RIGLER ELEMENTARY GREEN SCHOOLYARD IMPROVEMENTS

BY:

ESTUARY PARTNERSHIP
PORTLAND PUBLIC SCHOOLS

RIGLER ELEMENTARY SCHOOL
5401 NE PRESCOTT ST
PORTLAND, OR 97218

BID SET

DATE: 04-09-2025

Prepared By:

JUNCUS STUDIO

SECTION 000103
PROJECT DIRECTORY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Identification of project team members and their contact information.

1.02 PROJECT OWNER:

Estuary Partnership

Chris Hathway, Community Programs Manager

Email: CHathaway@estuarypartnership.org

1.03 PROPERTY OWNER:

Portland Public Schools

Theresa Fagin, Project Manager

Email: tfagin@pps.net

1.04 CONSULTANT:

A. Landscape Architect: Design Professional of Record. All correspondence from the Contractor regarding construction documents authored by Landscape Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.

Juncus Studio

5200 S Macadam Ave, Suite 210

Portland, OR 97239

Telephone: 503-715-5453.

Dave Elkin, Principal

Email: dave@juncusstudio.com

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 000107
SEALS PAGE

PROJECT SPECIFICATIONS PREPARED BY:

JUNCUS STUDIO

END OF SECTION

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SECTION 011000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Rigler Elementary Green Schoolyard Improvements

B. Project Owner: Lower Columbia Estuary Partnership

C. Property Owner: Portland Public Schools

D. Landscape Architect: Juncus Studio

E. The Project consists of the construction of stormwater facilities, planting beds, and play area expansion within a schoolyard.

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in the Agreeement.

1.03 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.

1.04 WORK BY OWNER

A. Property Owner will supply the following for installation by Contractor:
   1. Play Area Swings

1.05 OWNER OCCUPANCY

A. Property Owner intends to occupy the Project upon Substantial Completion.

B. Cooperate with Project Owner to minimize conflict and to facilitate Property Owner's operations.

C. Schedule the Work to accommodate Property Owner occupancy.

1.06 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 Property 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. Time Restrictions:
   1. Limit conduct of especially noisy exterior work to the hours of 7:00 AM and 5:00 PM.

E. Utility Outages and Shutdown:
   1. Prevent accidental disruption of utility services to other facilities.

END OF SECTION

SECTION 013000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. CSI/CSC Form 12.1A - Submittal Transmittal; Current Edition.

B. CSI/CSC Form 13.2A - Request for Information; Current Edition.

1.02 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 017000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Landscape Architect:
   1. Requests for Interpretation (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Project Owner will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Project Owner.
   2. Property Owner
   3. Landscape Architect.
   4. Contractor.

C. Agenda:
   1. Execution of Project Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract and Landscape Architect.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Landscape Architect, Project Owner, participants, and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING

A. Project Owner will schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
   1. Contractor.
   2. Project Owner.

3. Property Owner
4. Landscape Architect.
5. Contractor's superintendent.
6. Major subcontractors.

C. Agenda:
1. Use of premises by Project Owner and Contractor.
2. Project Owner's requirements.
3. Construction facilities and controls provided by Project Owner.
4. Temporary utilities provided by Project Owner.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Application for payment procedures.
9. Procedures for testing.
10. Procedures for maintaining record documents.
11. Requirements for start-up of equipment.
12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Landscape Architect, Project Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

A. Project Owner will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:
1. Contractor.
2. Project Owner.
3. Landscape Architect.
4. Contractor's superintendent.
5. Major subcontractors.

C. Agenda:
1. Review minutes of previous meetings.
2. Review of work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Maintenance of progress schedule.
7. Corrective measures to regain projected schedules.
8. Planned progress during succeeding work period.
9. Maintenance of quality and work standards.
10. Effect of proposed changes on progress schedule and coordination.
11. Other business relating to work.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Landscape Architect, Project Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE

A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
1. Include written certification that major contractors have reviewed and accepted proposed schedule.

C. Within 10 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

3.05 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
   2. Prepare in a format and with content acceptable to Project Owner.
      a. Use CSI/CSC Form 13.2A - Request for Interpretation.
   3. Prepare using an electronic version of the form appended to this section.
   4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.

E. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.

F. Review Time: Landscape Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.

3.06 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Landscape Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 017800 - Closeout Submittals.

3.07 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 017800 - Closeout Submittals:

1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

D. Submit for Project Owner's benefit during and after project completion.

3.08 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Landscape Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.09 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a single transmittal for related items.
   2. Transmit using approved form.
      a. Use Form CSI/CSC Form 12.1A.
   3. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Send submittals in electronic format via email to Landscape Architect.

B. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
   2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

3.10 SUBMITTAL REVIEW

A. Submittals for Review: Landscape Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Landscape Architect will acknowledge receipt and review. See below for actions to be taken.

C. Landscape Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Landscape Architect's actions on items submitted for review:
   1. Authorizing purchasing, fabrication, delivery, and installation:
      a. "Approved", or language with same legal meaning.
      b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
         1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
      c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
   2. Not Authorizing fabrication, delivery, and installation:

E. Landscape Architect's actions on items submitted for information:
   1. Items for which no action was taken:
      a. "Received" - to notify the Contractor that the submittal has been received for record only.
   2. Items for which action was taken:
      a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 013553
SECURITY PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security measures including entry control and personnel identification.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: use of premises and occupancy.

1.03 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into Project site and existing facilities.

B. Allow entrance only to authorized persons with proper identification including PPS Contractor Badging.

1.04 PERSONNEL IDENTIFICATION

A. All Contractor and subcontractor personnel shall apply for security badges and background check through Portland Public Schools standard process. Fees for security badging and background checks to be paid by contractor.

B. PPS security badges to be worn at all times while on premises during construction.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 014000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Control of installation.

E. Defect Assessment.

1.02 REFERENCE STANDARDS

A. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2024.

B. 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.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Landscape Architect, in quantities specified for Product Data.

1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Landscape Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Controls: enclosures and fencing.

B. Security requirements.

C. Vehicular access and parking.

D. Waste removal facilities and services.

1.02 RELATED REQUIREMENTS

A. Section 015500 - Vehicular Access and Parking.

1.03 FENCING

A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks. Coordinate with Property Owner to include additional locks for Property Owner access.

1.04 SECURITY - SEE SECTION 013553

A. Provide facilities to protect Work, existing facilities, and Project Owner's operations from unauthorized entry, vandalism, or theft.

1.05 VEHICULAR ACCESS AND PARKING - SEE SECTION 015500

A. Coordinate access with Property Owner.

B. Provide and maintain access to fire hydrants, free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering streets.

D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, on-street parking is available.

1.06 WASTE REMOVAL

A. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.

B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

C. Provide containers with lids. Remove trash from site periodically.

D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

1.07 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 015500
VEHICULAR ACCESS AND PARKING

PART 1 GENERAL - NOT USED

1.01 SECTION INCLUDES

A. Access roads.

B. Parking.

C. Existing pavements and parking areas.

D. Permanent pavements and parking facilities.

E. Construction parking controls.

F. Maintenance.

G. Removal, repair.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: For access to site, work sequence, and occupancy.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ACCESS ROADS

A. Use of designated existing on-site streets and driveways for construction traffic is permitted.

B. Extend and relocate as work progress requires, provide detours as necessary for unimpeded traffic flow.

C. Provide and maintain access to fire hydrants free of obstructions.

3.02 PARKING

A. Use of designated areas of existing parking facilities by construction personnel is permitted.

3.03 CONSTRUCTION PARKING CONTROL

A. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.

3.04 MAINTENANCE

A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.

B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

3.05 REMOVAL, REPAIR

A. Repair existing facilities damaged by use, to original condition.

B. Repair damage caused by installation.

END OF SECTION

SECTION 015713
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Compensation of Project Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 REFERENCE STANDARDS

A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.

B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.

C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).

D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).

E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.

F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).

1.03 PERFORMANCE REQUIREMENTS

A. Comply with all requirements of the City of Portland for erosion and sedimentation control .

B. Follow City of Portland Erosion and Sedimentation Control Manual and permit requirements.

C. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
   1. Project Owner will obtain permits and pay for securities required by authority having jurisdiction.

D. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

E. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

F. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.
   2. Prevent development of ruts due to equipment and vehicular traffic.
   3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Project Owner.

G. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Project Owner.

H. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Project Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

I. Open Water: Prevent standing water that could become stagnant.

J. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

C. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.

B. Grass Seed For Temporary Cover: See Specification Section 329219.

C. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491/D4491M.
   3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
   4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
   5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
   6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.
   7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.

D. Silt Fence Posts: One of the following, minimum 5 feet long:

PART 3 EXECUTION

3.01 INSPECTION MEETINGS

A. Pre-Construction Compliance Inspection: Project Owner to schedule pre-construction compliance inspection by City of Portland to review installation of BMPs prior to ground-

disturbing activities.

B. Final Stabilization Compliance Inspection: Project Owner to schedule final inspection by the City of Portland to obtain final approval of final permit inspection.

3.02 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.03 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.04 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

C. Soil Stockpiles: Protect using one of the following measures:
   1. Cover with polyethylene film, secured by placing soil on outer edges.
   2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

D. Temporary Seeding: Use where temporary vegetated cover is required.

3.05 INSTALLATION

A. Silt Fences:
   1. Store and handle fabric in accordance with ASTM D4873/D4873M.
   2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
   3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
   4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
   5. Install with top of fabric at nominal height and embedment as specified.
   6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
   7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

B. Temporary Seeding: See Specification Section 329219.

3.06 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:
   1. Promptly replace fabric that deteriorates unless need for fence has passed.
   2. Remove silt deposits that exceed one-third of the height of the fence.
   3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Place sediment in appropriate locations on site; do not remove from site.

3.07 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Landscape Architect.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 017000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cleaning and protection.

D. Correction of the Work

E. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

F. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 015000 - Temporary Facilities and Controls: Temporary exterior enclosures.

C. Section 015713 - Temporary Erosion and Sediment Control: Additional erosion and sedimentation control requirements.

1.03 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Landscape Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.04 PROJECT CONDITIONS

A. Perform dewatering activities, as required, for the duration of the project.

B. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.

C. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work,

assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Landscape Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Landscape Architect, Project Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Landscape Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Landscape Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Landscape Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.

H. Periodically verify layouts by same means.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.

4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

E. Restore work with new products in accordance with requirements of Contract Documents.

F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

G. Patching:
1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.

3.07 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and clean areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.09 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.10 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

C. Clean debris from downspouts, overflow drains, area drains, and drainage systems.

D. Clean site; sweep paved areas, rake clean landscaped surfaces.

E. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.11 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
1. Provide copies to Landscape Architect and Project Owner.

B. Accompany Landscape Architect on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Landscape Architect when work is considered ready for Landscape Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Landscape Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Landscape Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Landscape Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Project Owner-occupied areas.

G. Notify Landscape Architect when work is considered finally complete and ready for Landscape Architect's Substantial Completion final inspection.

H. Complete items of work determined by Landscape Architect listed in executed Certificate of Substantial Completion.

3.12 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Project Owner.

END OF SECTION

SECTION 017419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Project Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood.
   5. Land clearing debris, including brush, branches, logs, and stumps; see Section 311000 - Site Clearing for use options.
   6. Concrete.
   7. Bricks.
   8. Asphalt paving: May be recycled into paving for project.
   9. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   10. Plastic buckets.

E. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.
   5. Incineration, either on- or off-site.

F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 015000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 017000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

D. Section 311000 - Site Clearing: Handling and disposal of land clearing debris.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 013000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 017000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

END OF SECTION

SECTION 017800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Warranties.

1.02 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Warranties:
   1. For equipment or component parts of equipment put into service during construction with Project Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WARRANTIES

A. Obtain warranties, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Project Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Co-execute submittals when required.

C. Retain warranties until time specified for submittal.

END OF SECTION

SECTION 024100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of built site elements.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 011000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

C. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 015713 - Temporary Erosion and Sediment Control.

E. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.

F. Section 017419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

G. Section 311000 - Site Clearing: Vegetation and existing debris removal; earth stripping and stockpiling.

H. Section 312200 - Grading: Rough and fine grading.

1.03 DEFINITIONS

A. Demolition: Dismantle, raze, destroy or wreck any building or structure or any part thereof.

B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.

C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Project Owner in ready-for-reuse condition.

D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.04 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 DEMOLITION

A. Remove paving and curbs required to accomplish new work.

B. Remove other items indicated, for relocation and recycling.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with requirements in Section 017000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Provide, erect, and maintain temporary barriers and security devices.
   2. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.

3. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
4. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
5. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
6. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

C. Do not begin removal until receipt of notification to proceed from Project Owner.

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Protect existing structures and other elements to remain in place and not removed.

F. Hazardous Materials:
1. If hazardous materials are discovered during removal operations, stop work and notify Landscape Architect and Project Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.

G. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Project Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Project Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
1. Verify construction and utility arrangements are as indicated.
2. Report discrepancies to Landscape Architect before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and required to accomplish new work.
1. Remove items indicated on drawings.

C. Protect existing work to remain.
1. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
2. Repair adjacent construction and finishes damaged during removal work.
3. Patch to match new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove materials not to be reused on site; comply with requirements of Section 017419 - Waste Management.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 032000
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

B. CRSI (DA4) - Manual of Standard Practice; 2024.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
   1. Deformed billet-steel bars.
   2. Unfinished.

B. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.02 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

B. Accommodate placement of formed openings.

END OF SECTION

SECTION 055000
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items.

1.02 RELATED REQUIREMENTS

A. Section 323300 - Site Furnishings:
   1. Log Bench Brackets
   2. Ball Stop Fencing

1.03 REFERENCE STANDARDS

A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

C. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

D. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Plates: ASTM A283/A283M.

B. Pipe: ASTM A53/A53M, Grade B Schedule 40, powdercoat finish in colors shown in drawings..

C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Decorative Ball Stop Fencing: Prepare shop drawings and submit to Landscape Architect for review and approval.

B. Fit and shop assemble items in largest practical sections, for delivery to site.

C. Fabricate items with joints tightly fitted and secured.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Log Bench Bracket: As detailed in plans.

B. Ball Stop Fencing: As detailed in plans and per shop drawings.

2.04 FINISHES

A. Log Bench Bracket: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating. Provide minimum 1.7 oz/sq ft galvanized coating.

B. Ball Stop Fencing: Powder-Coat Finish: Manufacturer's standard thermosetting polyester or acrylic urethane powder coating; minimum cured-film thickness of 1.5 mils.; colors as identified in drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Obtain approval prior to site cutting or making adjustments not scheduled.

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 RELATED REQUIREMENTS

A. Section 055000 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. PS 20 - American Softwood Lumber Standard; 2025.

C. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2018.

D. WWPA G-5 - Western Lumber Grading Rules; 2021.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials.

C. Samples: For rough carpentry members that will be exposed to view, submit one sample, 12by 12 inch in size illustrating wood grain, color, and general appearance.

D. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber salvaged from deconstruction or demolition of existing buildings or structures is preferred in lieu of sustainably harvested lumber provided it is clean, denailed, and free of paint and finish materials, and other contamination; identify source.

C. Lumber fabricated from recovered timber is permitted in lieu of sustainably harvested lumber, unless otherwise noted, provided it meets the specified requirements for new lumber and is free of contamination; identify source.

2.02 EXPOSED TIMBERS

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Moisture Content: Kiln-dry (20 percent maximum).

C. Surfacing: S4S.

D. Species: Western Cedar or Douglas Fir.

E. Grade: Clear Heart Structural.

2.03 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture. Provide screws or bolts, in sufficient length, to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.
   3. Expansion Anchor: Hilti Kwik Bolt TZ or approved equal.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

B. Ease edges of lumber to radius and edge conditions identified on the drawings.

3.02 INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Securely attach carpentry work to substrate by anchoring and fastening as indicated.

3.03 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

C. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

3.05 CLEANING

A. Waste Disposal: See Section 017419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 116813
PLAYGROUND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Playground layout and staking.

B. Concrete footings for playground equipment.

C. Playground equipment.

D. Location of each item of playground equipment is indicated on drawings.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Footings for playground equipment.

B. Section 312200 - Grading: Shaping subgrade to specified grade levels.

C. Section 321313 - Concrete Paving: Footings for playground equipment.

D. Section 321816.13 - Playground Protective Surfacing: Protective surfacing in playground area.

1.03 DEFINITIONS

A. Play Event: A piece of playground equipment that supports one or more play activities.

B. Use Zone: Area under and around a play event within which the ground surfacing must meet fall impact attenuation requirements of ASTM F1292 when tested at the fall height specified for the play event.

C. Fall Height: Vertical distance between the finished elevation of the designated play surface and the finished elevation of the protective surfacing beneath it, as defined in ASTM F1487.

D. Protective Surfacing: Resilient ground surfacing, specified in Section 32 1816.13. The characteristics of the protective surfacing are based on the fall height of the playground equipment. Changes in either the surfacing or the fall height, particularly reducing the resilience of the protective surfacing or increasing the fall height, will reduce safety-related performance.

E. Subgrade: Surface of the ground on which the protective surfacing is installed; the subbase for the protective surfacing is installed over the subgrade.

1.04 REFERENCE STANDARDS

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

B. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use; 2021.

C. CPSC Pub. No. 325 - Public Playground Safety Handbook; 2015.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Convene a meeting one week before starting earthwork for playground to discuss coordination between various installers.
   1. Require attendance by personnel responsible for grading and installers of playground equipment, protective surfacing, footings, and adjacent work.
   2. Include representatives of Contractor.
   3. Notify Landscape Architect at least 2 weeks prior to meeting.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Installer's qualification statement.

C. Executed warranty.

1.07 QUALITY ASSURANCE

A. Maintain one copy of the latest edition of ASTM F1487 and CPSC Pub. No. 325 at project site.

B. Installer Qualifications: Company certified by manufacturer for training and experience installing play events and equipment.

1.08 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide minimum one year warranty for playground equipment. Complete forms in Project Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Playground Equipment:
   1. GameTime, Inc: www.gametime.com/#sle.

2.02 PLAYGROUND EQUIPMENT - GENERAL

A. Playground Equipment: Swings, Property Owner provided, Contractor installed.

B. Design Assumptions: Because the safety of the playground depends on strict compliance with design criteria, this information is provided for Contractor's information.
   1. If deviations from specified dimensions, especially fall heights, is required, obtain approval prior to proceeding; follow approval request procedure as specified for substitutions.

C. Mount equipment on concrete footings, unless otherwise indicated.
   1. Protective Surfacing Depth: As indicated on drawings.
   2. Provide supports as required to mount equipment at proper height above finish and sub-grades to allow installation of sufficient depth of protective surfacing; portion of support below top of surfacing must comply with specified requirements for equipment.
   3. Paint portion of support that is intended to be installed below top surface of protective surfacing a different color, or mark in other permanent way, so that installers and maintainers of protective surfacing can easily determine whether sufficient depth has been installed.

D. Provide permanent label for each equipment item stating age group that equipment was designed for, manufacturer identification, and warning labels in accordance with ASTM F1487.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that playground area has been graded to subgrade elevations required and that excess soil, rocks, and debris have been removed.

B. Verify that playground equipment footings have been installed in proper locations and at proper elevations.

C. Verify location of underground utilities and facilities in playground area; damage to underground utilities and facilities will be repaired at Contractor's expense.

3.02 PREPARATION

A. Stake location of playground elements, including Use Zone perimeters, perimeter of protective surfacing, access and egress points, hard surfaces, walls, fences, and structures, and planting locations.

B. Stake layout of entire Use Zone perimeter before starting any work and before subbase under resilient surfacing is laid.
   1. Verify that Use Zone perimeters do not overlap hard surfaces, whether currently installed or not.
   2. Verify that Use Zones are free of obstructions that would extend into resilient portion of protective surfacing.

3. If conflicts or obstructions exist, notify Landscape Architect.
4. Do not proceed until revised drawings have been provided, showing corrected layout, and obstructions have been removed.

3.03 INSTALLATION

A. Coordinate work with preparation for and installation of protective surfacing specified in Section 321816.13; install protective surfacing after playground equipment installation.

B. Install concrete footings with top surface a minimum of 1/2 inch below required subgrade elevation.

C. Install in accordance with CPSC Pub. No. 325, ASTM F1487, manufacturer's instructions, and requirements of authorities having jurisdiction (AHJ).

D. Anchor equipment securely below bottom elevation of resilient surfacing layer.

E. Install without sharp points, edges or protrusions, entanglement hazards, pinch, crush, or shear points.

F. Do not modify play events on site without written approval of manufacturer.

G. Install required signage if not factory-installed.

3.04 FIELD QUALITY CONTROL

A. Project Owner or Project Owner's representative will inspect playground equipment after installation to verify that playground meets specified design safety and accessibility requirements.

B. Repair or replace rejected work until compliance is achieved.

3.05 CLEANING

A. Restore adjacent existing areas that have been damaged from the construction.

B. Clean playground equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation; clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer.

C. Clean playground area of excess construction materials, debris, and waste.

D. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction (AHJ).

3.06 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 311000
SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clearing and grubbing.

B. Earth stripping and stockpiling.

C. Repair and restoration.

D. Debris removal.

1.02 RELATED REQUIREMENTS

A. Section 024100 - Demolition: Removal of built elements and utilities.

B. Section 329300 - Plants: Relocation of existing trees, shrubs, and other plants; pruning.

1.03 REFERENCE STANDARDS

A. ANSI Z133 - American National Standard for Arboricultural Operations - Safety Requirements; 2017.

1.04 FIELD CONDITIONS

A. Ambient Conditions: Terminate work during hazardous environmental conditions according to 29 CFR 1910.266.

B. Temporary Erosion and Sediment Control: Comply with other requirements specified in Section 015713 - Temporary Erosion and Sediment Control.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sedimentation Barrier: See Section 015713 - Temporary Erosion and Sediment Control.

PART 3 EXECUTION

3.01 EXAMINATION

A. Comply with additional requirements specified in Section 017000 - Execution and Closeout Requirements.

B. Construction Fencing: See Section 015000 - Temporary Facilities and Controls.

3.02 PREPARATION

A. Coordinate work with utility companies; notify before starting work and comply with local requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Protect existing structures and other elements that are to remain.

E. Install sedimentation barrier according to Section 015713 - Temporary Erosion and Sediment Control.

3.03 CLEARING AND CONSTRUCTION

A. Completely clear areas to be occupied by construction for other improvements.

B. Clearing: Cut trees, stumps, shrubs, downed timber, and other vegetation for removal within identified area as indicated on drawings according to 29 CFR 1910.266. Follow recommendations of ANSI Z133 and best local practices for species involved.

C. Do not remove or damage vegetation beyond limits indicated on drawings.

D. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum subsoil disturbance.

3.04 EARTH STRIPPING AND STOCKPILING

A. Stripping:
   1. Remove topsoil within identified area:
      a. According to depth measurements.
   2. Remove topsoil within identified area as indicated on drawings.

B. Stockpiling:
   1. Place topsoil in identified areas as indicated on drawings:
      a. Pile depth not to exceed 8 feet.
      b. Protect piles from erosion.

3.05 REMOVED VEGETATION PROCESSING

A. Do not burn, bury, landfill, or leave on-site, except as indicated on drawings.

3.06 REPAIR AND RESTORATION

A. Remaining Existing Facilities, Utilities, and Site Features: If damaged due to this work, repair or replace to original condition.

B. Vegetation: Replace damaged or destroyed vegetation identified to remain as indicated on drawings at no cost to Project Owner:
   1. Outside removal limits.

3.07 DEBRIS REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and windblown debris from public and private lands.

3.08 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.

C. Leave site clean and ready to receive work.

END OF SECTION

SECTION 312200
GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rough grading.

B. Fine grading.

1.02 RELATED REQUIREMENTS

A. Section 311000 - Site Clearing.

B. Section 312316 - Excavation.

C. Section 329119 - Landscape Grading.

1.03 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.01 MATERIALS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify survey bench mark and intended elevations for grading areas are as indicated.

B. Verify the absence of standing or ponding water.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Provide temporary means and methods to remove standing or ponding water from areas prior to grading.

D. Remove topsoil in accordance with Section 311000.

E. Excavate materials in accordance with Section 312316.

3.03 ROUGH GRADING

A. Excavate and fill subgrade material to elevations indicated on plans.

B. Remove and replace unsuitable materials as specified fill.

3.04 FINE GRADING

A. Scrape and spread subgrade material uniformly smooth and without disruptions as indicated on drawings.

B. Slopes: Transition smoothly to adjacent areas.

3.05 TOLERANCES

A. Top Surface: Plus or minus 1/2 inch.

3.06 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Leave site clean and raked, ready to receive work.

END OF SECTION

SECTION 312316
EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating for paving and site structures.

1.02 RELATED REQUIREMENTS

A. Section 015713 - Temporary Erosion and Sediment Control: Slope protection and erosion control.

B. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring. General requirements for dewatering of excavations and water control.

C. Section 312200 - Grading: Grading.

D. Section 329119 - Landscape Grading.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Field Quality Control Submittals: Document visual inspection of load-bearing excavated surfaces.

PART 2 PRODUCTS

2.01 MATERIALS

A. Bedding and Fill to Correct Over-Excavation:

B. Underground Warning Tapes:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Locate, identify, and protect utilities that remain and protect from damage.

C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

D. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by Landscape Architect.

3.03 EXCAVATING

A. Excavate to accommodate new structures and construction operations.
   1. Excavate to the specified elevations.

B. Notify Landscape Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Remove lumped subsoil, boulders, and rock up to 1/3 cubic yard measured by volume.

E. Provide temporary means and methods, as required, to remove all water from excavations until directed by Landscape Architect. Remove and replace soils deemed suitable by classification

and which are excessively moist due to lack of dewatering or surface water control.

3.04 FILLING AND BACKFILLING

A. Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation.

B. Install underground warning tape at buried utilities according to Sections 210553, 220553, 230553, and 260553.

C. See Section 329119 for topsoil placement and finish grading.

3.05 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for field inspection and testing.

B. Provide for visual inspection of load-bearing excavated surfaces by Landscape Architect before placement of foundations.

3.06 CLEANING

A. Stockpile excavated material to be re-used in area designated on site in accordance with Section 312200.

B. Remove excavated material that is unsuitable for re-use from site.

C. Remove excess excavated material from site.

3.07 PROTECTION

A. Divert surface flow from rains or water discharges from the excavation.

B. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

C. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition.

D. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

E. Keep excavations free of standing water and completely free of water during concrete placement.

END OF SECTION

SECTION 312316.13
TRENCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Trench excavation.

B. Utility bedding and cover.

C. Backfill and compaction.

1.02 RELATED REQUIREMENTS

A. Section 311000 - Site Clearing.

B. Section 312200 - Grading.

C. Section 312316 - Excavation.

D. Section 328423 - Underground Sprinklers

E. Section 329119 - Landscape Grading.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate trenching with utility installation.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Comprised of sand and gravel; free of shale, clay, friable materials, and debris.

B. Sand: Natural river or bank, washed free of silt, clay, loam, friable or soluble materials, and organic matter.

2.02 ACCESSORIES

A. Underground Warning Tape: Suitable for direct burial.

1. Bright-colored, continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mils, 0.004 inch thick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify survey benchmarks and intended elevations for work are as indicated on drawings.

B. Perform assessment of adjacent structures and exterior improvements to establish existing conditions. Notify Landscape Architect of existing cracks, sags, or other damages prior to starting work.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 311000 for site clearing and topsoil removal.

C. Protect existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

D. Locate and identify existing utilities to remain as indicated on drawings and protect from damage.

3.03 TRENCH EXCAVATION

A. General: Cut trenches neat and clean.

1. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
2. Cut trenches wide enough to allow inspection of installed utilities.
3. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

B. Utility Preparation: Rake trench bottom to uniform grade.

1. Remove unsuitable subgrade and backfill.
2. Compact subgrade to density equal to or greater than subsequent fill material requirements.

C. Maintain trenches and prevent loose soil or rocks from entering.

D. Notify Landscape Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

3.04 UTILITY BEDDING AND COVER

A. Maintain trenches and prevent loose soil or rocks from entering.

B. Sand: Compact in maximum 8-inch lifts to 95 percent of maximum dry density.
1. Bedding: Fill to subgrade elevation; rake smooth.

3.05 BACKFILL AND COMPACTION

A. Fill to subgrade elevations unless otherwise indicated on drawings.

B. General Fill: Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.

C. Compaction Density Unless Otherwise Specified or Indicated:
1. Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density.

D. Reshape and re-compact fills subjected to vehicular traffic.

E. Underground Warning Tape:
1. Install 6 to 8 inches below finished grade, directly above buried pipe.

F. Buried Detection Wire: Install 6 to 8 inches below finished grade, directly above buried pipe.

3.06 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Stockpile excavated material re-used in area designated on-site; see Section 312200.

C. Remove excavated material unsuitable for re-use from site.

D. Remove excess excavated material from site.

SECTION 320190
OPERATION AND MAINTENANCE OF PLANTING

PART 2 PRODUCTS

PART 3 EXECUTION

2.01 EXAMINATION

A. If soil analysis has not already been performed, take sufficient samples to obtain a comprehensive analysis; perform analysis in accordance with ASTM D4972.

2.02 LANDSCAPE MAINTENANCE - GENERAL

A. Protect existing vegetation, pavements, and facilities from damage due to maintenance activities; restore damaged items to original condition or replace, at no extra cost to Project Owner.

B. General Cleanup: Remove debris from all landscape areas at least once a week.
   1. Debris consists of trash, rubbish, dropped leaves, downed branches and limbs of all sizes, dead vegetation, rocks, and other material not belonging in landscaped areas.
   2. Remove debris from site and dispose of properly.

C. Watering, Soil Erosion, and Sedimentation Control: Comply with federal, state, local, and other regulations in force; prevent over-watering, run-off, erosion, puddling, and ponding.
   1. Repair temporary erosion control mechanisms provided by others.
   2. Repair eroded areas and replant, when caused by inadequate maintenance.
   3. Prevent sediment from entering storm drains.

D. Trees: Trees will be maintained by others.

E. Fertilizing: Apply fertilizer only when necessary.

F. Drainage Channels: Remove obstructions in gutters, catch basins, storm drain inlets, swales, and overflows.
   1. Remove grates from catch basins to clean.
   2. Prevent encroachment of other vegetation on inlets.

G. Health Maintenance: Inspect all plants regularly for health:
   1. Eradicate diseases and damaging pests, regardless of severity or speed of effect.
   2. Treat accidental injuries and abrasions.
   3. If a plant is unhealthy but not yet dead, according to specified definitions, determine reason(s) and take remedial action immediately.
   4. Remove dead plants immediately upon determining that they are dead.

H. Pesticide and Herbicide Application: Comply with manufacturer's instructions and recommendations and applicable regulations.
   1. Obtain Property Owner's approval prior to each application.
   2. Apply in manner to prevent injury to personnel and damage to property due to either direct spray or drifting, both on and off Property Owner's property.
   3. Use backflow preventers on hose bibbs used for mixing water; prevent spills.
   4. Inspect equipment daily before application; repair leaks, clogs, wear, and damage.
   5. Do not dispose of excess mixed material, unmixed material, containers, residue, rinse water, or contaminated articles on site; dispose of off site in legal manner.
   6. Rinse water may be used as mix water for next batch of same formulation.
   7. Contractor is responsible for all recordkeeping, submissions, and reports required by laws and regulations.

I. Replanting: Perform replacement and replanting immediately upon removal of dead plant.

2.03 IRRIGATION

A. Irrigation: Do not allow plants to wilt; apply water as required to supplement rainfall; do not waste water; do not water plants or areas not needing water; do not water during rainfall; shut

off water flow when finished; repair leaks.

2.04 SHRUB MAINTENANCE

A. Shrubs will be considered dead when 25 percent or more of plant has died.

B. Inspect woody plants for health by scraping up to 1/16 inch square area of bark; no green cambium layer below bark shall be evidence of death.

C. Adjust stakes, guys and turnbuckles, ties, and trunk wrap as required to promote growth and avoid girdling.

D. Pruning: Unless otherwise indicated, prune only to maintain balanced natural shape; follow recommendations of ANSI A300 and ANSI Z133.1 and best local practices for species involved.

E. Shrubs: Prune at least once during maintenance period at best time to influence ultimate shape and size for the particular species.
   1. Prune to balance the plant's form and according to its natural growth characteristics.
   2. Remove water shoots, suckers, and branches not complying with desired shape and size.

F. Hedges: Trim to encourage growth into voids and gaps.

2.05 CLEANING

A. Remove fallen deciduous leaves in Fall; remove at least once a week.

B. Clean adjacent pavements of plant debris and other debris generated by maintenance activities.

C. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner; Property Owner's trash collection facilities may not be used; dispose of off site in accordance with applicable regulations.

D. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner.
   1. Biodegradable Debris: Remove and recycle off-site at an appropriate composting facility.
   2. Non-Biodegradable Debris: Property Owner's trash collection facilities may not be used; dispose of off site in accordance with applicable regulations.

END OF SECTION

SECTION 321123
AGGREGATE BASE COURSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.

B. Paving aggregates.

1.02 RELATED REQUIREMENTS

A. Section 312200 - Grading: Preparation of site for base course.

B. Section 321216 - Asphalt Paving: Finish and binder asphalt courses.

C. Section 321313 - Concrete Paving: Finish concrete surface course.

1.03 REFERENCE STANDARDS

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil–Aggregate Subbase, Base, and Surface Courses; 2017 (Reapproved 2021).

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Materials Sources: Submit name of imported materials source.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Aggregate Storage, General:
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 MATERIALS

A. Base Rock:

B. Open Graded Base Rock : 2 inch to 3/4 inch, Angular crushed washed stone; free of shale, clay, friable material and debris.

C. Choker Course: 3/4 inch to 1/4 inch, Angular crushed washed stone; free of shale, clay, friable material and debris.

D. Compacted Aggregate Base
   1. Aggregates shall consiste of uniform quality, clean, tough, durable fragments of rock or gravel, free from flat, elongated, soft or disintegrating pieces, and other objectionable matter occuring either free or as a coating on the stone.
   2. Graded in accordance with ASTM C136/C136M, within the following limits:
      a. 2 inch sieve: 100 percent passing.
      b. 1 1/2 inch sieve: 95 percent passing.
      c. 3/4 inch sieve: 60 to 80 percent passing.
      d. 1/4 inch sieve: 35 to 40 percent passing.
      e. No. 200: 0 to 5 percent passing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.02 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

A. Under all Asphalt and Concrete Paving and Curbs:
   1. Compact to 95 percent of maximum dry density.

B. Place aggregate in maximum 4 inch layers and roller compact to specified density.

C. Level and contour surfaces to elevations and gradients indicated.

D. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

E. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

3.05 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 321216
ASPHALT PAVING

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 311123 - Aggregate Base Courses

B. Section 321313 - Concrete Paving: Concrete curbs.

C. Section 321723 - Pavement Markings.

1.02 REFERENCE STANDARDS

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil–Aggregate Subbase, Base, and Surface Courses; 2017 (Reapproved 2021).

B. AI MS-2 - Asphalt Mix Design Methods; 2015.

C. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.

1.03 QUALITY ASSURANCE

A. Perform Work in accordance with Oregon Department of Transportation standards.

B. Mixing Plant: Complying with Oregon Department of Transportation standards.

C. Obtain materials from same source throughout.

1.04 FIELD CONDITIONS

A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

B. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Cement: ASTM D946.

B. Aggregate for Pervious Asphalt Base Course: In accordance with Oregon Department of Transportation Dense Graded Mix..

C. Aggregate for Standard Asphalt Binder Course: In accordance with Oregon Department of Transportation Dense Graded Mix..

D. Aggregate for Pervious Asphalt Binder Course: In accordance with Oregon Department of Transportation Open Graded Graded Mix Design.

E. Aggregate for Standad Asphalt Wearing Course: to meet requirements for Oregon Department of Transportation Dense Graded Mix Design.

F. Aggregate for Pervious Asphalt Wearing Course: [to meet requirements for Oregon Department of Transportation Open Graded Mix Design].

2.02 ASPHALT PAVING MIXES AND MIX DESIGN

A. Use dry material to avoid foaming. Mix uniformly.

B. Standard Asphalt Base Course: 3.0 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.

C. Pervious Asphalt Wearing Course: 5 to 7 percent of asphalt cement by weight in mixture in accordance with AI MS-2 and Oregon Department of Transportation Open-Mix Design.

PART 3 EXECUTION - NOT USED

3.01 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.02 AGGREGATE BASE COURSE

A. Place and compact aggregate base courses.

B. See Section 321120.

3.03 PREPARATION - PRIMER

A. Apply primer in accordance with manufacturer's instructions.

B. Apply primer on aggregate base or subbase at uniform rate of 1/3 gal/sq yd.

C. Use clean sand to blot excess primer.

3.04 PREPARATION - TACK COAT

A. Apply tack coat in accordance with manufacturer's instructions.

B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 1/3 gal/sq yd.

3.05 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within 24 hours of applying primer or tack coat.

B. Place asphalt wearing course within two hours of placing and compacting binder course.

C. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

D. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.06 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.

C. Variation from True Elevation: Within 1/2 inch.

3.07 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for quality control.

END OF SECTION

SECTION 321313
CONCRETE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete curbs, v-channels, paving, and slabs.

1.02 RELATED REQUIREMENTS

A. Section 032000 - Concrete Reinforcing.

B. Section 311123 - Aggregate Base Courses

C. Section 321216 - Asphalt Paving: Asphalt wearing course.

1.03 REFERENCE STANDARDS

A. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.

B. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

C. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.

D. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

F. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.

G. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2023.

H. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2024.

I. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.

J. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

K. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).

L. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2023, with Editorial Revision.

M. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.

N. ASTM D1752 - Standard Specification for Preformed Sponge Rubber, Cork, and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2018 (Reapproved 2023).

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on joint filler, admixtures, and curing compound.

PART 2 PRODUCTS

2.01 FORM MATERIALS

A. Wood form material, profiled to suit conditions.

B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
   1. Product:

2.02 REINFORCEMENT

A. Reinforcing Steel and Welded Wire Reinforcement: Types specified in Section 032000.

B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) yield strength; deformed billet steel bars; unfinished.

2.03 CONCRETE MATERIALS

A. Obtain cementitious materials from same source throughout.

B. Cement: ASTM C150/C150M, Normal - Type I Portland cement, gray color.

C. Fine and Coarse Mix Aggregates: ASTM C33/C33M.

D. Fly Ash: ASTM C618, Class C or F.

E. Water: Clean, and not detrimental to concrete.

F. Air-Entraining Admixtures: ASTM C260/C260M.

G. Chemical Admixtures: ASTM C494/C494M, Type A - Water Reducing, Type C - Accelerating, and Type G - Water Reducing, High Range and Retarding.

2.04 ACCESSORIES

A. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

2.05 CONCRETE MIX DESIGN

A. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended by manufacturer.

B. Concrete Properties:
   1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; 3500 psi.
   2. Water-Cement Ratio: Maximum 40 percent by weight.
   3. Maximum Slump: 4 inches.

2.06 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.02 SUBBASE

A. See Section 321123 for construction of base course for work of this Section.

3.03 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

3.04 FORMING

A. Place and secure forms to correct location, dimension, profile, and gradient.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.05 REINFORCEMENT

A. Place reinforcement as indicated.

B. Place dowels to achieve pavement and curb alignment as detailed.

3.06 COLD AND HOT WEATHER CONCRETING

A. Follow recommendations of ACI PRC-305 when concreting during hot weather.

B. Follow recommendations of ACI PRC-306 when concreting during cold weather.

C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

3.07 PLACING CONCRETE

A. Place concrete in accordance with ACI PRC-304.

B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

3.08 JOINTS

A. Align curb, gutter, and sidewalk joints.

B. Place 3/8 inch wide expansion joints at 20 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.

1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.

C. Provide scored joints along curbs.

1. At 4 feet intervals.

D. Provide expansion joints at 12 feet intervals along curbs.

3.09 FINISHING

A. Area Paving: Light broom, texture perpendicular to pavement direction.

B. Curbs and Gutters: Light broom, texture parallel to pavement direction.

3.10 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

3.11 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Do not permit pedestrian traffic over pavement until 75 percent design strength of concrete has been achieved.

END OF SECTION

SECTION 321500
AGGREGATE SURFACING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Crushed stone surfacing.

B. Geosynthetic surface reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 312200 - Grading: Preparation of subbase.

B. Section 312316 - Excavation.

C. Section 329219 - Seeding.

1.03 REFERENCE STANDARDS

A. ASTM D1603 - Standard Test Method for Carbon Black Content in Olefin Plastics; 2020.

B. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Geosynthetic Product Data: Indicate recycled content, ultraviolet stability, and compressive strength.

C. Manufacturer's qualification statement.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. See Section 016000 - Product Requirements for additional requirements.

B. Identify, store, and handle geosynthetics according to ASTM D4873/D4873M.

C. Protect geosynthetic materials from sunlight and other ultraviolet light sources during storage.

D. Handle geosynthetics with care and prevent dragging, dropping, or imbalanced lifting.

1.07 FIELD CONDITIONS

A. Follow recommendations of geosynthetic manufacturer.

B. Surface Requirements: Do not place geosynthetic when the receiving surface is saturated or has ponded water.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pathway Base Course: 3/4" - #10 stone; free of shale, clay, friable material, and debris.

B. Pathway Surfacing: Pit run, washed, 1/4"-0" stone; free of shale, clay, friable material, and debris.

C. Geosynthetic Surface Reinforcement: Recurring pattern, interlocking, capable of retaining fill.
   1. Material: High density polyethylene.
   2. Carbon Black: 1 percent, minimum, when tested in accordance with ASTM D1603.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subgrade has been prepared correctly, is smooth, and is at proper grade and level.

B. Do not begin work until subgrade is correct.

3.02 INSTALLATION

A. Install surface reinforcement smooth and without overlaps or wrinkles.
   1. Cut sections to shape with applicable tools.
   2. Interlock sections at adjacent joints.
   3. Anchor sections to base course.

B. Place aggregate base course, see Section 321123 and per drawings.

END OF SECTION

SECTION 321723
PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Painted pavement markings.

1.02 RELATED REQUIREMENTS

A. Section 321216 - Asphalt Paving.

B. Section 323300 - Site Furnishings

1.03 REFERENCE STANDARDS

A. AASHTO M 237 - Standard Specification for Epoxy Resin Adhesives for Bonding Traffic Markers to Hardened Portland Cement and Asphalt Concrete; 2005 (Reapproved 2019).

B. AASHTO M 247 - Standard Specification for Glass Beads Used in Pavement Markings; 2013 (Reapproved 2018).

C. AASHTO M 249 - Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form); 2012 (Reapproved 2020).

D. AASHTO MP 24 - Standard Specification for Waterborne White and Yellow Traffic Paints; 2015 (Reapproved 2020).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work of this section with adjoining work.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

1.07 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.08 SEQUENCING

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of markings.

PART 2 PRODUCTS

2.01 PAINTED PAVEMENT MARKINGS

A. Painted Pavement Markings: As indicated on drawings.
   1. Marking Paint: In accordance with AASHTO MP 24.
      a. Parking Lots: White.
      b. Wheelchair Symbols: Provide blue and white.
   2. Obliterating Paint: Type I, in accordance with AASHTO MP 24.
      a. Bituminous Pavement: Black.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify existing markings for removal.

B. Verification of Conditions: Verify that pavement is dry and ready for installation.

C. Notify Landscape Architect of unsatisfactory conditions before proceeding.

3.02 PREPARATION

A. Place barricades, warning signs, and flags as necessary to alert approaching traffic.

B. Clean surfaces prior to installation.
   1. Remove dust, dirt, and other debris.

C. Apply paint stencils by type and color at necessary intervals.

3.03 INSTALLATION

A. General:
   1. Position pavement markings as indicated on drawings.
   2. Field location adjustments require approval of Landscape Architect.

B. Painted Pavement Markings:
   1. Apply in accordance with manufacturer's instructions.
   2. Obliterating Paint: Apply as necessary to cover existing markings completely.
   3. Marking Paint: Apply uniformly, with sharp edges.
      a. Applications: One coat.
      b. Wet Film Thickness: 0.015 inch, minimum.
      c. Stencils: Lay flat against pavement, align with striping, remove after application.

3.04 TOLERANCES

A. Maximum Variation From True Position: 3 inches (76 mm).

B. Maximum Offset From True Alignment: 3 inches (76 mm).

3.05 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Allow the pavement marking to set at least the minimum time recommended by manufacturer.

3.06 CLOSEOUT ACTIVITIES

A. See Section 017800 - Closeout Submittals for additional requirements.

3.07 PROTECTION

A. Prevent approaching traffic from crossing newly applied pavement markings.

B. Replace damaged or removed markings at no additional cost to Project Owner.

END OF SECTION

SECTION 321816.13
PLAYGROUND PROTECTIVE SURFACING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Protective surfacing for playground area.

1.02 RELATED REQUIREMENTS

A. Section 116813 - Playground Equipment: Playground layout (staking).

B. Section 311123 - Aggregate Base Courses

C. Section 321313 - Concrete Paving: Subbase for resilient surfacing.

1.03 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 D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine; 2017.

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

D. ASTM F1487 - Standard Consumer Safety Performance Specification for Playground Equipment for Public Use; 2021.

E. CPSC Pub. No. 325 - Public Playground Safety Handbook; 2015.

1.04 DEFINITIONS

A. Use Zone: The area beneath and immediately adjacent to a play structure or equipment (play event) that is designated for unrestricted circulation around equipment, and on whose surface it is predicted that a user would land when falling from or exiting the equipment.

B. Critical Fall Height: The maximum fall height at which the protective surfacing meets the requirements of ASTM F1292.

C. High Play Activity Area: Areas where the fall height is especially great, such as at swings. A high play activity area is defined only where the protective surfacing of the entire playground area is not designed for the greatest fall height. High play activity areas are defined on the drawings.

D. Fall Height: The vertical distance between the finished elevation of the designated play surface and the finished elevation of the protective surfacing beneath it as defined by ASTM F1487.

E. Protective Surfacing: Resilient ground surfacing. The characteristics of the protective surfacing are based on the fall height of the playground equipment. Changes in either the surfacing or the fall height, particularly reducing the resilience of the protective surfacing or increasing the fall height, will reduce safety-related performance.

F. Subbase: A layer under the resilient layer of the protective surfacing but over the subgrade; may be rigid, as in concrete or bituminous, or aggregate.

G. Subgrade: The surface of the ground on which the protective surfacing is installed.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements - Administrative Requirements, for submittal procedures.

B. Product Data: For all manufactured surfacing products, provide manufacturer's product data showing materials of construction, compliance with specified standards, installation procedures, and safety limitations.
   1. Include IPEMA certifications where required.

C. Shop Drawings: Detailed scale drawings showing locations of existing playground equipment and exposed footings, bases, and anchorage points.
   1. Clearly identify footing and base elevations in relation to a fixed survey point on site and to subgrade elevation and depth of protective surfacing, surveyed by land surveyor licensed in the State in which the Project is located.
   2. Show locations of underground utilities, storm-drainage system and irrigation system.
   3. Show locations of related construction such as walkways and roadways, fences, site furnishings, and plantings.
   4. Show measured fall height for each playground equipment item, determined in accordance with ASTM F1487.
   5. Show Use Zone perimeters, determined in accordance with ASTM F1487.

1.06 QUALITY ASSURANCE

A. Maintain one copy of the latest edition of ASTM F1487 and CPSC Pub. No. 325 at project site.

B. Installer Qualifications: Company certified by manufacturer for training and experience installing the protective surfacing; provide installer's company name and address, and training and experience certificate.

1.07 PRE-INSTALLATION MEETING

A. Coordinate with Section 116813.

B. Convene a meeting one week before starting earthwork for playground to discuss coordination between various installers.
   1. Require attendance by personnel responsible for grading and installers of playground equipment, protective surfacing, footings, and adjacent work.
   2. Include representatives of Contractor.
   3. Notify Landscape Architect at least 2 weeks prior to meeting.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store protective surfacing to project site in accordance with manufacturer's recommendations.

B. Store materials in a dry, covered area, elevated above grade.

1.09 WARRANTY

A. See Section 017800 - Closeout Submittals - Closeout Submittals, for additional warranty requirements.

B. Provide manufactures warranty for playground surfacing.

PART 2 PRODUCTS

2.01 PERFORMANCE CRITERIA

A. Because the safety of the playground depends on strict compliance with the performance criteria, this information is provided for Contractor's information.
   1. The top elevation of the protective surfacing is intended to be flush with adjacent grades.
   2. Use Zone: The protective surfacing has been designed to provide acceptable impact attenuation as defined in ASTM F1292 for Critical Height of 10 feet.

2.02 MATERIALS

A. Poured-In-Place Membrane Surfacing: Weather-resistant wear layer over impact attenuating substrate over rigid subbase.
   1. Wear Layer: Ethylene propylene diene monomer (EPDM) particles adhered with a ultraviolet-stabilized polyurethane binder to produce an even, uniformly colored surface.
   2. Wear Layer Thickness: 3/8 inch, minimum.
   3. Coefficient of Friction, when wet: 0.8, minimum, when tested in accordance with ASTM D2047.
   4. Wear Layer Color(s): To match existing playground surfacing..

5. Impact Attenuating Substrate: 100 percent recycled shredded styrene butadiene rubber (SBR) shreds or granules with 100 percent solids polyurethane binder to form a resilient material; do not use foam rubber.
6. Resilient Depth - High Play Activity Area: 4 inches, maximum.
7. Certification: Provide IPEMA certification of ASTM F1292 Critical Fall Height at thickness specified.
8. Manufacturers:
    a. GameTime, Inc: www.gametime.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

B. Poured-In-Place Membrane Surfacing: Weather-resistant wear layer over rigid subbase.
1. Wear Layer: Ethylene propylene diene monomer (EPDM) particles adhered with a ultraviolet-stabilized polyurethane binder to produce an even, uniformly colored surface.
2. Wear Layer Thickness: 3/8 inch, minimum.
3. Coefficient of Friction, when wet: 0.8, minimum, when tested in accordance with ASTM D2047.
4. Wear Layer Color(s): As indicated on drawings.

C. Engineered Wood Fiber Fill: Manufactured for the purpose of protective surfacing; complying with ASTM F2075; do not use mulch manufactured from recycled pallets, or lumber containing nails or metal fasteners.
1. Depth: As required to achieve specified Critical Fall Height as defined in ASTM F1292 but not more than depth indicated; maintain top elevation flush with adjacent grades.
2. Depth - High Play Activity Area: 18 inches.
3. Certification: Provide IPEMA certification of ASTM F1292 Critical Fall Height at thickness specified.
4. Manufacturers:
    a. GameTime, Inc: www.gametime.com/#sle.

D. Geotextile: Nonwoven polypropylene sheet.

E. Aggregate Subbase: See Section 321120.

PART 3 EXECUTION

3.01 EXAMINATION

A. Playground equipment installer will perform playground layout prior to installation of footings; verify correctness of layout before starting this work.

B. Verify that playground equipment and site furnishings and irrigation system located within playground area are complete.

C. Verify location of underground utilities and facilities in the playground area. Damage to underground utilities and facilities will be repaired at Contractor's expense.

D. Verify that subgrades are at proper elevations and that smooth grading is complete.

E. Verify that proper depth of surfacing is marked on base supports of playground equipment.

3.02 PREPARATION

A. Correct subgrade irregularities to ensure that required depth of protective surfacing can be installed, and subgrade elevation is in accordance with manufacturer's requirements.

B. Inside Use Zones remove all obstructions that would extend into the resilient protective surfacing.

C. Remove rocks, debris, and other similar items.

3.03 SUBBASE

A. Install aggregate subbase as indicated on drawings and in Section 321123. Compact aggregate to maximum 95 percent, in accordance with ASTM D1557.

B. Install concrete subbase as indicated on drawings.

1. Remove curing compounds and other substances that will adversely affect adhesion.

C. Install with top surface of subbase no higher than grades and levels indicated and not more than 1/4 inch lower than grades and levels indicated.

D. Install in true, even plane, sloped to provide positive drainage.

E. Flatness Tolerance: 1/4 inch in 10 feet, maximum.

F. Cure subbase at least 7 days but not less than required by manufacturer of resilient surfacing.

3.04 RESILIENT SURFACING LAYER

A. Install in accordance with CPSC Pub. No. 325, ASTM F1487, manufacturer's instructions, and requirements of authorities having jurisdiction (AHJ).

B. Install proper thickness throughout Use Zone(s).

C. Clean and dry surface of subbase.

D. Poured In Place Surfacing:
   1. Mix components mechanically on-site in accordance with manufacturer's directions; do not mix by hand.
   2. Install seamlessly; ensure complete bond to subbase.
   3. Cover footings and foundations and adhere tightly around penetrating elements.
   4. Maintain full thickness of resilient layers within Use Zone; cover or abut containment curbs as indicated on drawings; completely cover tapered transition edges.
   5. Hand trowel exposed surface to smooth, even finish.
   6. Impact Attenuation Layer: Install entire layer in one continuous pour on the same day.
   7. Wear Surface: Bond wear surface to substrate with adhesive. Apply adhesive in small quantities so that wear surface can be applied before adhesive dries.
      a. Install surfacing seamlessly. When wear surface is composed of different color patterns, pour surface continuously and seamlessly.
      b. When seams are required due to color change or field conditions, place adjacent wear surface as soon as possible, before initial pour has cured. Coat edge of initial pour with adhesive and apply wear surface mixture immediately.
      c. Add a minimum of 1/16 inch depth to specified surfacing depth to ensure required impact attenuation performance is met.
      d. Install wear surface to cover foundations and adhere tightly around elements penetrating the surface.

3.05 LOOSE FILL SURFACING

A. Install in accordance with CPSC Pub. No. 325, ASTM F1487, and requirements of authorities having jurisdiction (AHJ).

B. Cover Subgrade with Geotextile:
   1. Lap minimum 4 inches width at seams. Adhere seams in accordance with manufacturer's recommendations.
   2. Install smooth, and free of tensile stresses, folds, or wrinkles.
   3. Protect from clogging, tears, or other damage during surfacing installation.
   4. Repair or replace damaged geotextile in accordance with manufacturer's recommendations.

C. Install loose fill to depths indicated, with smooth even surface flush with tops of containment curbs.

3.06 FIELD QUALITY CONTROL

A. Landscape Architect will inspect playground surfacing after installation to verify that surfacing is of proper type and depth and that playground meets specified design safety and accessibility requirements.

B. Repair or replace rejected work until compliance is achieved.

3.07 CLEANING AND PROTECTION

A. Restore adjacent existing areas that have been damaged from the construction.

B. Clean playground equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation. Clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer.

C. Clean playground area of excess construction materials, debris, and waste.

D. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction.

E. Protect installed products until Date of Substantial Completion.

F. Replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 323300
SITE FURNISHINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wheel Stops

B. Picnic Tables

C. Benches

D. Bollards

E. Seating Boulders

1.02 RELATED REQUIREMENTS

A. Section 321313 - Concrete Paving, for concrete footings.

B. Section 055000 - Metal Fabrications: Anchors to attach site furnishings to mounting surfaces.

C. Section 055000 - Metal Fabrications: Ball stop fencing

D. Section 312316 - Excavation: Seating Boulders

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, and maintenance information.

C. Seating Boulders:
   1. Provide photos of proposed boulders including scale for reference.
   2. Indicate source and type of stone.

1.05 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 WHEEL STOPS

A. Wheel Stops: Black with yellow markings, solid, integrally colored, 96 percent recycled HDPE or commingled postconsumer and postindustrial recycled plastic or recycled rubber; UV stabilized; 4 inches (100 mm) high by 6 inches (150 mm) wide by 72 inches (1800 mm) long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.

B. Contractor furnished, contractor installed.
   1. Installation Method: As indicated on plans.

2.02 BENCH

A. Gametime Leaf Bench: Model Number T103S

B. Colors: Blue seats with yellow frame.

C. Installation per manufacturer instructions
   1. Hardware: Stainless steel.

2.03 PICNIC TABLE

A. Gametime Tuffclad Series #28014

B. Colors: Blue tabletop with yellow seats

C. ADA Accessible

D. Install per manufacturer instructions

2.04 LOG BENCH

A. Per drawings and specification sections 055000 Metal Fabrications and 061000 Rough Carpentry.

2.05 SEATING BOLDERS

A. Material: Naturally weathered or split stone, suitable for informal seating.

B. Stone Type: Mollala stone or approved equal

C. Size: as shown on drawings.

D. Shape: Natural form with generally flat or gently sloped top surface.

E. Finish: Natural; top surface may be smoothed or honed as needed.

F. Color: Regionally appropriate tones consistent with design intent.

G. Selection Criteria: Free of sharp edges, unstable points, or cracking.

H. Quantity as shown on drawings.

I. Performance Requirements:
   1. Seating boulders shall be safe for use by children and comply with applicable school district safety guidelines.
   2. Boulders shall not present fall hazards, entrapment risks, or sharp projections.
   3. Edges and surfaces shall be stable, non-slip, and free of sharp or jagged features.
   4. All exposed surfaces shall be smooth to the touch, with no sharp points or edges.
   5. No loose or unstable rock fragments.
   6. Rounded or softened edges preferred.
   7. Stones with fissures, spalls, or flakes that could detach over time are not acceptable.
   8. Top surfaces shall provide stable, non-slip seating.

2.06 BOLLARDS

A. Steel Pipe Bollards: Hollow steel pipe with plain shaft.
   1. Materials:Steel Pipe: ASTM A53/A53M, standard weight.
   2. Factory Finish: Powder coated black.

B. Install as per manufacturer's instructions and in locations inidcated on drawings.
   1. Materials:
      a. Steel Pipe: ASTM A53/A53M, standard weight.
      b. Factory Finish: Powder coated black.
   2. Mounting: In-ground.
   3. Products:
      a. Evergreen Hatchworks Removable Bollard: https://evergreenhatchworks.com/bollard-posts/.

2.07 INLET GRATE

A. Neenah 6500 grate or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify proper installation of mounting surfaces, preinstalled anchor bolts, and other mounting devices; and ready to receive site furnishing items.

B. Do not begin installation until unacceptable conditions are corrected.

3.02 INSTALLATION

A. Install site furnishings in accordance with approved shop drawings, and manufacturer's installation instructions.

B. Provide level mounting surfaces for site furnishing items.

C. Install site furnishings level, plumb, true, and securely anchored at locations indicated in Drawings.

D. Ball Stop Fencing: Verify that posts are set plumb at correct height and spacing. Brace posts in position during placement and finishing operations until concrete is sufficiently cured.

E. Seating Boulders:
   1. Install one for review and approval by Landscape Architect prior to full installation.
   2. Excavate and prepare subgrade to receive boulder.
   3. Seat boulders with a minimum of 1/3 mass buried below finish grade for stability.
   4. Orient top surface for comfort and use.
   5. Backfill and tamp soil or paving around base for integrated appearance.
   6. Verify with Landscape Architect that boulder orientation and placement are age-appropriate and accessible. Adjust final position as directed by Landscape Architect.
   7. Inspect each boulder post-installation for sharp edges or instability; grind or adjust as needed.

3.03 CLEANING

A. Inspect completed installations and their components.

B. Remove spots, dirt, and debris.

C. Repair damaged finishes to match original finish or replace damaged component.

D. Replace or re-set any boulders dislodged or damaged during construction.

END OF SECTION

SECTION 328426
DESIGN BUILD IRRIGATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe and fittings, valves, sprinkler heads, and accessories.

B. Control system.

C. Design Build Requirements

1.02 RELATED REQUIREMENTS

A. Section 31 01 90 Operation and Maintenance of Planting

B. Section 32 93 00 - Planting: For information regarding soil preparation and installation of plants

1.03 REFERENCE STANDARDS

1. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2020.
2. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with site backfilling, landscape grading and delivery of plant life.

1.05 DESIGN BUILD REQUIREMENTS

A. Design build system shall provide drip irrigation to trees identified on plans.

B. Drawing Requirements : Submitted plan shall meet the following criteria and shall be approved for construction only upon verification that all required criteria have been met.

C. Drawings submitted for design approval:
   1. Must clearly illustrate irrigation heads, dripline, valve, controller and point of connection locations. Individual valves and controllers shall be numbered sequentially. The size and maximum flow through each valve and capacity of each controller shall be clearly noted.
   2. Must clearly illustrate pipe sizes from all laterals and mainline pipe.
   3. Drawings must be to a standard measurable engineering scale that is at a minimum of 1”=30'-0”.
   4. Drawings must be CAD generated.
   5. Drawings must include a legend that describes all symbols and materials represented on the plan.
   6. Drawings must clearly illustrate that the proposed irrigation system meets all performance criteria described by these specifications.
   7. Must utilize graphics that clearly distinguish between lateral and mainline pipe and sleeves under pavement; dripline; manual or automatic control valves, isolation valves and drain valves; irrigation controllers and all other equipment located on the plan.

D. Irrigation system as designed and installed shall perform within the tolerances and specification of the specified manufacturers.

E. The system shall be fully adjustable to fine-tune the system performance for specific zones. Indicate water pressure and gallonage parameters at available water source on the required submittal.

F. Irrigation system shall be designed so that planting beds, sloped banks and lawn zones are on separate control valves to facilitate the different water requirements of each area.

G. System shall be designed to supply manufacturer's specified minimum operating pressure to furthest emitter from water meter. Water flow through piping shall not exceed a velocity of 5 feet per second.

H. System shall furnish components to allow operation within manufacturer's specified tolerances for optimum performance. Undersized components shall not be approved for installation.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: See Design Build Criteria and Requirements. Submit design-build irrigation plan to Landscape Architect for review and approval.

C. Product Data: Provide component and control system and wiring diagrams.

D. As-Built Drawings: Record actual locations of all concealed components piping system.

E. Operation and Maintenance Data:
   1. Provide instructions for operation and maintenance of system and controls, seasonal activation and shutdown, and manufacturer's parts catalog.
   2. Provide schedule indicating length of time each valve is required to be open to provide a determined amount of water.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience.

1.08 REGULATORY REQUIREMENTS

A. Conform to applicable code for piping and component requirements.

1.09 COORDINATION

A. Coordinate the work with site backfilling, landscape grading and delivery of plant life.

B. Installer's Field Services: Prepare and start systems under provisions fo Section 01 70 00 Execution and Closeout Requirements and Section 32 01 90 Operation and Maintenance of Planting.

1.10 EXTRA MATERIALS

A. See Section 01 60 00 - Product Requirements, for additional provisions.

B. Extra Valve Keys for Manual Valves: Two.

C. Extra Valve Box Keys: Two.

D. Extra Valve Marker Keys: Two.

PART 2 PRODUCTS

2.01 IRRIGATION SYSTEM

A. Electric solenoid controlled underground irrigation system, with pressure blow-out drain.

B. Manufacturers:
   1. Rain Bird Sales, Inc: www.rainbird.com.
   2. Hunter Irrigation. www.Hunter.com
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PIPE MATERIALS

A. PVC Pipe: ASTM D2241; Schedule 40 pipe.

B. Fittings: Type and style of connection to match pipe.

C. Swing Joints: LASCO schedule 80 three way assembly

D. Pipe Risers at Valves: 160 psi PVC pipe.

E. Solvent Cement: ASTM D2564 for PVC pipe and fittings.

F. Sleeve Material: PVC Schedule 40.

2.03 OUTLETS

A. Manufacturers:
   1. Rainbird.
   2. Hunter.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Outlets: Brass construction.

C. Root Zone Watering: 18", basket weave polyethelyne canister with pre-installed bubbler and check valve; swing assembly. 2 per tree.

D. Quick Coupler: Rainbird 44k with swivel head. With LEEMCO LS120 atttached to restrict movement. Owner to approve locations.

2.04 VALVES

A. Manufacturers: As indicated on drawings.
   1. Hunter; ICZ Drip Control Zone Kit
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Ball Valves: Provide 3/4” ball valve vents and drains for winterizing system in accessible valve boxes.

C. Backflow Preventers: double check
   1. Watts 007 or 009. As approved by local authoritiesWilkins 950 XL or equal. As approved by local authorities.

D. Manual drain valves shall be the non-lubricated type, capable of sealing in either flow direction, with true union end connections and lever type operator. PVC ball valves shall be constructed using a PVC body and ball, Teflon seats and FPM o-rings.

E. Valve Box and Cover: Rainbird Jumbo VB-JMB designed for an interlocking 'two-box' system constructed thermoplastic, black body with green T-top overlapping lid, cover all holes in the boxes to eliminate soil from entering the boxes.

F. Valve Box and Cover at quick couplers: Rainbird VB series 10" round.

G. Valve Box and Cover at drain valve: 4" dia. PVC, schedule 40, white, length as required with 'snug cap' or other sealing cover..

2.05 CONTROLS

A. Manufacturers: As indicated on drawings.
   1. Hunter; NODE battery operated controller
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Controller shall be a battery operated, waterproof controller sized to operate number of valves in control box.

2.06 OTHER MATERIALS

A. Drain Rock: Washed, round river pea gravel, no fines.

B. Trench Backfill: Mason's sand and excavated soil, or as shown on drawings.

C. Tracing Wire: Yellow, insulated copper wire; size: AWG #12.

D. Valve Keys: 36" long with tee handle and key end to fit manual valves.

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

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify location of existing utilities.

B. Verify that required utilities are available, in proper location, and ready for use.

C. Determine water supply, pressure and flow characteristics. Report results of pressure test at POC prior to commencing.

3.02 PREPARATION

A. Piping layout indicated is diagrammatic only. Route piping to avoid plants, ground cover, and structures.

B. Layout and stake locations of system components.

C. Review layout requirements with other affected work. Coordinate locations of sleeves under paving to accommodate system.

D. Provide protection for system at all times. Keep rock, gravel, debris, and all other foreign materials from entering piping, valves and other equipment.

E. Provide barriers, crossings, markers and other devices necessary to protect materials and pedestrians at open trenches, holes, stockpiles, etc.

3.03 TRENCHING

A. Trench and backfill in accordance with Section 31 2316 and Section .

B. Trench Size:
   1. Minimum Width: 4 inches.
   2. Minimum Cover Over Installed Supply Piping: 18 inches.
   3. Minimum Cover Over Installed Supply Piping under paving: 24 inches.
   4. Minimum Cover Over Installed Branch Piping: 12 inches.
   5. Minimum Cover Over Installed Outlet Piping: 12 inches.

C. Trench to accommodate grade changes .

D. Maintain trenches free of debris, material, or obstructions that may damage pipe.

3.04 INSTALLATION

A. Install pipe, valves, controls, and outlets in accordance with manufacturer's instructions.

B. Connect to utilities.

C. Set outlets and box covers at finish grade elevations.

D. Provide for thermal movement of components in system.

E. Install sleeves in all locations whre mainline and lateral piping and/or control wiring pass under paved areas and curbs or through walls. Extend sleeve 12 inches beyond edge of paving, curb, or wall.

F. After piping is installed, but before outlets are installed and backfilling commences, open valves and flush system with full head of water.

3.05 CONTROLLERS

A. Install as shown on details and per Manufacturer's written instructions and recommendations.

3.06 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 4000.

B. Prior to backfilling, test system for leakage at main piping to maintain 100 psi pressure for one hour.

C. System is acceptable if no leakage or loss of pressure occurs during test period.

3.07 BACKFILLING

A. Provide 3 inch sand cover over piping.

B. Backfill remainder with native soil. Remove all rock greater than inch from backfill material.

C. Backfill trench and compact to specified subgrade elevation. Protect piping from displacement.

3.08 SYSTEM STARTUP

A. Prepare and start system in accordance with manufacturer's instructions.

B. Adjust control system to achieve time cycles required.

C. Adjust head types for full water coverage as directed.

3.09 CLOSEOUT ACTIVITIES

A. Instruct Owner's personnel in operation and maintenance of system, including adjusting of sprinkler heads. Use operation and maintenance data as basis for demonstration.

3.10 MAINTENANCE

A. See Section 017000-Execution and Closeout Requirements, for additional requirements relating to maintenance service.

B. Provide a separate maintenance contract for specified maintenance service.Provide one complete spring start-up and a fall shutdown by installer, at no extra cost to Project Owner.

C. Provide one complete spring start-up and a fall shutdown by installer, at no extra cost to Project Owner.

3.11 WARRANTY

A. Contractor shall warrant the irrigation system to be free of defects in materials and workmanship for a period of one (1) year from the date of Final Acceptance. Any defects arising within the warranty period shall be corrected at no cost to the Owner.

END OF SECTION

SECTION 329113
SOIL PREPARATION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes topsoil and soil preparation of completed rough grading, including the following:
   1. Soil materials.
   2. Testing of soil materials.
   3. Preparation for planting areas.
   4. Soil amendments, fertilizers and mulches.

B. Related Sections:
   1. Section 31 1000: Site Clearing
   2. Section 31 2000: Grading
   3. Section 32 9300: Plants

1.02 DEFINTIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

C. Finish Grade: Elevation of finished surface of planting soil.

D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

E. 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.

F. 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.

G. Planting Area: Areas to be planted.

H. 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 perhaps fertilizers to produce a soil mixture best for plant growth.

I. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

J. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

K. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

L. 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.

M. 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.

N. Compost: Organic, nutrient rich humus made from recycled and decomposed lawn, garden trimmings, and leaf debris.

1.03 SUBMITTALS

A. Submit certified analysis of imported topsoil from a qualified soil testing laboratory 20 working days prior to use on site. The report to contain the following:
   1. Percentages of organic matter; gradation of sand, silt, and clay content; action exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
   2. Suitability of tested soil for plant growth.
   3. Based upon the test results, the laboratory soil analysis is to include recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. (92.9 sq. m) or volume per cu. yd. (0.76 cu. m) for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
   4. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

B. Available Testing Laboratories; An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed:
   1. Soil and Plant Laboratory, Inc. – www.soilandplantlaboratory.com
   2. Western Agricultural Laboratories – www.al-labs-west.com

C. Where tests of imported topsoil show results that fail to conform to required standards, include with the report a recommended treatment plan to bring the material into conformance.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:
   1. Deliver commercial fertilizer in original containers with labels indicating weight, chemical analysis and name of manufacturer.

B. Storage and Protection:
   1. Store fertilizers and lime in dry place, free from intrusion of moisture, and protected from contamination by herbicides.
   2. Protect soil and compost materials from deterioration by surface moisture erosion, freezing temperatures, and chemical contamination during storage and handling.

1.05 PROJECT CONDITIONS

A. Set limits of work areas for vehicles and equipment to minimize soil compaction in planting areas.

B. Stockpile topsoil on-site no higher than 4 feet.

C. Provide protective covers and barriers to prevent damage and staining to existing site improvements.

D. Prepare topsoil only when weather and soil conditions allow. Do not attempt soil preparation work when weather or soil conditions would contribute to poor or improper mixing, voids, or other adverse conditions.

1.06 SEQUENCING AND SCHEDULING

A. Coordinate soil preparation work with installation of other site improvements and planting of trees, shrubs and ground covers.

PART 2 PRODUCTS

2.01 PLANTING SOILS – GENERAL

A. Planting Soil for Planting Areas; Import planting soil complying with the following:
   1. Imported Blended Soil Mixture of Topsoil and Compost so that organic material content at levels between 2-6 percent; free of stone 1-1/2 inches or larger in any dimension and other extraneous materials harmful to plant growth, with a pH Range between 5.5 and 7.

B. Topsoil Textural Class Requirements: Textural analysis within the following gradations:
   1. % of Total Weight Average %

Sand (0.05-2.0mm dia.)	45-75	60
Silt (0.002-0.05mm dia.)	15-35	25
Clay (less than 0.002mm dia.)	05-20	15

C. Additional Properties of Imported Topsoil or Manufactured Topsoil:
   1. Screened and free of stones 1 inch or larger in any dimension.
   2. Free of roots, plants, sod, clods, clay lumps, pockets of coarse sand, paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials harmful to plant growth.
   3. Free of weeds and invasive plants including but not limited to:
      a. Cirsium arvense (Canadian Thistle)
      b. Convolvulus spp. (Morning Glory)
      c. Cyperus esculenturs (Yellow Nutsedge)
      d. Cytisus scoparus (Scotch Broom)
      e. Dipsacus sylvestris (Common Teasel)
      f. Equisetum (Horsetail)
      g. Festuca arundinaceae (Tall Fescue)
      h. Hedera helix (English Ivy)
      i. Holcus canatus (Velvet Grass)
      j. Lolium spp. (Rye Grasses)
      k. Lotus corniculatus (Bird's Foot Trefoil)
      l. Lythrium salicaria (Purple Loose Strife)
      m. Melilotus spp. (Sweet Clover)
      n. Myriophyllum spicatum (Eurasian Milfoil)
      o. Phalaris arundinaceae (Reed Canary Grass)
      p. Rubus discolor (Himalayan Blackberry)
      q. Solanum spp. (Nightshade)
      r. Trifolium spp. (Clovers)
   4. Not infested with parasitic nematodes, grubs, other pests, pest eggs, or other undesirable organisms and disease-causing plant pathogens; friable and with sufficient structure to give good tilth and aeration.
   5. Soil shall have a field capacity of at least 15 percent on a dry weight basis.

2.02 STORMWATER FACILITY PLANTING SOIL

A. General Composition - The material shall be a mix of sand and compost, blended by volume consisting of 60-70% sand and 30-40% compost (by volume) per the City of Portland Stormwater Management Manual.
   1. Analysis Requirements - A particle gradation analysis of the blended material, including compost, shall be conducted in conformance with ASTM C117/C136 (AASHTO T11/T27) or ASTM D422/D1140.
      a. The analysis shall include the following sieve sizes: 1 inch, 3/8 inch, #4, #10, #20, #40, #60, #100, #200. The gradation of the blend shall meet the following gradation criteria:

Sieve Size	Percent Passing
1 inch	100
# 4	75-100
# 10	40-100
# 40	15-50

# 100	5-25
# 200	5-15

b. The blend shall have a coefficient of Uniformity (D60/D10) equal or greater than 6 to ensure it is well graded (has a broad range of particle sizes). The coefficient is the ratio of two particle diameters on a grain-size distribution curve; it is the particle diameter at 60% passing divided by the particle diameter at 10% passing.
c. The pH (Power of Hydrogen) of the blended material shall be tested and be between 6 to 8.

2. General Requirements for the Blended Material:
   a. The material shall be loose and friable.
   b. It shall be well mixed and homogenous.
   c. It shall be free of wood pieces, plastic, and other foreign matter.
   d. It shall have no visible water

2.03 COMPOST

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4 inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   1. Organic Matter Content: 50 to 60 percent of dry weight.
   2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.04 FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 10 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: 1 lb/1000 Sq. Ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

E. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
   1. Size: 10-gram tablets.
   2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.05 PRE-EMERGENT HERBICIDE

A. Pre-emergent Herbicide: As directed for condition by currently licensed herbicide applicator.

2.06 POST-EMERGENT HERBICIDE

A. Post-emergent Herbicide: As directed for condition by currently licensed herbicide applicator.

2.07 WATER

A. Water: Suitable for irrigation, free from oil, acid, alkali, salt or other substances harmful to plant life.

2.08 EQUIPMENT

A. Fertilizer Spreading Equipment:
   1. Power Operated Spreaders: Rotary or drop distribution equipment.
   2. Manual Operated Spreaders: Hand operated distribution equipment.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the site for conditions that will adversely affect execution, permanence and quality of work, and survival of plant materials. Verify rough graded surfaces are free of:
   1. Concrete, asphalt, and other construction debris.
   2. Limbs, twigs, cones, seed-pods and other woody material.
   3. Rock, gravel or other material not suitable for plant growth.

B. Verify that rough grades and slopes of areas to be planted areas are set at sufficient depth to allow for placement of specified materials. If the site is not suitable for landscaping operations, perform necessary corrective work.

3.02 GENERAL PREPARATION OF GROUND SURFACES – ALL PLANTING AREAS

A. Eliminate uneven areas and low spots, and remove lumber, stones, sticks, mortar, concrete, rubbish, debris, contaminated soil and any other material harmful to plant life, in shrub and ground cover beds.

B. Verify that invasive species and weeds have been eliminated prior to the placement of topsoil. Do not place topsoil until all living weed matter has been eliminated.
   1. Weed eradication includes herbicide and non-herbicide methods.
   2. Eradication includes, but is not limited to, elimination of the following invasive species and weeds:
      a. Cirsium arvense (Canadian Thistle)
      b. Convolvulus spp. (Morning Glory)
      c. Cyperus esculenturs (Yellow Nutsedge)
      d. Cytisus scoparus (Scotch Broom)
      e. Dipsacus sylvestris (Common Teasel)
      f. Equisetum (Horsetail)
      g. Festuca arundinaceae (Tall Fescue)
      h. Hedera helix (English Ivy)
      i. Holcus canatus (Velvet Grass)
      j. Lolium spp. (Rye Grasses)
      k. Lotus corniculatus (Bird's Foot Trefoil)
      l. Lythrium salicaria (Purple Loose Strife)
      m. Melilotus spp. (Sweet Clover)
      n. Myriophyllum spicatum (Eurasian Milfoil)
      o. Phalaris arundinaceae (Reed Canary Grass)
      p. Rubus discolor (Himalayan Blackberry)
      q. Solanum spp. (Nightshade)
      r. Trifolium spp. (Clovers)

3. Apply herbicide by manual 'spot spraying', wicking, or backpack methods according to manufacturer's specifications.
4. Apply herbicide as directed by a currently licensed applicator, strictly applied by manufacturer's specifications and applicable codes and regulations, and in accordance with Owner's Integrated Pest Management (IPM) process.
5. Remove invasive plant material after herbicide application has effectively stopped plant growth. Dispose legally off-site.
6. After initial spraying and removal of weeds, and prior to placing topsoil, water the subgrade sufficiently to germinate dormant weed seeds.
    a. Prior the weed crop producing seeds, spray weeds with herbicide and remove them from site.
    b. Before continuing with topsoil placement, verify with the Owner whether or not to repeat this treatment.
7. Use selective hand removal by non-herbicide methods if herbicide application threatens existing plantings.
8. Replace immediately existing or new plantings damaged or killed by herbicide application at no additional cost to the Owner.

3.03 PLACING PLANTING SOILS

A. Place planting soils in minimum depths of 12 inches in planting areas.

B. Verify that planting soil is stockpiled in sufficient quantities to be placed at depths specified.

C. Place planting soil at specified grades between existing or constructed points on the site, such as curbs, walls, walks and paving.

3.04 SOIL PREPARATION IN PLANTING BEDS

A. Loosen subgrade of planting beds to a minimum depth of 12 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
    1. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend with loosened subgrade.
        a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
        b. Mix lime with dry soil before mixing fertilizer.
        c. Spread planting soil mix to a depth of 6 inches. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
        d. Spread approximately 1/2 the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 6 inches of subgrade. Spread remainder of planting soil mix.

B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.05 ADJUSTING, CLEANING, AND PROTECTION

A. Restore prepared areas to specified condition where eroded, settled, or compacted after mixing of soil amendments and fine grading.

B. Keep adjacent pavement, curb, and walking surfaces clean and work area in an orderly condition.
    1. Provide protective cover and barriers as necessary to prevent damage and staining.

C. Keep project site free from accumulation of debris, topsoil, and other material.

D. At completion of each area of work, completely remove debris, equipment and surplus materials.

E. Clean paved area or surfaces stained or soiled from landscaping materials with a power sweeper using water under pressure. Wash building surfaces with proper equipment and materials as approved by the Owner.

3.06 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION 329219
SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation of subsoil.

B. Placing topsoil.

1.02 RELATED REQUIREMENTS

A. Section 312200 - Grading.

B. Section 329113- Soil Preparation.

C. Section 329300 - Plants.

1.03 DEFINITIONS

A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Certificate: Certify seed mixture approval by authority having jurisdiction.

1.05 DELIVERY, STORAGE, AND HANDLING

A. 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.

PART 2 PRODUCTS

2.01 SEED MIXTURE

A. Seed Mixture:
   1. Sunmark Seeds DOT MULTIPURPOSE or approved equal.

2.02 ACCESSORIES

A. Fertilizer: Recommended for grass, slow release nitrogen, biological materials, and biostimulant materials; of proportion necessary to eliminate deficiencies of topsoil.

B. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 PREPARATION

A. Prepare subgrade in accordance with Section 312200.

B. Place topsoil in accordance with Section 329113.

3.03 FERTILIZING

A. Apply fertilizer in accordance with manufacturer's instructions.

B. Apply 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.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

3.04 SEEDING

A. Apply seed at a rate of 8 lbs per 1000 sq ft evenly in two intersecting directions. Rake in lightly.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Do not sow immediately following rain, when ground is too dry, or during windy periods.

D. Immediately following seeding and compacting, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.

E. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

F. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.05 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

3.06 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

3.07 PROTECTION

A. Identify seeded areas with stakes and string around area periphery. Set string height to 36 inches. Space stakes at 96 inches.

END OF SECTION

SECTION 329300
PLANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation of subsoil.

B. Topsoil bedding.

C. New trees, plants, and ground cover.

D. Mulch and Fertilizer.

1.02 RELATED REQUIREMENTS

A. Section 320190 - Operation and Maintenance of Planting: Post-occupancy maintenance.

B. Section 329119 - Landscape Grading: Topsoil placement and finish grading.

1.03 REFERENCE STANDARDS

A. ANSI/AHIA Z60.1 - American National Standard for Nursery Stock; 2014.

B. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.

1.04 FIELD CONDITIONS

A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.

1.05 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide one year warranty.

C. Warranty: Include coverage for one continuous growing season; replace dead or unhealthy plants.

D. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

PART 2 PRODUCTS

2.01 PLANTS

A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work.

2.02 SOIL MATERIALS

A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 5.4 and maximum 7.0.

2.03 SOIL AMENDMENT MATERIALS

A. Fertilizer: Containing fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated in analysis.

2.04 MULCH MATERIALS

A. Mulching Material: Hemlock species wood shavings, free of growth or germination inhibiting ingredients.

2.05 ACCESSORIES

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared subsoil and planters are ready to receive work.

B. Saturate soil with water to test drainage.

3.02 PREPARATION OF SUBSOIL

A. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.

C. Scarify subsoil to a depth of 3 inches where plants are to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.

D. Dig pits and beds 6 inches larger than plant root system.

3.03 PLACING TOPSOIL

A. Spread topsoil to a minimum depth of 4 inches over area to be planted. Rake smooth.

B. Place topsoil during dry weather and on dry unfrozen subgrade.

C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.

D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.

E. Install topsoil into pits and beds intended for plant root balls, to a minimum thickness of 6 inches.

3.04 PLANTING

A. Place plants for best appearance.

B. Set plants vertical.

C. Set plants in pits or beds, partly filled with prepared plant mix, at a minimum depth of 6 inches under each plant. Remove burlap, ropes, and wires, from the root ball.

D. Saturate soil with water when the pit or bed is half full of topsoil and again when full.

3.05 FIELD QUALITY CONTROL

A. Plants will be rejected if a ball of earth surrounding roots has been disturbed or damaged prior to or during planting.

3.06 MAINTENANCE

A. See Section 320190 - Operation and Maintenance of Planting for post-occupancy maintenance.

B. Provide maintenance at no extra cost to Project Owner; Project Owner will pay for water.

C. See Section 017000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

D. Provide a separate maintenance contract for specified maintenance service.

E. Maintain plant life for 12 months after Date of Substantial Completion.

F. Maintain plant life immediately after placement and until plants are well established and exhibit a vigorous growing condition. Continue maintenance until termination of warranty period.

G. Irrigate sufficiently to saturate root system and prevent soil from drying out.

H. Cultivate and weed plant beds and tree pits.

I. Remove dead or broken branches and treat pruned areas or other wounds.

J. Neatly trim plants where necessary.

K. Immediately remove clippings after trimming.

L. Control growth of weeds. Apply herbicides in accordance with Portland Public School regulations.

M. Control insect damage and disease. Apply pesticides in accordance with manufacturers instructions.

N. Remedy damage from use of herbicides and pesticides.

O. Replace mulch when deteriorated.

END OF SECTION