kPa) and ultimate tensile strength of 2680 psi (18477.96 kPa); secured with plastic bands or galvanized-steel or stainless steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches (2438.4 mm) apart.
 - a. Height: 48 inches (1219.2 mm).
 - b. Color: High-visibility orange, nonfading.
 2. Gates: Single or double swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones; leaf width 24 inches (609.6 mm) or 36 inches (914.4 mm).
- D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering and as follows:
1. Size and Text: min 10" x 10" in size
 2. Lettering: 3-inch- (76-mm-) high minimum, black characters on white background.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

- A. Locate and clearly identify trees, shrubs, and other vegetation to remain and/or be relocated. Identify with a blue vinyl tape flag or tie [1] inch (25-mm) wrapped around each tree trunk or visible branch end at [54] inches (1372-mm) above ground.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

3.3 TREE PROTECTION

- A. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.
 - 1. Apply 2-inch (50-mm) uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches (152.4 mm) of tree trunks.
- B. Trunk Protection: Protect the trunk of each tree to remain as follows:
 - 1. Wrap trunk with orange plastic construction fencing to 2 inches (50.8 mm) in thickness minimum 1/4-inch (6-mm) closed-cell foam pads. Install 2-by-4-inch (50-by-100-mm) or 2-by-6-inch (50-by-150-mm) wood planks around trunk over wrap at maximum 3 inches (76.2 mm) apart. Minimum three planks per tree. Band together with no less than three steel bands stapled to the planks to hold them securely in place.
 - a. Height: 48 inches (1219.2 mm) from lowest branch.
 - b. Trunk protection to remain in place no longer than 12 months. If construction exceeds timeframe indicated, inspect trunk protection at 6 month intervals and loosen if necessary.

3.4 PROTECTION ZONES

- A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.
 - 1. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.
 - 2. Access Gates: Install and adjust to operate smoothly, easily, and quietly; free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
 - 3. Plastic Fencing: Stretch fabric taut and secure to posts without bows or sags.
- B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect. Install one sign spaced approximately every 20 feet (609.6 cm) on protection-zone fencing, but no fewer than four signs with each facing a different direction.
- C. Maintain protection zones free of weeds and trash.

- D. Maintain hydration of plants to assure plant survival.
- E. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.
 - 1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
 - 2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.5 EXCAVATION

- A. General: Excavate at edge of protection zones and for trenches indicated within protection zones in accordance with requirements in Section 31200 "Earth Moving" unless otherwise indicated.
- B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots [2] inches (50.8-mm) or larger; cut only smaller roots that interfere with installations of utilities. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.

3.6 ROOT PRUNING

- A. Only if tree root pruning is necessary, prune tree roots that are affected by temporary and permanent construction. Prune roots as indicated on Drawings and as follows:
 - 1. Pruning roots [2] inches (50.8-mm) or larger is to be performed under the supervision of an ISA certified Arborist.
 - 2. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
 - 3.
 - 4. Temporarily support and protect roots from damage until they are permanently covered with soil.
 - 5. Cover exposed roots with burlap and water regularly.
 - 6. Backfill as soon as possible in accordance with requirements in Section 31200 "Earth Moving."
- B. Root Pruning at Edge of Protection Zone: Prune tree roots [12] inches (300-mm) outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.

- C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.7 CROWN PRUNING

- A. Prune branches that are affected by temporary and permanent construction. Prune branches as indicated on Drawings, under direction of arborist or as directed by arborist.
 - 1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
 - 2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
 - 3. Pruning Standards: Prune trees in accordance with ANSI A300 (Part 1) and as indicated on Drawings.
 - a. Type of Pruning: cleaning, raising, reducing, or thinning where indicated.
- B. Unless otherwise directed by arborist and acceptable to Architect, do not cut tree leaders.
- C. Cut branches with sharp pruning instruments; do not break or chop.
- D. Do not paint or apply sealants to wounds.
- E. Provide subsequent maintenance pruning during Contract period as recommended by arborist.

3.8 REGRADING

- A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain grades within the protection zone.
- B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.
 - 1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.
- C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- D. Minor Fill within Protection Zone: Where existing grade is [2] inches (50.8-mm) or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.9 FIELD QUALITY CONTROL

- A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.10 REPAIR AND REPLACEMENT

- A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect.
 - 1. Submit details of proposed pruning and repairs.
 - 2. Perform repairs of damaged trunks, branches, and roots within 24 hours in accordance with arborist's written instructions.
 - 3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.
- B. Trees: Remove and replace trees indicated to remain that are more than 66 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.
 - 1. Small Trees: Provide new trees of same size and species as those being replaced for each tree that measures 4-inch (100-mm) or smaller in caliper size.
 - 2. Large Trees: Provide two new tree(s) of 4-inch (100-mm) caliper size for each tree being replaced that measures more than 6 inches (152.4 mm) in caliper size.
 - a. Species: As selected by Architect.
 - 3. Plant and maintain new trees as specified in Section 329300 "Plants."
- C. Soil Aeration: Where directed by Architect, aerate surface soil compacted during construction. Aerate [10] feet (3-m) beyond drip line and no closer than [36] inches (900-mm) to tree trunk. Drill [2] inch (50.8-mm) diameter holes a minimum of [12] inches (300-mm) deep at [24] inches (600-mm) o.c. Backfill holes with an equal mix of augered soil and sand.

END OF SECTION

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SECTION 015723 - TEMPORARY STORM WATER POLLUTION

SECTION 015723 - TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 GENERAL

2.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

2.2 SUMMARY

- A. Section Includes:

- 1. Temporary stormwater pollution controls.

2.3 STORMWATER POLLUTION PREVENTION PLAN

- A. The Stormwater Pollution Prevention Plan (SWPPP) is part of the Contract Documents and is bound into this Project Manual.

2.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project Site.

- 1. Meet with Owner, Architect, Construction Manager, and earthwork subcontractor.
 - 2. Review requirements of the SWPPP, including permitting process, worker training, and inspection and maintenance requirements.

2.5 INFORMATIONAL SUBMITTALS

- A. Stormwater Pollution Prevention Plan (SWPP): Within 15 days of date established for commencement of the Work, submit completed SWPPP.
- B. EPA authorization under the EPA's "2017 Construction General Permit (CGP)."
- C. Stormwater Pollution Prevention (SWPP) Training Log: For each individual performing Work under the SWPPP.
- D. Inspection reports.

2.6 QUALITY ASSURANCE

- A. Stormwater Pollution Prevention Plan (SWPPP) Coordinator: Experienced individual or firm with a record of successful water pollution control management coordination of projects with similar requirements.

1. SWPPP Coordinator shall complete and finalize the SWPPP form.
2. SWPPP Coordinator shall be responsible for inspections and maintaining of all requirements of the SWPPP.

B. Installers: Trained as indicated in the SWPPP.

PART 2 PRODUCTS

3.1 TEMPORARY STORMWATER POLLUTION CONTROLS

A. Provide temporary stormwater pollution controls as required by the SWPPP.

PART 3 EXECUTION

4.1 INSTALLATION

- A. Comply with all best management practices, general requirements, performance requirements, reporting requirements, and all other requirements included in the SWPPP.
- B. Locate stormwater pollution controls in accordance with the SWPPP.
- C. Conduct construction as required to comply with the SWPPP and that minimize possible contamination or pollution or other undesirable effects.
 1. Inspect, repair, and maintain SWPPP controls during construction.
 - a. Inspect all SWPPP controls not less than every seven days, and after each occurrence of a storm event, as outlined in the SWPPP.
- D. Remove SWPPP controls at completion of construction and restore and stabilize areas disturbed during construction.

END OF SECTION

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
3. Section 017300 "Execution" for cutting and patching procedures.
4. Section 013516 "Alteration Project Procedures" for general protection and work procedures for alteration projects.
5. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.
6. Section 330500 "Common Work Results for Utilities" for removal of site utility systems piping, equipment, and components.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.
 - 6. Review and finalize protection requirements.
 - 7. Review procedures for noise control and dust control.
 - 8. Review storage, protection, and accounting for items to be removed for salvage or reinstallation.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 QUALITY ASSURANCE

1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove the following items:
 - a. ADD LIST OF ITEMS IF APPLICABLE .
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
 - 3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video .
 - 1. Inventory and record the condition of items to be removed and salvaged.
 - 2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

- e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain fire watch during and for at least 2 hours after flame-cutting operations.
 6. Maintain adequate ventilation when using cutting torches.
 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 10. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectional conditions, such as ice, flooding, and pollution.
- C. Work in Historic Areas: Selective demolition may be performed only in areas of Project that are not designated as historic. In historic spaces, areas, and rooms, or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Section 024296 "Historic Removal and Dismantling."
- D. Removed and Salvaged Items:

1. Transport items to Owner's storage area designated by Owner .
 2. Protect items from damage during transport and storage.
- E. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19.05 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section ??? for new roofing requirements.
 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 2. Remove existing roofing system down to substrate.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site.
 1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 311000 - SITE CLEARING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and removing site utilities.
7. Temporary erosion- and sedimentation-control measures.

B. Related Sections:

1. Section 015000 "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities, and temporary erosion- and sedimentation-control measures.
2. Section 017300 "Execution" for field engineering and surveying.
3. Section 017419 "Construction Waste Management and Disposal."

1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably

free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50.8 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.
- F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or videotape.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises.
- C. Utility Locator Service: Notify Miss Dig for area where Project is located before site clearing.

- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.
- E. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- F. Do not direct vehicle or equipment exhaust towards protection zones.
- G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- H. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Flag each tree trunk at 54 inches (1371.6 mm) above the ground.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction. Contractor shall acquire the local soil erosion permit.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. General: Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.4 EXISTING UTILITIES

- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Owner will arrange to shut off indicated utilities when requested by Contractor.
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.
- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify CM not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.
- E. Excavate for and remove underground utilities indicated to be removed.

- F. Removal of underground utilities is included in earthwork sections and with applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security and utilities sections and Section 024116 "Structure Demolition" and Section 024119 "Selective Structure Demolition."

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches (457.2 mm) below exposed subgrade.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (203.2 mm), and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 6 inches (152.4 mm) in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches (50.8 mm) in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72 inches (1828.8 mm).
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
 - 4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION

SECTION 312000 - EARTH MOVING

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)); 2012 (Reapproved 2021).
- B. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).
- C. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.
- D. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. This Section includes the following:
 - 1. Preparing subgrades for walks, pavements, lawns and grasses.
 - 2. Subbase course for concrete walks and/or pavements.
 - 3. Subbase and base course for asphalt paving.
 - 4. Excavating and backfilling for utility trenches.
- B. Related Sections include the following:
 - 1. Division 31 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
 - 2. Division 32 Section "Turf and Grasses" for finish grading, including preparing and placing topsoil and planting soil for lawns.

1.4 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.
- C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Construction Manager. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
 2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Construction Manager. Unauthorized excavation, as well as remedial work directed by Construction Manager, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- I. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- 1.5 SUBMITTALS
- A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D2487 of each on-site and borrow soil material proposed for fill and backfill.

2. Laboratory compaction curve according to ASTM D1557 for each on-site and borrow soil material proposed for fill and backfill.
3. Percolation tests for subgrade and planting soil as described on the Drawings.

1.6 QUALITY ASSURANCE

- A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and rock-definition testing, as documented according to ASTM D3740 and ASTM E 548.
- B. Preexcavation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Construction Manager and then only after arranging to provide temporary utility services according to requirements indicated.
 1. Notify Construction Manager not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Construction Manager's written permission.
 3. Contact utility-locator service for area where Project is located before excavating.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.
 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: MDOT Class II sand.

- E. Base Course for Pavements: See Construction Plans.
- F. Base for Artificial Turf: Refer to other Division 31 sections.
- G. Engineered Fill: MDOT Class II sand.
- H. Bedding Course: MDOT Class II sand.
- I. Sand: MDOT Class II sand.

2.2 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils 0 inch (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
 - 1. Red: Electric.
 - 2. Yellow: Gas, oil, steam, and dangerous materials.
 - 3. Orange: Telephone and other communications.
 - 4. Blue: Water systems.
 - 5. Green: Sewer systems.

PART 3 EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 31 Section "Site Clearing."
- C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing," during earthwork operations.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
 1. Clearance: 12 inches (300 mm) each side of pipe or conduit.
- C. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.
 1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.7 SUBGRADE INSPECTION

- A. Notify Construction Manager when excavations have reached required subgrade.
- B. If Construction Manager determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below pavements and artificial turf with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
 2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Construction Manager, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Construction Manager, without additional compensation.
- 3.8 UNAUTHORIZED EXCAVATION
- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Construction Manager.
1. Fill unauthorized excavations under other construction or utility pipe as directed by Construction Manager.
- 3.9 STORAGE OF SOIL MATERIALS
- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
- 3.10 BACKFILL
- A. Place and compact backfill in excavations promptly, but not before completing the following:
1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 2. Surveying locations of underground utilities for Record Documents.
 3. Testing and inspecting underground utilities.
 4. Removing concrete formwork.
 5. Removing trash and debris.
 6. Removing temporary shoring and bracing, and sheeting.

7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.11 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings.

D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the utility pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Backfill voids with satisfactory soil while installing and removing shoring and bracing.

F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

G. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.12 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.

2. Under walks, pavements, and artificial turf, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.13 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D1557:
 1. Under pavements and artificial turf, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
 3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
 4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
 2. Walks: Plus or minus 1 inch (25 mm).
 3. Running track: Tolerances as per governing authority requirements.

3.16 SUBBASE AND BASE COURSES

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.

- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
1. Place base course material over subbase course under hot-mix asphalt pavement.
 2. Shape subbase and base course to required crown elevations and cross-slope grades.
 3. Place subbase and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
 4. Place subbase and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
 5. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D1557.

3.17 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. (186 sq. m) or less of paved area, but in no case fewer than 3 tests.
 2. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 150 feet (46 m) or less of trench length, but no fewer than 2 tests.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Construction Manager; reshape and recompact.
 - C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.
- 3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS
- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION 321124 - AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 1.1 SUMMARY

- A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

1.2 SCOPE

- A. The work under this section of the specification shall consist of furnishing all labor, materials and equipment to produce, place, spread, compact and finish to proper grade and cross section all aggregate base courses according to the drawings and specifications.

1.3 SUBMITTALS

- A. Submit to the Landscape Architect a sieve analysis of the proposed stone to be installed.

PART 2 - PRODUCTS

4.1 2.1 MATERIALS

- A. Aggregate base material shall conform to DOT specifications for 21AA 100% crushed limestone and shall be placed and compacted to the minimum depth shown on plans. Crushed concrete, slag, etc. shall not be allowed.

1. Aggregate Sieve Analysis Percent Passing

1½"		100
1"		85-100
½"		50-75
No. 8		20-45
No. 200		4-8

PART 3 - EXECUTION

5.1 3.1 SUB-GRADE CONSTRUCTION

- A. The sub-grade shall be so constructed as to have uniform stability for a width at least equal to that of the proposed pavement plus one (1) foot on each side. It shall be brought to an elevation and cross section such that, after being rolled, the surface will be at the required elevation. At the time the sub-grade is prepared, the fill area shall have been constructed to the full width and to at least the elevation of the finished sub-grade.
- B. The material present in the next six (6) inches below the elevation of the sub-grade shall be scarified, mixed and re-compacted, or otherwise treated to produce a uniform condition. Stones

over four (4) inches in size shall be removed from the loosened portion of the sub-grade and disposed as directed by the project representative.

- C. Depressions that develop during the following shall be filled with suitable material, and the rolling shall continue until the sub-grade is uniformly firm, properly shaped and substantially true to grade and cross section. It shall be so maintained until the pavement is place.
- D. Material, other than sand, which will not compact readily under roller shall be removed and replaced with material which will compact readily and that portion of the sub-grade shall be rolled again.
- E. The rolling of the sub-grade shall extend for at least twelve (12) inches outside of each edge of the proposed turf boundaries when possible. Piles or ridges of earth or material that would seriously interfere with the operations of finishing the pavement shall not be left on the shoulders.
- F. During the process of construction sub-grade, the soil shall be maintained in a condition sufficiently moist to facilitate compaction and produce a firm, compact surface.
- G. If, in the preparation of the sub-grade, it becomes necessary to excavate below the elevation of the earth shoulders, ditches or drains shall be provided at frequent intervals to permit ready drainage of surface water from sub-grade to side ditches.
- H. If ruts or other objectionable irregularities form in the sub-grade during construction, the Contractor shall reshape and re-roll the sub-grade before the pavement is laid. The material used for filling ruts or other depressions shall be of such character as to make it equally desirable for sub-grade purposes as the material presented in the sub-grade.
- I. When the sub-grade is being prepared for placement as an aggregate base course, the elevation of the most finished surface, at the time the next layer is placed, shall not vary by more than 0.05 foot (1.52 cm) above or below the prescribed elevation at any point where measurement is made.

3.2 AGGREGATE BASE COURSE

- A. Base course construction shall proceed as follows only after the qualified testing firm has approved the sub-grade construction and the gravel tests.
- B. The base shall be constructed in layers of not more than three (3) inches (75mm) compacted thickness when conventional rolling equipment is used.
- C. If vibratory or other approved special equipment is used, the thickness of every compacted layer may be increased to a maximum of eight (8) inches (150mm).
- D. The finished surface of any aggregate base course shall not vary more than 0.02 foot (0.61 cm) from the elevations, grades and cross sections on the drawings.
- E. Compacted stone base dimensions shall be a minimum of 5" unless noted otherwise in plans.

3.3 COMPACTION REQUIREMENTS

- A. Sub-grade shall be compacted to not less than ninety-two percent (92%) of maximum density at not less than seventy-five percent (75%) of optimum moisture content.
- B. Aggregate base course shall be compacted to not less than ninety-five percent (95%) of maximum density. Using conventional rolling equipment, moisture content shall not be less than ninety percent (90%) nor more than one hundred-ten percent (110%) of optimum moisture content. Using vibrating equipment, moisture content shall not be less than seventy-five (75%) of optimum moisture content.
- C. Maximum density shall be determined in accordance with AASHTO Modified Method of Test for the Compaction and Density of Soil, Designation T-180, and the optimum moisture content shall be that corresponding to the maximum density in the above test.

1. 3.4 ROLLERS

- D. Smooth steel-wheeled rollers shall be self-propelled and have a total weight not less than 8 tons. The compression (driving) roller shall exert a pressure of not less than 250 lbs. per inch width of the roller.
- E. Pneumatic-tire rollers shall have a compacting width of sixty (60) inches (1.5m) or more and shall be capable of varying the weight from 100 to 250 lbs. per inch of rolling width.

END OF SECTION

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SECTION 321216 - ASPHALT PAVING

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- A. AI MS-22 - Construction of Quality Asphalt Pavements; 2020.
- B. ASTM D1073 - Standard Specification for Fine Aggregate for Asphalt Paving Mixtures; 2016 (Reapproved 2022).

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. Section Includes:
 - 1. Hot-mix asphalt paving.
- B. Related Sections:
 - 1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
 - 1. Job-Mix Designs: For each job mix proposed for the Work.
- B. Qualification Data: For qualified manufacturer and Installer.
- C. Material Certificates: For each paving material, from manufacturer.
- D. Material Test Reports: For each paving material.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by the Michigan Department of Transportation (MDOT).
- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.
- C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of Michigan Department of Transportation for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
 2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
 3. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
 4. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

PART 2 PRODUCTS

2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- C. Fine Aggregate: ASTM D1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
 1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
- D. Mineral Filler: ASTM D 242, rock, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: AASHTO M 320 or AASHTO MP 1a, PG 58-28.
- B. Asphalt Cement: ASTM D 3381 for viscosity-graded material, ASTM D 946 for penetration-graded material.
- C. Prime Coat: Asphalt emulsion prime coat complying with or local DOT requirements.
- D. Tack Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

- E. Water: Potable.
- F. The amount of Reclaimed Asphalt Pavement (RAP) should be limited to MDOT Tier 1 (0 to 17 percent RAP binder by weight) for wearing course mixtures and MDOT Tier 2 (18 to 27 percent RAP binder by weight) for leveling course mixtures.

2.3 MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and complying with the following requirements:
 - 1. Base Course: See Drawings.
 - 2. Surface Course: See Drawings.

2.4 AUXILIARY MATERIALS

- A. Joint Sealant: Crafcro Pavement Joint Adhesive, manufactured by Crafcro, Inc, or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.25 gal./sq. yd. or 1.0 gal./sq.yd. DILUTED with water.
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.3 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
 - 2. Place hot-mix asphalt surface course in single lift.

3. Spread mix at minimum temperature of 250 deg F (121 deg C).
 4. Begin applying mix on high side of one-way slopes unless otherwise indicated.
 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.
- 3.4 JOINTS
- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of 24 inches (609.6 mm).
 3. Offset transverse joints, in successive courses, a minimum of 24 inches (609.6 mm).
 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 6. Compact asphalt at joints to a density within 2 percent of specified course density.
- 3.5 COMPACTION
- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 96 percent of reference laboratory density according to ASTM D 6927 or AASHTO T 245, but not less than 94 percent nor greater than 100 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/4 inch (6 mm).
 - 2. Surface Course: Plus 1/4 inch (6 mm), no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch (6 mm).
 - 2. Surface Course: 1/8 inch (3 mm).

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

- B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.
 - 1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
 - 2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
 - a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than 3 cores taken.
 - b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
- E. Replace and compact hot-mix asphalt where core tests were taken.
- F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.8 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow milled materials to accumulate on-site.

END OF SECTION

SECTION 321313 - CONCRETE PAVING

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- A. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- C. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2026.
- D. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.
- E. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2024.
- F. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- G. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
- H. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.
- I. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- J. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2026.
- K. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. This Section includes exterior cement concrete pavement for the following:
 - 1. Walkways.
 - 2. Curbs.

B. Related Sections include the following:

1. Division 31 Section "Earth Moving" for subgrade preparation, grading, and subbase course.

1.4 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.5 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C94/C94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM C1077 and ASTM E329 for testing indicated, as documented according to ASTM E 548.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
- C. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- D. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

PART 2 PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
1. Use flexible or curved forms for curves with a radius 100 feet (3048 cm) or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60 (Grade 420); deformed.
- B. Joint Dowel Bars: Plain steel bars, ASTM A615/A615M, Grade 60 (Grade 420). Cut bars true to length with ends square and free of burrs.
- C. Tie Bars: ASTM A615/A615M, Grade 60 (Grade 420), deformed.
- D. Hook Bolts: ASTM A307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:
 - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the Project:
 - 1. Portland Cement: ASTM C 150, Type IA, gray.
- B. Normal-Weight Aggregates: MDOT 6A limestone.
- C. Water: ASTM C94/C94M.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 - 2. Retarding Admixture: ASTM C494/C494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B.

2.5 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D994.

2.6 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
 1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.
- B. Proportion mixtures to provide normal-weight concrete with the following properties:
 1. Compressive Strength (28 Days): 4000 psi (27579.04 kPa).
 2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
 3. Slump Limit: 5 inches (127 mm), plus or minus 1 inch (25.4 mm).
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
 1. Air Content: 6-1/2 percent plus or minus 1.5 percent for 1-inch (25-mm) nominal maximum aggregate size.
- D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M. Furnish batch certificates for each batch discharged and used in the Work.
 - 1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
 - 1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
 - 3. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch (12.7 mm) require correction according to requirements in Division 31 Section "Earth Moving."
- C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
 - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
 - 1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
 - 2. Provide tie bars at sides of pavement strips where indicated.
 - 3. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 50 feet (1524 cm), unless otherwise indicated.
 - 2. Extend joint fillers full width and depth of joint. Install joint filler in accordance with manufacturer's instructions.
 - 3. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 - 4. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
- E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site.
- F. Do not add water to fresh concrete after testing.
- G. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- I. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Place top layer of concrete, strike off, and screed.
 1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.
- J. Screed pavement surfaces with a straightedge and strike off.

- K. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- L. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
- M. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
 - 2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 - 1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (304.8 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 - 1. Elevation: 1/4 inch (6.35 mm).
 - 2. Thickness: Plus 3/8 inch (9.52 mm), minus 1/4 inch (6.35 mm).
 - 3. Surface: Gap below 10-foot- (3-m-) long, unlevelled straightedge not to exceed 1/4 inch (6.35 mm).

4. Joint Spacing: 3 inches (76.2 mm).
5. Contraction Joint Depth: Plus 1/4 inch (6.35 mm), no minus.
6. Joint Width: Plus 1/8 inch (3.18 mm), no minus.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 1. Testing Frequency: Obtain at least 1 composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mix placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C39/C39M; test 1 specimen at 7 days and 2 specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3447.38 kPa).
- D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days,

concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- G. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

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SECTION 329119 - TOPSOIL FOR LANDSCAPING & CONSTRUCTION

PART 1 – GENERAL

1.1 REFERENCE STANDARDS

- A. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.
- B. ASTM D4972 - Standard Test Methods for pH of Soils; 2019, with Editorial Revision (2024).

1.2 1.1 SUMMARY

- A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

1.3 RELATED REQUIREMENTS:

- A. Section 329113 Soil Preparation
- B. Section 329200 Turf and Grasses
- C. Section 329300 Plants
- D. Section 329600 Transplanting

1. DEFINITIONS

- a. ASTM: American Society for Testing and Materials
- b. CEC: cation exchange capacity
- c. Cm: Centimeter, unit of length in metric system
- d. Engineered Soil Amendment: in erosion control, an alternative to topsoil to accelerate development of depleted soils/substrates with low organic matter, low nutrient levels and limited biological activity.
- e. pH: a measure of how acidic or basic a liquid or solution is. It's measured on a scale from 0 to 14, with 7 being neutral. Values below 7 indicate acidity, and values above 7 indicate alkalinity (or basicity).
- f. Ppm: Parts Per Million, unit used to express concentration of a substance in a solution or mixture.
- g. Mmhos: "Millimhos", a unit of electrical conductivity specifically 1/1000th of a mho (also known as siemens). It's commonly used to measure the ability of a substance to conduct an electric current, particularly in water or soil.

- h. Saturated past extract: in soil testing, a mixture of soil or plant media created from a mixture of distilled water and soil or plant media used for obtaining soil testing values, the mixture usually creates a “paste” like material.
- i. SI units: International System of Units, also known as the metric system.
- j. Topsoil: in soil horizons, the naturally formed top horizon of ten designated as “A” horizon consisting of soils and materials which support the growth of plants and normally has a greater degree of weathering and greater accumulations of organic matter than underlying soil horizons or soil parent material.

2. REFERENCED DOCUMENTS

- 3. ASTM D18: Soil and Rock
- 4. ASTM D18.22: Media for Plant Growth
- 5. ASTM D653: Terminology Relating to Soil, Rock, and Contained Fluids
- 6. ASTM D2216: Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- 7. ASTM D2974: Test Methods for Determining the Water(Moisture) Content, Ash Content, and Organic Material of Peat and Other Organic Soils
- 8. ASTM D3740: Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction
- 9. ASTM D4972: Test Methods for pH of Soils
- 10. ASTM D6026: Practice for Using Significant Digits and Data Records in Geotechnical Data
- 11. World Trade Organization Technical Barriers to Trade (TBT) Committee.
- 12. Decision on Principles for the Development of International Standards

1.4 SCOPE

- A. This specification covers a physical evaluation of a soil containing organic material, relative to its use as a topsoil for vegetative growth purposes in landscaping and construction. For classification, a full agricultural textural classification may be used. Soils being evaluated for use as a topsoil must meet the requirements in Table 1.
- B. When physically evaluating a soil, relative to its suitability to support plant growth (primarily grasses), tests must be made to determine the presence and the amount of organic matter, moisture content, inorganic matter (sand, silt and clay), pH, salt content, cation exchange capacity percentages and deleterious materials.

- C. The presence in the soil of the correct nutrients, salts, and pH is necessary for healthy plant growth. This specification does not cover a determination of the nutrients, nor their availability.
- D. Typical ranges of topsoil composition are presented in Table 1. Silts falling within these ranges will generally form a suitable topsoil. Soils being used as a topsoil with organic matter contents between 10 and 90%, may need to be amended prior to use. It must, however, be recognized that in some geographic regions, achieving the values in Table 1 could be difficult. In such cases, alternative specifications may need to be considered, or an engineered soil amendment meeting the requirements in Table 1 excluding the sand, silt, and clay content as those materials will come from the subsurface soil being amended. When using an engineered soil amendment, the organic matter values need to be >75% to help rebuild the subsoil layers.
- E. Units – The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.
- F. All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026, unless superseded by this test method.
 - 1. The procedures used to specify how data are collected/recorded and calculated in the standard are regarded as the industry standard. In addition, they are representative of the significant digits that generally should be retained. The procedures used do not consider material variation, purpose for obtaining the data, special purpose studies, or any considerations for the user's objectives; and it is common practice to increase or reduce significant digits of reported data to be commensurate with these considerations. It is beyond the scope of these test methods to consider significant digits used in analysis methods for engineering data.

TABLE 1 Specification for Topsoil and Engineered Soil Amendment			
Property	Test Method or Technique	Requirement	
		Topsoil	Engineered Soil Amendment
pH	D4972	5.5-7.5	5.5-7.5
Organic Matter	D2974 (Method A)	3-10 %	≥75 %
Moisture Content	D2216 (Method A)	≤20 %	≤40 %
Material retained on 0.08 inch (2 mm) sieve	D6913/D6913M (Method A)	<5 %	<5 %
Sand Content (Material passing 0.08 inch (2 mm) and retained on 0 inch (0.08 mm) sieve	D6913/D6913M (Method A)	20-60 %	...

Fines (silt and clay) Content (Material passing 0 inch (0.08 mm) sieve)	D6913/D6913M (Method A)	35-70 %	...
Total Dissolved Solids (TDS)	Saturated Past Extract	<960 ppm	<960 ppm
Soluble Salt Concentration	Saturated Past Extract	<2.5 mmhos/cm	<2.5 mmhos/cm
Potassium (K)	Ammonium Acetate Extraction	3-10 % CEC	...
Magnesium (Mg)	Ammonium Acetate Extraction	12-25 % CEC	...
Calcium (Ca)	Ammonium Acetate Extraction	55-75 % CEC	...
Sodium (Na)	Ammonium Acetate Extraction	<5 % CEC	...

2. PHYSICAL PROPERTIES

G. Table 1 presents the requirements the topsoil or engineered soil amendment must meet.

1. ACTION SUBMITTALS

H. SAMPLING AND TEST SPECIMENS

1. Take a representative sample of the topsoil following the guidance given Test Methods D691/D6913M for sampling and specimen preparation. The total amount of representative samples sample needed will vary based on the maximum particle size of the topsoil or engineered soil amendment under evaluation. Each test method typically specifies a minimum dry mass required to perform the test; therefore, the representative sample shall be of such quantity that the needed amount of material for each of the test specimens is obtained. (In general for a topsoil with a maximum particle size of 4.75mm, the representative sample is usually between 500 and 1000 g.)
2. Thoroughly mix the representative sample to make sure each of the test specimens are representative of the sample.
3. Select the test specimens to be tested following the specimen mass requirements given in the individual test methods listed in Section B.

I. TEST METHODS

- a. 1. Agencies are required to meet the criteria of Practice ASTM D3470 for objective testing/sampling/ inspection/ etc. Use a test specimen for each to determine the:
- b. a. pH using test Methods D4672. Record the nearest 0.1 pH unit.

- c. b. organic matter using Test Method D2974, Method A. Record to the nearest 1 %.
- d. c. water content using Test Method D2216, Method A. Record to the nearest 1 %.
- e. d. particle-size gradation using Test Methods D6913/D6913M, Method A. Record to the
 - 1) nearest 1 % the amount retained on the 0.08 inch (2 mm), the amount of material
 - 2) passing the 0.08 inch (2 mm) and retained on the 0 inch (0.08 mm) sieve (sand
 - 3) content), and the amount of material passing the 0 inch (0.08 mm) sieve (fines content).
 - 4) e. During soaking and washing, take care to agitate the specimen so that as much as
 - 5) practicable, the organic matter is decanted away.
 - 6) f. total dissolved solids using the Saturated paste Extract method. Record to the nearest 1
 - 7) ppm.
 - 8) e. soluble salt concentration using the Saturated Paste Extrat method. Record to the nearest

0.01 MMHOS/CM.

- 1) f. potassium using the ammonium acetate extraction method. Record to the nearest 1 %
- 2) CEC.
- 3) g. magnesium using the ammonium acetate extraction method. Record to the nearest 1 %
- 4) CEC.
- 5) h. calcium using the ammonium acetate extraction method. Record to the nearest 1 % CEC.
- 6) i. sodium using the ammonium acetate extraction method. Record to the nearest 1 % CEC.

2. INFORMATIONAL SUBMITTALS

3. CERTIFICATE

- a. Prepare a certificate that includes pertinent information regarding the materials and testing performed. The certificate must include the results of the testing, the requirements listed in Table 1, and the status of the testing: requirement was or was not met.

END OF SECTION

SECTION 329200 - NATURAL TURF & SODDING

NATURAL TURF & SODDING

PART 1 GENERAL

2.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

2.2 SUMMARY

- A. Section Includes:

- 1. Seeding, Hydroseeding, mulching and fertilizer.
 - 2. Erosion-control material(s).
 - 3. Temporary Maintenance.

- B. Related Sections:

- 1. Section 013300 – Submittals and Substitutions
 - 2. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
 - 3. Section 312000 "Earth Moving" for excavation, filling and backfilling, and rough grading.
 - 4. Section 312500 "Soil Erosion and Sedimentation Controls"
 - 5. Section 329200 "Topsoil"
 - 6. Section 329300 "Exterior Plants"

2.3 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and

molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and fertilizers to produce a soil mixture best for plant growth.
- G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- H. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
- I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

2.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.
 - 2. Seed Mix Data
 - 3. Fertilizer Data
 - 4. Weed Control Data
 - 5. Maintenance Data: The Contractor shall furnish to the Owner and the Landscape Architect, a written schedule of advised maintenance procedures which the Owner should follow during the guarantee period. This will include a watering schedule which shows amounts of water to be applied and frequency of application for all contractual plant material and lawn areas. This schedule must be submitted prior to final acceptance by the Landscape Architect. The Owner will undertake no maintenance until the final acceptance. Final acceptance will be given upon completion of all work as defined in the contract and above conditions are met satisfactorily as determined by the Landscape Architect.
 - 6. Application Records shall be submitted at the end of the project. See Execution Section for additional detail.

2.5 INFORMATIONAL SUBMITTALS

- A. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - 1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of suppliers.
- B. Qualification Data: For qualified landscape Installer.
- C. Product Certificates: For soil amendments and fertilizers, from manufacturer.

2.6 QUALITY ASSURANCE

- A. Qualification of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the work, who shall be thoroughly familiar with the type of materials being installed and the proper materials and methods for their installation, and who shall direct all work performed under this section.
- B. A pre-installation conference may be called to address concerns related to timing, seasonal concerns, weather conditions, or execution.
- C. Preliminary Investigations: The Contractor shall visit the site and make his own interpretation of conditions, based on his investigation of existing conditions and on soil conditions. Where underground services, utilities, structures, etc. are located on the drawings or given at the site, they are based on available records but are not guaranteed to be complete or correct. They are merely available for assistance.
- D. Comply with regulatory agencies for fertilizer and herbicide composition.
- E. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 2. Pesticide Applicator: State licensed, commercial.

2.7 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- B. Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

- C. Give all tags to Construction manager for record
- D. Deliver fertilizer and weed control products in waterproof bags showing weight, chemical analysis, and name of manufacturers.
- E. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

2.8 PROJECT CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion. If field is irrigated with built system, planting restrictions do not apply and may be planted immediately.
 - 1. Spring Planting: April 15 through May 15, within 55° - 75° soil temperatures.
 - 2. Fall Planting: August 15 through September 15, within 55° - 75° soil temperatures.
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

2.9 MAINTENANCE SERVICE

- A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
 - 1. Seeded Turf: 180 days from date of Substantial Completion.
 - a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2.10 WARRANTY

- A. All seeding shall carry a full replacement guarantee for one (1) full growing year from date of acceptance by Landscape Architect/Civil Engineer.

- B. Any seeding that, in the opinion of the Landscape Architect/Civil Engineer, requires reseeding shall be reworked to meet the original specifications requirements.
- C. The contractor will not be responsible for plant material that has been damaged by vandalism, fire, removal, relocation, losses due to abnormal weather conditions, non-irrigated areas or other activities beyond the Contractor's control.

PART 2 PRODUCTS

3.1 SEED MIXTURES

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 90 percent pure seed, and not more than 0.5 percent weed seed:
 - 1. (Specified seed varieties may be substituted for equal or better as approved by Landscape Architect/Civil Engineer)
 - 2. Type "C" Mix: "EGS Quality 50/50" (4-6 lbs. /1000)
 - a. fine lawn, residential, general purpose sports fields, overseeding
 - 1) 24.94% Sox Fan or Showtime Perennial Ryegrass
 - 2) 19.78% Secretariat II GLSR or Gray Star Perennial Ryegrass
 - 3) 14.94% Blue Bonnet or Avalanche Kentucky Blue Grass
 - 4) 14.93% Lunar or Blue Star Kentucky Blue Grass
 - 5) 14.85% Shannon or Gaelic Kentucky Blue Grass

3.2 FERTILIZERS

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 15% percent derived from natural organic/(insoluble) sources of urea formaldehyde, phosphorous, and potassium in the following composition:
- B. Provide a commercial balanced fertilizer delivered to the site in bags labeled with the manufacturer's guaranteed analysis. If stored at the site, protect fertilizer from the elements at all times.
 - 1. Fertilizer "A": applied at the time of seeding at 50 lbs. per 8000 sq feet (8.61141 sq cm).
 - a. 16-32-4 (14.3% Ammoniacal Nitrogen, 1.7% Urea Nitrogen, 32% Phosphorous, 4% Available Potassium)

2. Fertilizer “B”: applied 3-4 weeks after seeding at 50 lbs. per 10,000 sq feet (10.76426 sq cm).
 - a. 22-16-6 (6.3% Ammoniacal Nitrogen, 15.7% Urea Nitrogen, 16% Phosphorous, 6% Soluble Potassium).
 3. Fertilizer “C”; *Alternate* applied in addition to Fertilizer “A” at seeding and Fertilizer “B” at 3 week application at 50 lbs. per 3,500 sq feet (3.76749 sq cm).
 - a. Healthy Grow 4-2-2 (2.15% Ammoniacal Nitrogen, 1.85% Water Insoluble Nitrogen, 2% Available Phosphorous, 2% Available Potassium, 8% Calcium, 0.8% Sulfur, complete Mycorrhiza and Bacterial Package, sea plant meal, molasses meal, yacca extract.
- C. Crabgrass Control:
1. Starter: Mesotrione (5 oz acre) – to be added to the Hydromulch mixture at seeding in all seed mixes with less than 25% fescues.
 2. Maintenance: Quinclorac (1 lbs. /acre) to be sprayed as a post emergent.
- D. Weed Control: Trimec 92, T-Zone, Horsepower, Surge or comparable. Submit product data to Landscape Architect/Civil Engineer for review.

3.3 SOIL MATERIALS

- A. Planting Soil: Topsoil to be fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, and taken from drained site. It is to be free of subsoil, clay or impurities, plants, weeds, roots, sod, stones and other extraneous materials harmful to plant growth with a pH value of minimum 6.4 and maximum 7.6. Minimum depth to be 6” in planting beds, or 4” min. in turf areas unless otherwise noted in Topsoil and Exterior Planting Specification Sections.
 1. A complete soil test must be submitted to a reputable soil testing facility prior to being spread on site to identify any nutrient deficiencies and determine soil pH levels.
- B. See soil specification section 329200 “Topsoil” for expanded needs and details.

3.4 MULCHES

- A. All Mulches shall be free from noxious weeds and foreign materials.
 1. Hydromulch: Deliver to the site in sealed containers with manufacturer’s guaranteed analysis. All seeding shall be hydromulched after drill seeding.
 - a. Hydromulch shall be a minimum of 20-40% recycled paper and 60-80% thermos-mechanically processed wood fiber.
 - b. Hydromulch shall include a polymer tactifier.

2. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
 3. Peat mulch in first paragraph below may be required if seeded turf is subject to hot, dry weather or drying winds within 30 days of planting.
 4. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
 5. Fiber mulch in paragraph above and nonasphaltic tackifier in first paragraph below are primarily used to protect hydroseeded areas from wind and water erosion during establishment.
 6. Non-asphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturers for slurry application; nontoxic and free of plant-growth or germination inhibitors.
- B. Apply a water absorbent aqua gel as a moisture manager to all non-irrigated areas that have been seeded.
 - C. Asphalt emulsion in paragraph below may be used as a tackifier in a hydroseeding slurry or to temporarily bond straw mulch in place.

3.5 PESTICIDES

- A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

3.6 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (152.4 mm) long.
- B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (152.4 mm) long.

- C. Erosion-Control Mats: Cellular, non-biodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, of 3-inch nominal mat thickness. Include manufacturers' recommended anchorage system for slope conditions.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Invisible Structures, Inc.; Slopetame 2.
 - b. Presto Products Company, a business of Alcoa; Geoweb.
 - c. Tenax Corporation - USA; Tenweb.
- D. Hydromulch slopes greater than 1: 4.

PART 3 EXECUTION

4.1 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Do not mix or place soil and soil amendments in frozen, wet, or muddy conditions.
 - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

4.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.

- B. Install erosion-control measures to prevent erosion or displacement of soil and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

4.3 TOLERANCE

- A. Sodded areas will be allowed a tolerance of 0.1 foot (3.05 cm).
- B. Slope for drainage over turf areas shall have a minimum grade of 1.0%.
- C. Sodding shall not be done on soil that has been chemically treated until sufficient time has elapsed to permit dissipation of all toxic materials. The Contractor shall assume full responsibility for any loss or damage to turf arising from improper dissipation of toxic residues, whether or not such materials are specified herein.

4.4 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches (152.4 mm). Remove stones larger than 1 inch (25.4 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Spread planting soil to a depth of 6 inches (152.4 mm) but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet. Final planting soil compaction must not exceed 85 percent.
 - a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches (50.8 mm) of subgrade. Spread remainder of planting soil.
 - b. Reduce elevation of planting soil to allow for soil thickness of sod.
- C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
 - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 - 2. Loosen surface soil to a depth of at least 8 inches (203.2 mm). Apply soil amendments and fertilizers as instructed and mix thoroughly into top 4 inches (101.6 mm) of soil. Till soil to a homogeneous mixture of fine texture.
 - 3. Remove stones larger than 1 inch (25.4 mm) in any dimension and sticks, roots, trash, and other extraneous matter.
 - 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (12.7 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

4.5 PREPARATION FOR EROSION-CONTROL MATERIALS

- A. Prepare area as specified in "Turf Area Preparation" Article.
- B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.
- C. Fill cells of erosion-control mat with planting soil and compact before planting.
- D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

4.6 FERTILIZING

- A. Apply fertilizer in accordance with Manufacturer's/Distributor's instructions.
- B. Apply starter fertilizer after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply fertilizer at same time or with same machine as will be used to apply seed unless combined together in the hydromulching mixture.
- D. Fertilizer "A": Apply starter fertilizer at time of planting.
- E. Fertilizer "B": Apply three (3) weeks and seven (7) weeks after planting.
- F. Notify in writing the Owner of future fertilization requirements when grass has been approved by Landscape Architect/Civil Engineer.
 - 1. Note #1 – Alternate. In situations where rapid establishment is required or stress potential is high due to temperature (mid-summer seeding), include applications of Fertilizer "C" in Section 2.2 Healthy Grow 4-2-2 (50 lbs. /3500 sq.) at seeding in a

4.7 SEEDING

- A. Drill Seed: All seeding shall first be drill seeded to ensure soil contact. Seed in two separate directions at opposing 45 degree angles.
- B. Apply seed at the Application Rate noted in Section 2.1.
- C. Do not seed areas in excess of that which can be mulched on same day.
- D. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- E. Immediately following seeding and compacting, apply mulch at the rate indicated in Section 3.8. Maintain clear of all other objects.
- F. Following germination, immediately re-seed areas without germinated seeds that are larger than 8 by 8 inches (203.2 mm).

4.8 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
 - 1. For all non-irrigated areas, slit seeding shall happen first before application.
 - 2. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
 - 3. Apply slurry uniformly to all areas to be seeded. Apply slurry at a rate so that mulch component is deposited at not less than 2000-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

4.9 HYDROMULCH

- A. Apply seeded slurry with a hydraulic seeder at a rate of 1,750 lbs. per acre evenly after drill seeding.
- B. Do not Hydromulch area in excess of that which can be mulched on same day.
- C. Allow Hydromulch to dry and bond to the soil prior to beginning watering program.

4.10 PROTECTION

- A. Identify seeded areas with stakes and string around area periphery. Set string height to 36 inches (914.4 mm). Space stakes at 20 feet (609.6 cm) max.
- B. Cover seeded slopes with erosion fabric as noted on plans or if required.

4.11 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
 - 1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
 - 2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
 - 3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (101.6 mm).
 - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 - 2. Water turf with fine spray at a minimum rate of 1 inch (25.4 mm) per week unless rainfall precipitation is adequate.

4.12 MOWING SEED

- A. When grass reaches 2.5" in height, mow to 2" in height. Maintain grass between 2" and 2-1/2" in height. Do not cut off more than 30% of grass leaf in single mowing. Do not remove grass clippings.
- B. A minimum of four (4) mowings will be required, or until turf is accepted.
- C. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.

4.13 WEED CONTROL

- A. Apply herbicides 1-2 days after the fourth mowing. Apply herbicide to control weed growth per manufacturer's label rates.
- B. 4 weeks after germination with adequate moisture for post-emergent herbicide; use Quinclorac for grassy weeds and Three-Way for broadleaf weeds.

4.14 IRRIGATION

- A. Contractor shall closely monitor watering of newly seeded areas. Seed must be kept moist at all times. Multiple light waterings per day as weather dictates. Watering must be monitored carefully to avoid overwatering/standing water. Watering times are to be adjusted frequently to maintain adequate moisture levels at all times until complete grass establishment is achieved and accepted by Landscape Architect/Civil Engineer.

4.15 APPLICATION RECORDS

- A. Contractor shall notify and clarify with Construction Manager all fertilization applications, weed control applications, etc. at time of application. This information shall be written down and logged in the trailer on a daily basis. Seed mix tags, fertilizer bag tags, weed control tags, and Hydromulch tags shall be submitted to Construction Manager prior to daily installation.

4.16 MAINTENANCE

- A. Provide maintenance as required by this specification at no additional cost until seeding has been accepted by the Landscape Architect/Civil Engineer.
- B. Neatly trim edges and hand clip where necessary.
- C. Water to prevent grass and soil from drying out. Coordinate with Owner.
- D. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.
- E. Immediately reseed areas that show bar spots.
- F. Protect seeded areas with warning signs during maintenance period.
- G. Weed kill all areas where grass is growing in beds, sidewalk cracks, maintenance strips, etc.

4.17 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Landscape Architect/Civil Engineer:
 - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches (127 mm).
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

4.18 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

4.19 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas. If seeding operations result in tracking or spilled material on paved surfaces the Contractor will be required to sweep and wash surfaces.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period. Remove all barriers and signs from project site at termination of establishment period.
- C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION

SECTION 329410 - ENGINEERED WOOD FIBER

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- A. ASTM F1292 - Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment; 2022.

1.2 SUMMARY

- A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.
- B. All products supplied shall submit certification that material meets the current Consumer Product Safety Commission and ADA requirements.

1.3 SCOPE

- A. The work under this section shall consist of furnishing all labor, materials and equipment for the installation of an engineered wood fiber bark mulch in accordance to the drawings and specifications.

1.4 QUALITY ASSURANCE

- A. Reference Standards:

- 1. American Society for Testing and Materials (ASTM):
 - a. ASTM F1951 – Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
 - b. ASTM F1292 – Standard Specification for Impact Attenuation of Surfacing Materials Within the Use Zone of Playground Equipment
 - c. ASTM F20785 – Standard Specification for Engineered Wood Fiber for use as a Playground Safety Surface Under or Around Playground Equipment.

1.5 SUBMITTALS

- A. Manufacturer's Literature: Furnish to Architect, when required and copies of manufacturer's specifications. Include photographs, catalogue cuts, samples as may be required to show compliance with these specifications.
- B. Testing Data Relating to the following:
 - 1. Critical height based on ASTM F1292 impact attenuation testing

2. Minimum fill, 0-depth data
3. Toxicity
4. ADA/ABA accessibility guidelines for firmness and stability based on ASTM F1951.

PART 2 – PRODUCT

2.1 ACCEPTABLE MANUFACTURERS

- A. Sof Fall Manufactured by: Sof Fall
 1. Ashton, Idaho
 2. 800-523-8690 (Elouise)
- B. Cushion Wood Manufactured by: Kamps Wood Resources
 1. Grand Rapids MI 49504
 2. 616-453-1986
- C. Safe Site System Manufactured by: Safe Site Systems
 1. Cincinnati, OH 45248
- D. WoodCarpet Manufactured by: Zeager Bros. Inc.
 1. Middletown, PA 17057-9954
 2. 800-346-8524
- E. Fibar Systems Manufactured by: Fibar Group
 1. Mamaroneck, NY
 2. 800-342-2721

PART 3 – EXECUTION

3.1 INSTALLATION

- A. The bark mulch shall be furnished and installed as per the details and manufacturers recommendations.

END OF SECTION