BEAVERTON SCHOOL DISTRICT

WEST TUALATIN VIEW SEWER REPLACEMENT

PROJECT MANUAL

03/15/2021 – 100% CONSTRUCTION DOCUMENTS

OWNER:

Beaverton School District
16550 SW Merlo Rd.
Beaverton, OR 97003

PREPARED BY:

KCL Engineering
312 NW 10th Ave.
Portland, OR 97209

SECTION 00 01 03 - PROJECT DIRECTORY

PART 1 GENERAL

1.1 SECTION INCLUDES

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

1.2 OWNER:

A. Name: Beaverton School District.

1. Address Line 1: 16550 SW Merlo Road.
2. City: Beaverton.
3. State: Oregon.
4. Zip Code: 97003.
5. Telephone: (503) 356-4500.

B. Primary Contact: All correspondence from the Contractor to the Engineer will be direct, with copies to this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.

1. Title: Senior Project Manager.
2. Name: Jeffrey Hamman.
3. Email: Jeffrey_Hamman@beaverton.k12.or.us.

1.3 CONSULTANTS:

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

1. Company Name: KCL Engineering.
    a. Address Line 1: 312 NW 10th Avenue.
    b. City: Portland.
    c. State: Oregon.
    d. Zip Code: 97209.
    e. Telephone: 971-400-0416.
2. Primary Contact:
    a. Title: Senior Mechanical Engineer.
    b. Name: Stormy L. Shanks, PE.

c. Email: sshanks@kclengineering.com.

B. Architectural Consultant:

1. Company Name: Oh Planning and Design, Architecture.

a. Address Line 1: 115 NW 1st Ave.

b. City: Portland.

c. State: Oregon.

d. Zip Code: 97209.

e. Telephone: (503) 280-8000.

2. Primary Contact:

a. Title: Associate.

b. Name: Caitlin McGehee, AIA, NCARB.

c. Email: caitlin.mcgehee@ohpd.net.

C. Civil Engineering Consultant:

1. Company Name: Harper Houf Peterson Righellis Inc..

a. Address Line 1: 530 Center Street NE.

b. Address Line 2: Suite 240.

c. City: Salem.

d. State: Oregon.

e. Zip Code: 97301.

f. Telephone: (503) 221-1131.

2. Primary Contact:

a. Title: Project Manager | Associate Principal.

b. Name: Beau Braman, PE.

c. Email: BeauB@hhpr.com.

D. Landscape Architecture Consultant:

1. Company Name: Harper Houf Peterson Righellis Inc..

a. Address Line 1: 205 SE Spokane Street.

b. City: Portland.

c. State: Oregon.

d. Zip Code: 97202.

e. Telephone: (503) 221-1131.

2. Primary Contact:

a. Title: Landscape Architect.

b. Name: Jeffery Creel, R.L.A..

c. Email: jeffc@hhpr.com.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 00 01 07 - SEALS PAGE

PART 1 GENERAL

1.1 ENGINEER OF RECORD:

A. Engineer: Design Professional of Record. Route all correspondence from the Contractor regarding construction documents authored by Engineer's consultants through the Engineer, unless otherwise agreed upon.

B. Company Name: KCL Engineering.

C. DATE:

D. SEAL:

EXPIRES: 6/30/2022

1.2 CONSULTANTS:

A. Architectural Consultant:

1. Company Name: Oh planning+design, architecture.

2. DATE:

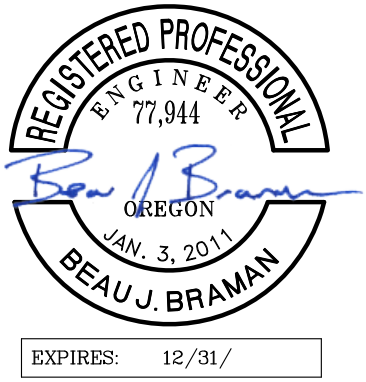
3. SEAL:

B. Civil Engineering Consultant:

1. Company Name: Harper Houf Peterson Righellis Inc.

2. DATE:

3. STAMP:



C. Landscape Architecture Consultant:

1. Company Name: Harper Houf Peterson Righellis Inc.

2. DATE: March 15, 2021

3. STAMP:

END OF SECTION

SECTION 00 01 10 - TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

1.1 DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS

SPECIFICATIONS

2.1 DIVISION 01 -- GENERAL REQUIREMENTS

2.2 DIVISION 02 -- EXISTING CONDITIONS

2.3 DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

2.4 DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

2.5 DIVISION 09 -- FINISHES

2.6 DIVISION 22 -- PLUMBING

2.7 DIVISION 31 – EARTHWORK

A. 31 10 00 – Site Clearing
B. 31 20 00 – Earth Moving
C. 31 23 17 – Trenching
D. 31 25 00 – Erosion and Sediment Control

2.8 DIVISION 32 -- EXTERIOR IMPROVEMENTS

A. 32 11 32 – Aggregate Base Courses
B. 32 12 16 – Asphalt Paving
C. 32 13 13 – Concrete Paving
D. 32 17 23 – Pavement Markings
E. 32 91 13 – Soil Preparation
F. 32 92 19 – Seeding
G. 32 94 45 – Landscape Maintenance

2.9 DIVISION 33 -- UTILITIES

A. 33 31 00 – Sanitary Sewer Piping
B. 33 39 00 – Sanitary Sewer Structures

2.10 UNASSIGNED SECTIONS

A. Asbestos Abatement Contractor Bid Document and Specifications

END OF SECTION

SECTION 01 10 00 - SUMMARY

PART 1 GENERAL

1.1 PROJECT

A. Project Name: West Tualatin View Sewer Replacement

B. Owner's Name: Beaverton School District.

C. Engineer's Name: KCL Engineering.

D. Additional Project contact information is specified in Section - 000103 - Project Directory.

1.2 DESCRIPTION OF ALTERATIONS WORK

A. Scope of demolition and removal work is indicated on drawings.

B. Scope of alterations work is indicated on drawings.

C. Plumbing: Selectively replace existing system with new construction as indicated on drawings..

1.3 OWNER OCCUPANCY

A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.

B. Owner intends to occupy the Project upon Substantial Completion.

C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

D. Schedule the Work to accommodate Owner occupancy.

1.4 CONTRACTOR USE OF SITE

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

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

B. Arrange use of site and premises to allow:

1. Use of site by the public.

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

1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.

2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Utility Outages and Shutdown:

1. Limit disruption of utility services to hours the building is unoccupied.

2. Do not disrupt or shut down life safety systems, including but not limited to fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.

3. Prevent accidental disruption of utility services to other facilities.

END OF SECTION

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.2 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.

1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.

a. Unavailability.

b. Regulatory changes.

2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.

2. Agrees to provide the same warranty for the substitution as for the specified product.

3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.

4. Waives claims for additional costs or time extension that may subsequently become apparent.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

1. Note explicitly any non-compliant characteristics.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.

1. Forms included in the Project Manual are adequate for this purpose, and must be used.

D. Limit each request to a single proposed substitution item.

3.2 RESOLUTION

3.3 ACCEPTANCE

END OF SECTION

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General administrative requirements.

B. Electronic document submittal service.

C. Preconstruction meeting.

D. Site mobilization meeting.

E. Progress meetings.

F. Construction progress schedule.

G. Progress photographs.

H. Number of copies of submittals.

I. Requests for Interpretation (RFI) procedures.

J. Submittal procedures.

1.2 RELATED REQUIREMENTS

A. Section 01 60 00 - Product Requirements: General product requirements.

1.3 REFERENCE STANDARDS

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

1.4 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Engineer:

1. Requests for Interpretation (RFI).
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Manufacturer's instructions and field reports.
6. Applications for payment and change order requests.
7. Progress schedules.
8. Correction Punch List and Final Correction Punch List for Substantial Completion.

9. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format, as appropriate to the document, and transmitted via eBuilder, an Internet-based submittal service that receives, logs and stores documents and notifies addressees via email.

1. Contractor and Engineer are required to use this service for the following processes:

a. Submission of shop drawings and other submittals and receiving the processed submittals.

b. Submission of Requests for Information (RFI) and receiving RFI responses from the Owner and Engineer.

c. Submission of invoices and approval or rejection of same.

d. Distribution of meeting minutes.

e. Submission of as-built record drawings.

f. Submission of test results and Operation and Maintenance (O&M) manuals (electronic format).

g. Submission of Change Orders (COs) and contract amendment and approval or rejection of same.

h. Transmission of formal letters and notices between the District and the Contractor.

2. It is Contractor's responsibility to submit documents in allowable format.

3. Subcontractors, suppliers, and Engineer's consultants will be permitted to use the service at no extra charge.

4. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.

5. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.

6. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Cost: The cost of the service will be paid by Owner.

C. Training: Owner will provide one, one-hour, web-based training session for all participants. Further training is the responsibility of the user of the service.

3.2 PRECONSTRUCTION MEETING

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

B. Attendance Required:

1. Owner.
2. Engineer.
3. Contractor.

C. Agenda:

1. Execution of 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. Submission of initial Submittal schedule.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.
8. Asbestos and hazardous material remediation. Reference "Asbestos Abatement Contractor Bid Document and Specifications"

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

3.3 SITE MOBILIZATION MEETING

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

B. Attendance Required:

1. Contractor.
2. Owner.
3. Engineer.
4. Contractor's superintendent.
5. Major subcontractors.

C. Agenda:

1. Use of premises by Owner and Contractor.

2. Owner's requirements.
3. Construction facilities and controls provided by Owner.
4. Temporary utilities provided by 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 Engineer, Owner, participants, and those affected by decisions made.

3.4 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum weekly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:

1. Contractor.
2. Owner.
3. Engineer.
4. Contractor's superintendent.
5. Major subcontractors.

D. 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. Review of RFIs log and status of responses.

7. Maintenance of progress schedule.

8. Corrective measures to regain projected schedules.

9. Planned progress during succeeding work period.

10. Maintenance of quality and work standards.

11. Effect of proposed changes on progress schedule and coordination.

12. Other business relating to work.

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

3.5 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

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

C. 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.

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

E. Submit updated schedule with each Application for Payment.

3.6 PROGRESS PHOTOGRAPHS

A. Submit new photographs at least once a month, within 3 days after being taken.

B. Photography Type: Digital; electronic files.

C. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Engineer.

D. In addition to periodic, recurring views, take photographs of each of the following events:

1. Excavations in progress.

2. Final completion, minimum of ten (10) photos.

E. Views:

1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.

2. Consult with Engineer for instructions on views required.

3. Provide factual presentation.

4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

F. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.

1. Delivery Medium: eBuilder.

2. File Naming: Include project identification, date and time of view, and view identification.

3.7 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. 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.

b. Do not forward requests which solely require internal coordination between subcontractors.

2. Prepare in eBuilder internet software.

3. Prepare using software provided by the Electronic Document Submittal Service.

4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

C. 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.

2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::

a. Approval of submittals (use procedures specified elsewhere in this section).

b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)

c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).

d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).

3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.

a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Engineer, and any of its consultants, due to processing of such RFIs.

D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.

1. Official Project name and number, and any additional required identifiers established in Contract Documents.

2. Owner's, Engineer's, and Contractor's names.

3. Discrete and consecutive RFI number, and descriptive subject/title.

4. Issue date, and requested reply date.

5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).

6. Annotations: Field dimensions and/or description of conditions which have engendered the request.

7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

F. RFI Log: RFI log is automatically built in the eBuilder software.

G. Review Time: Engineer 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.

1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.

1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.

2. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.

3. Notify Engineer within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.8 SUBMITTAL SCHEDULE

A. Submit to Engineer for review a schedule for submittals in tabular format.

1. Submit at the same time as the preliminary schedule specified in Section - 01 32 16 - Construction Progress Schedule.

2. Coordinate with Contractor's construction schedule and schedule of values.

3. Format schedule to allow tracking of status of submittals throughout duration of construction.

4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.

5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.

a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.9 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 Engineer 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 01 78 00 - Closeout Submittals.

3.10 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:

1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Engineer's knowledge as contract administrator or for Owner.

3.11 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 01 78 00 - Closeout Submittals:

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

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

3.12 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.

3.13 SUBMITTAL PROCEDURES

A. General Requirements:

1. Use a separate transmittal for each item.

2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.

3. Transmit on eBuilder, including approved form in the electronic submittal uploaded to eBuilder.

    a. Use Form CSI/CSC Form 12.1A.

4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.

5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.

    a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.

6. Schedule submittals to expedite the Project, and coordinate submission of related items.

    a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

    b. For sequential reviews involving Engineer's consultants, Owner, or another affected party, allow an additional 7 days.

    c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Engineer's approval, allow an additional 30 days.

7. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.

8. Provide space for Contractor and Engineer review stamps.

9. When revised for resubmission, identify all changes made since previous submission.

10. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.

11. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.

12. Submittals not requested will be recognized, and will be returned "Not Reviewed",

B. Product Data Procedures:

1. Submit only information required by individual specification sections.

2. Collect required information into a single submittal.

3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:

1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.

2. Do not reproduce Contract Documents to create shop drawings.

3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

3.14 SUBMITTAL REVIEW

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

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

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

D. Engineer's and consultants' 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.

2. Not Authorizing fabrication, delivery, and installation:

a. "Revise and Resubmit".

1) Resubmit revised item, with review notations acknowledged and incorporated.

b. "Rejected".

1) Submit item complying with requirements of Contract Documents.

E. Engineer's and consultants' 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 01 32 16 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preliminary schedule.

1.2 REFERENCE STANDARDS

1.3 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule.

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

C. 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.

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

E. Submit updated schedule with each Application for Payment.

F. Submit in electronic PDF format to eBuilder.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.2 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

END OF SECTION

SECTION 01 35 53 - SECURITY PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Security measures including personnel identification.

B. Background Screenings.

C. Covid-19 Procedures.

1.2 SECURITY PROGRAM

A. Protect Work , existing premises and Owner's operations from theft, vandalism, and unauthorized entry.

B. Initiate program in coordination with Owner's existing security system at project mobilization.

C. Maintain program throughout construction period until Owner acceptance precludes the need for Contractor security.

1.3 PERSONNEL IDENTIFICATION

A. All personnel under the employment of the Contractor and its Subcontractors that travel to, or spend time at the project site are to wear photo ID badges while on the work site. individuals not wearing badges will be removed from the project work site.

B. Badge To Include:

1. Individual's full name (no nicknames).

2. Individual's company affiliation.

3. Recent photograph of the individual, taken within the last 4 years.

C. Require return of badges at expiration of their employment on the Work.

1.4 BACKGROUND SCREENING

A. All personnel under the employment of the Contractor and its Subcontractors that spend time at the project site must complete a formal background screening by the Contractor and pass that screening review before being allowed on the work site. Background screening is to be done by a professional screening firm meeting the following qualifications:

1. Must have a minimum of five years of screening experience specifically for construction industry clients.

2. Must have a minimum of fifteen employees.

3. Must be able to provide access to an internet based screening management software system which has a feature to allow access by the District to view the pass-no pass result for each screened Contractor/Subcontractor employee working on a District project.

4. Must be accredited by the National Association of Professional Background Screeners (NAPBS).

B. Each individual will be screened for having committed any crime as listed in ORS 342.143, most recent edition.

1.5 COVID-19 PROCEDURES

A. All personnel under the employment of the Contractor and its Subcontractors that spend time at the project site must adhere to the Covid-19 infection prevention procedures of Beaverton School District, the State of Oregon, and Washington County.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Contractor's construction-related professional design services.

F. Control of installation.

G. Tolerances.

H. Defect Assessment.

1.2 REFERENCE STANDARDS

A. IAS AC89 - Accreditation Criteria for Testing Laboratories 2018.

1.3 DEFINITIONS

1.4 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations, pertaining to, but not limited to the following:

1. Temporary sheeting, shoring, or supports.

2. Temporary scaffolding.

3. Temporary bracing.

4. Temporary foundation underpinning.

5. Temporary stairs or steps required for construction access only.

1.5 SUBMITTALS

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

B. Designer's Qualification Statement: Submit for Engineer's knowledge as contract administrator, or for Owner's information.

1. Include information for each individual professional responsible for producing, or supervising production of, design-related professional services provided by Contractor.

a. Full name.

b. Professional licensure information.

c. Statement addressing extent and depth of experience specifically relevant to design of items assigned to Contractor.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Engineer and to Contractor.

1. Include:

a. Date issued.

b. Project title and number.

c. Name of inspector.

d. Date and time of sampling or inspection.

e. Identification of product and specifications section.

f. Location in the Project.

g. Type of test/inspection.

h. Date of test/inspection.

i. Results of test/inspection.

j. Compliance with Contract Documents.

k. When requested by Engineer, provide interpretation of results.

2. Test report submittals are for Engineer's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications:

1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

1.7 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.8 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 3 EXECUTION

2.1 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 Engineer 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.

2.2 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

2.3 TESTING AND INSPECTION

A. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.

2. Perform specified sampling and testing of products in accordance with specified standards.

3. Ascertain compliance of materials and mixes with requirements of Contract Documents.

4. Promptly notify Engineer and Contractor of observed irregularities or non-compliance of Work or products.

5. Perform additional tests and inspections required by Engineer.

6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.

2. Agency may not approve or accept any portion of the Work.

3. Agency may not assume any duties of Contractor.

4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:

1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.

2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.

3. Provide incidental labor and facilities:

a. To provide access to Work to be tested/inspected.

b. To obtain and handle samples at the site or at source of Products to be tested/inspected.

c. To facilitate tests/inspections.

d. To provide storage and curing of test samples.

4. Notify Engineer and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.

5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Engineer.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

2.4 DEFECT ASSESSMENT

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

B. If, in the opinion of Owner, it is not practical to remove and replace the work, Owner will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Dewatering

B. Temporary sanitary facilities.

C. Temporary Controls: Barriers, enclosures, and fencing.

D. Vehicular access and parking.

E. Waste removal facilities and services.

1.2 REFERENCE STANDARDS

1.3 DEWATERING

A. Provide temporary means and methods for dewatering all temporary facilities and controls.

B. Maintain temporary facilities in operable condition.

1.4 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.5 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.6 FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.7 SECURITY - SEE SECTION 01 35 53

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

B. Coordinate with Owner's security program.

1.8 VEHICULAR ACCESS AND PARKING

A. Coordinate access and haul routes with governing authorities and 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. Designated existing on-site roads may be used for construction traffic.

E. Existing parking areas may be used for construction parking.

1.9 WASTE REMOVAL

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

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

C. 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.

1.10 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.

D. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations.

1.2 RELATED REQUIREMENTS

A. Section 01 25 00 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

B. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

C. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.3 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.1 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is required.

2.2 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Use of products having any of the following characteristics is not permitted:

1. Containing lead, cadmium, or asbestos.

C. Where other criteria are met, Contractor shall give preference to products that:

1. If used on interior, have lower emissions, as defined in Section 01 61 16.

2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.

2.3 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications. Submit a request for substitution for any manufacturer not named.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.4 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.1 SUBSTITUTION LIMITATIONS

A. See Section 01 25 00 - Substitution Procedures.

3.2 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.3 STORAGE AND PROTECTION

A. Provide protection of stored materials and products against theft, casualty, or deterioration.

B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.

C. Store and protect products in accordance with manufacturers' instructions.

D. Store with seals and labels intact and legible.

E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

F. For exterior storage of fabricated products, place on sloped supports above ground.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

K. Prevent contact with material that may cause corrosion, discoloration, or staining.

L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Cutting and patching.

D. Cleaning and protection.

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

1.2 REFERENCE STANDARDS

1.3 SUBMITTALS

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

B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:

1. Structural integrity of any element of Project.

2. Integrity of weather exposed or moisture resistant element.

3. Efficiency, maintenance, or safety of any operational element.

4. Visual qualities of sight exposed elements.

5. Work of Owner or separate Contractor.

C. Closeout Submittal Log: Submit to owner on eBuilder within 30 days of start of contract.

D. Closeout Submittals: Submit only final, complete, and correct closeout documents by uploading to eBuilder.

1. Red-Lined As-Built Documents: Accurately record actual locations of capped and active utilities, supplemental instructions, change orders, and all as-built conditions that differ from the Construction Documents. Submit two hard copies to the owner in addition to uploading electronic version to eBuilder.

2. Operation and Maintenance Manual: Include all operation and maintenance information required in individual sections.

3. Warranties completed in the owner's name.

4. Permit Drawings

1.4 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

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

D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

1. Minimize amount of bare soil exposed at one time.

2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

G. 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.

H. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

I. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

J. 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.

1.5 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.1 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 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.

3.2 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.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 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.

3.4 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.

2. Report discrepancies to Engineer before disturbing existing installation.

3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Remove existing work as indicated and as required to accomplish new work.

1. Remove items indicated on drawings.

2. Relocate items indicated on drawings.

3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.

4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

C. Services (Including but not limited to Plumbing): Remove, relocate, and extend existing systems to accommodate new construction.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access

or provide access panel.

2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.

3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

   a. Disable existing systems only to make switchovers and connections; minimize duration of outages.

   b. Provide temporary connections as required to maintain existing systems in service.

4. Verify that abandoned services serve only abandoned facilities.

5. Remove abandoned pipe and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

D. Protect existing work to remain.

   1. Prevent movement of structure; provide shoring and bracing if necessary.

   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.

   3. Repair adjacent construction and finishes damaged during removal work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:

   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.

   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J. Do not begin new construction in alterations areas before demolition is complete.

K. Comply with all other applicable requirements of this section.

3.5 CUTTING AND PATCHING

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

B. See Alterations article above for additional requirements.

C. 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.

D. 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.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

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

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

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

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

J. 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. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.6 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 vacuum clean interior 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.

3.7 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. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

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

3.8 ADJUSTING

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

3.9 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

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

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

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

3.10 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

1. Provide hard copies to Owner and upload to eBuilder.

B. Accompany Engineer 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 Engineer when work is considered ready for Engineer'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 Engineer's Substantial Completion inspection.

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

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

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

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

END OF SECTION

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.1 WASTE MANAGEMENT REQUIREMENTS

A. 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. 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.

E. 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.

1.2 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.3 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.

1.4 SUBMITTALS

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

B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.

1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.

2. Submit Report on a form acceptable to Owner.

3. Landfill Disposal: Include the following information:

a. Identification of material.

b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.

c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.

d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

4. Incinerator Disposal: Include the following information:

a. Identification of material.

b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.

c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.

d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

5. Recycled and Salvaged Materials: Include the following information for each:

a. Identification of material, including those retrieved by installer for use on other projects.

b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.

c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.

d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.

e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

6. Material Reused on Project: Include the following information for each:

a. Identification of material and how it was used in the project.

b. Amount, in tons or cubic yards.

c. Include weight tickets as evidence of quantity.

7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 WASTE MANAGEMENT PROCEDURES

A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.2 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Engineer.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.

1. Provide containers as required.

2. Provide adequate space for pick-up and delivery and convenience to subcontractors.

3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

E. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

F. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

G. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

H. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 78 00 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout Submittal Log.

B. Contractor's Redlined As-Built Documents.

C. Operation and Maintenance Data.

D. Warranties and bonds.

1.2 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Individual Product Sections: Specific requirements for operation and maintenance data.

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

1.3 SUBMITTALS

A. Contractor's Redlined As-Built Documents: Submit documents to eBuilder with claim for final Application for Payment.

B. Closeout Submittal Log

C. Operation and Maintenance Data:

1. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.

2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.

3. Submit two sets of revised final documents in final form within 10 days after final inspection.

D. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with 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.

E. Stamped Authority Having Jurisdiction Permit Drawings: submit electronic documents to Engineer and Owner on eBuilder and two hard copies to owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. Submit only final, complete, and correct closeout materials by uploading to eBuilder. Do not submit drafts or versions of closeout materials for review.

3.2 CLOSEOUT SUBMITTAL LOG

A. A log listing the closeout deliverables in order of specification number.

B. Include a column in the log for each of the following: specification number, specifcation title, responsible contractor, product data, operation and maintenance data, shop drawings, warranty, and record documents.

3.3 CONTRACTOR'S REDLINED AS-BUILT DOCUMENTS

A. Maintain on site one set of the following red-lined as-built documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store red-lined as-built documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Changes made by Addenda and modifications.

F. Red-Lined As-Built Drawings: Legibly mark each item to record actual construction including:

1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
3. Field changes of dimension and detail.

4. Details not on original Contract drawings.

3.4 OPERATION AND MAINTENANCE DATA

A. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

B. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

C. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.5 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

1. Product data, with catalog number, size, composition, and color and texture designations.

2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.6 WARRANTIES AND BONDS

A. Obtain warranties and bonds, 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 Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of built site elements.

C. Selective demolition of building elements for alteration purposes.

D. Abandonment in place of existing utilities and utility structures.

1.02 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2019.

1.03 SUBMITTALS

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

B. Site Plan: Showing:
   1. Areas for temporary construction and field offices.

C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.

D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

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

B. Remove fences and gates.

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

D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 70 00.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   6. Do not close or obstruct roadways or sidewalks without permit.

7. 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.
8. 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 Owner.

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

E. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

H. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.

I. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Dismantle existing construction and separate materials.
2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

J. 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 before starting work and comply with their 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. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to 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 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.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
1. Verify that construction and utility arrangements are as indicated.
2. Report discrepancies to 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. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

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

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

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

B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 - 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 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Nonstructural dimension lumber framing.

C. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.

C. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).

D. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

E. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing; 2019a.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

G. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2015.

H. AWPA U1 - Use Category System: User Specification for Treated Wood; 2018.

I. PS 20 - American Softwood Lumber Standard; 2020.

J. WWPA G-5 - Western Lumber Grading Rules; 2017.

1.04 SUBMITTALS

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

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.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

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. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   3. 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.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Western Wood Products Association; WWPA G-5.

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: Kiln-dry or MC15.

D. Stud Framing (2 by 2 through 2 by 6 (50 by 50 mm through 50 by 150 mm)):
   1. Species: Douglas Fir-Larch.
   2. Grade: No. 2.

E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 STRUCTURAL COMPOSITE LUMBER

A. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.

2.04 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. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   3. Anchors: Toggle bolt type for anchorage to hollow masonry.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
   1. For contact with preservative treated wood in exposed locations, provide minimum G185 (Z550) galvanizing complying with ASTM A653/A653M.

C. Sill Gasket on Top of Foundation Wall: 1/4 inch (6 mm) thick, plate width, closed cell plastic foam from continuous rolls.

D. Construction Adhesives: Adhesives complying with ASTM C557 or ASTM D3498.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

PART 3 EXECUTION

3.01 PREPARATION

A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches (100 mm) and seal.

B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

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

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING 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. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.

E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

F. Provide the following specific nonstructural framing and blocking:
1. Cabinets and shelf supports.
2. Wall brackets.
3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Chalkboards and marker boards.
8. Wall paneling and trim.
9. Joints of rigid wall coverings that occur between studs.

3.05 TOLERANCES

A. Framing Members: 1/4 inch (6 mm) from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet (1 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

C. Variation from Plane, Other than Floors: 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

3.06 CLEANING

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

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

END OF SECTION

SECTION 06 20 00
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Wood casings and moldings.

1.02 RELATED REQUIREMENTS

A. Section 09 91 23 - Interior Painting: Painting of finish carpentry items.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

B. AWI (QCP) - Quality Certification Program; Current Edition.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2018).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2017, with Errata (2019).

E. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

F. PS 1 - Structural Plywood; 2009.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

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

B. Product Data:
   1. Provide manufacturer's product data, storage and handling instructions for factory-fabricated units.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   2. Include certification program label.

D. Samples: Submit one samples of Base and Back Panel, one-quarter full size, illustrating one-quarter finish and construction.

E. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Quality Certification:
   1. Provide labels or certificates indicating that the work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.07 MOCK-UP

A. Locate where directed.

B. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

B. Protect from moisture damage.

C. Handle materials and products to prevent damage to edges, ends, or surfaces.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Interior Woodwork Items:

1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.

2.02 SHEET MATERIALS

A. Softwood Plywood, Exposed to View: Face species as indicated, plain sawn, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

2.03 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Fasteners: Of size and type to suit application. _____ _____

C. Concealed Joint Fasteners: Threaded steel.

2.04 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Wood Filler: Solvent base, tinted to match surface finish color.

2.05 SITE FINISHING MATERIALS

A. Stain, Shellac, Varnish, and Finishing Materials: In compliance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.06 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.07 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.

3.03 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.

C. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

END OF SECTION

SECTION 09 05 61

COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Thin-set ceramic tile and stone tile.

B. Removal of existing floor coverings.

C. Preparation of existing concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Patching compound.

F. Remedial floor coatings.

1.02 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).

C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.

D. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2011.

1.03 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Product data for recommended remedial coating.
   7. Submit report to Architect.
   8. Submit report not more than two business days after conclusion of testing.

D. Adhesive Bond and Compatibility Test Report.

E. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.

F. Copy of RFCI (RWP).

1.04 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.

1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

D. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.
   2. Confirm date of start of testing at least 10 days prior to actual start.
   3. Allow at least 4 business days on site for testing agency activities.
   4. Achieve and maintain specified ambient conditions.
   5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

E. Floor Moisture Testing Technician Qualifications: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician Certification- Grade I.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.06 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F (18 degrees C) or more than 85 degrees F (30 degrees C).

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

B. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
   1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
   2. Use product recommended by testing agency.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:
   1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
      a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
      b. Removal of existing floor covering.
   2. Preliminary cleaning.

3. Moisture vapor emission tests; 3 tests in the first 1000 square feet (100 square meters) and one test in each additional 1000 square feet (100 square meters), unless otherwise indicated or required by flooring manufacturer.
4. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
5. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
6. Specified remediation, if required.
7. Patching, smoothing, and leveling, as required.
8. Other preparation specified.
9. Adhesive bond and compatibility test.
10. Protection.

C. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet (1.4 kg per 93 square meters) per 24 hours.

F. Report: Report the information required by the test method.

3.05 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.06 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.08 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.09 INSTALLATION OF REMEDIAL FLOOR SHEET MEMBRANE

A. Install in accordance with sheet membrane manufacturer's instructions.

3.10 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal channel ceiling framing.

B. Gypsum sheathing.

C. Cementitious backing board.

D. Gypsum wallboard.

E. Joint treatment and accessories.

F. Textured finish system.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS

A. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.

B. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).

C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017.

D. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2020).

E. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2020.

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2018.

G. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2019.

H. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2019.

I. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

J. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019, with Ediorial Revision (2020).

K. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

L. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

1.04 SUBMITTALS

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

B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

C. Product Data: Provide data on gypsum board, accessories, and joint finishing system.

D. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 5 years of experience.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.02 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
   4. USG Corporation: www.usg.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
   3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   4. Thickness:
   5. Paper-Faced Products:
      a. American Gypsum Company; LightRoc Gypsum Wallboard: www.americangypsum.com/#sle.
      b. American Gypsum Company; FireBloc Type X Gypsum Wallboard: www.americangypsum.com/#sle.
      c. CertainTeed Corporation; Type C Drywall: www.certainteed.com/#sle.
      d. CertainTeed Corporation; Type X Drywall: www.certainteed.com/#sle.
      e. Georgia-Pacific Gypsum; ToughRock: www.gpgypsum.com/#sle.
      f. Georgia-Pacific Gypsum; ToughRock Fireguard X: www.gpgypsum.com/#sle.
      g. USG Corporation; USG Sheetrock Brand EcoSmart Panels Firecode X: www.usg.com/#sle.
      h. USG Corporation; USG Sheetrock Brand Firecode X Panels: www.usg.com/#sle.
      i. Substitutions: See Section 01 60 00 - Product Requirements.
   6. Mold Resistant Paper Faced Products:
      a. American Gypsum Company; M-Bloc: www.americangypsum.com/#sle.
      b. CertainTeed Corporation; M2Tech 5/8" Type C Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
      c. Georgia-Pacific Gypsum; ToughRock Mold-Guard: www.gpgypsum.com/#sle.
      d. USG Corporation; USG Sheetrock Brand EcoSmart Panels Mold Tough Firecode X: www.usg.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.
   7. Glass Mat Faced Products:
      a. USG Corporation; USG Sheetrock Brand Glass-Mat Panels Mold Tough.

C. Backing Board For Wet Areas: One of the following products:
   1. Application: Surfaces behind tile in wet areas including tub and shower surrounds, shower ceilings, and kitchens.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
      a. Thickness: 1/2 inch (12.7 mm).
      b. Products:
         1) USG Corporation: www.usg.com/#sle.
         2) Substitutions: See Section 01 60 00 - Product Requirements.

D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings, unless otherwise indicated.
   2. Thickness: 1/2 inch (13 mm).
   3. Edges: Tapered.
   4. Products:
      a. CertainTeed Corporation; Interior Ceiling Drywall: www.certainteed.com/#sle.
      b. Georgia-Pacific Gypsum; ToughRock Span 24 Ceiling Board: www.gpgypsum.com/#sle.
      c. USG Corporation; 1/2 Inch Sheetrock Brand UltraLight Panels: www.usg.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 GYPSUM WALLBOARD ACCESSORIES

A. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
   1. Corner Beads: Low profile, for 90 degree outside corners.
      a. Products:
         1) CertainTeed Corporation; No-Coat Drywall Corner: www.certainteed.com/#sle.
         2) ClarkDietrich; Strait-Flex Big-Stick: www.clarkdietrich.com/#sle.
         3) Substitutions: See Section 01 60 00 - Product Requirements.
   2. Expansion Joints:
      a. Type: V-shaped PVC with tear away fins.

B. Decorative Metal Trim:
   1. Material: Extruded aluminum alloy 6063-T5 temper.
   2. Finish: Anodized, clear.
   3. Type: Profile as selected from manufacturer's standard range.

C. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

D. Finishing Compound: Surface coat and primer, takes the place of skim coating.

E. Textured Finish Materials: Latex-based compound; plain.

F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

G. Nails for Attachment to Wood Members: ASTM C514.

H. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Suspended Ceilings and Soffits: Space framing and furring members at 16 inches (400 mm) on center.
   1. Laterally brace entire suspension system.

B. Studs: Space studs at 16 inches on center (at 406 mm on center).
   1. Extend partition framing to structure in all locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.

C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

D. Blocking: Install wood blocking for support of:
   1. Framed openings.
   2. Wall-mounted cabinets.
   3. Plumbing fixtures.

3.03 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

E. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

F. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For nonrated assemblies, install as follows:
   1. Single-Layer Applications: Screw attachment.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
   1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
   2. At exterior soffits, not more than 30 feet (10 meters) apart in both directions.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

D. Decorative Trim: Install at locations shown on drawings and in accordance with manufacturer's instructions.

3.05 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.06 TEXTURE FINISH

A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

END OF SECTION

SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Ceramic accessories.

C. Ceramic trim.

D. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2019.

B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017.

C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2017.

D. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2016).

E. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship; 2019.

F. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).

G. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

H. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).

I. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).

J. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).

K. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017.

L. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.

M. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

N. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2016).

O. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2017.

P. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013 (Revised).

Q. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2010 (Reaffirmed 2016).

R. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2019.

S. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

T. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2019.

1.04 SUBMITTALS

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

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop Drawings: Indicate tile layout, perimeter conditions, junctions with dissimilar materials, thresholds, ceramic accessories, and setting details.

D. Samples: Mount tile and apply grout on one plywood panels, minimum 18 by 18 inches (457 by 457 mm) in size illustrating pattern, color variations, and grout joint size variations.

E. Installer's Qualification Statement:
   1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation.

F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Tile: 5 percent of each size, color, and surface finish combination.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

B. Installer Qualifications:
   1. Company specializing in performing tile installation, with minimum of five years of documented experience.

1.06 MOCK-UP

A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.

B. Construct tile mock-up where directed, incorporating all components specified for the location.
   1. Approved mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F (10 degrees C) and below 100 degrees F (38 degrees C) during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: All products by the same manufacturer.
   1. Dal-Tile Corporation: www.daltile.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Ceramic Mosaic Tile: ANSI A137.1, standard grade.
   1. Size: 1 by 1 inch (25 by 25 mm), nominal.
   2. Shape: Square.
   3. Surface Finish: To match existing.
   4. Color(s): To be selected by Architect from manufacturer's full range.
   5. Pattern: To match existing..
   6. Trim Units: Matching bead, cove, and surface bullnose shapes in sizes coordinated with field tile.
   7. Products:
      a. Dal-Tile Corporation: www.daltile.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 TRIM AND ACCESSORIES

A. Ceramic Accessories: Similar finish to match existing, same color and finish as adjacent field tile; same manufacturer as tile.

B. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.
   1. Manufacturers: Same as for tile.

C. Non-Ceramic Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Manufacturers:
      a. Schluter-Systems: www.schluter.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Thresholds: Aluminum 2 inches (51 mm) wide by full width of wall or frame opening; beveled edge on both long edges; without holes, cracks, or open seams.
   1. Applications:
      a. At doorways where tile terminates.

2.03 SETTING MATERIALS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers:
   1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
   2. LATICRETE International, Inc: www.laticrete.com/#sle.
   3. Merkrete, by Parex USA, Inc: www.merkrete.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
   1. Products:
      a. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.
      b. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers:
   1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
   2. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.
   3. Merkrete, by Parex USA, Inc; Merkrete Duracolor Non-Sanded Color Grout: www.merkrete.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
   1. Color(s): As selected by Architect from manufacturer's full line.

2. Products:
    a. ARDEX Engineered Cements; ARDEX WA: www.ardexamericas.com/#sle.
    b. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
    c. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

2.05 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
    1. Applications: Between tile and plumbing fixtures.
    2. Color(s): As selected by Architect from manufacturer's full line.
    3. Products:
        a. ARDEX Engineered Cements; ARDEX SX: www.ardexamericas.com/#sle.
        b. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
        c. Rust-Oleum Corporation; Merkrete Colored Caulking: www.rustoleum.com/#sle.
        d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
    1. Composition: Water-based colorless silicone.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
    1. Test in accordance with Section 09 05 61.
    2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
    3. Follow moisture and alkalinity remediation procedures in Section 09 05 61.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.19 , manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install ceramic accessories rigidly in prepared openings.

G. Install non-ceramic trim in accordance with manufacturer's instructions.

H. Install thresholds where indicated.

I. Sound tile after setting. Replace hollow sounding units.

J. Keep control and expansion joints free of mortar, grout, and adhesive.

K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

L. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

M. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - MORTAR BED METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F111, with cleavage membrane, unless otherwise indicated.

B. Cleavage Membrane: Lap edges and ends.

C. Waterproofing Membrane: Install as recommended by manufacturer .

D. Mortar Bed Thickness: 5/8 inch (15.9 mm), unless otherwise indicated.

3.05 CLEANING

A. Clean tile and grout surfaces.

3.06 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 09 51 53
DIRECT-APPLIED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Acoustic units.

B. Perimeter trim.

1.02 REFERENCE STANDARDS

A. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2016.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

C. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2019.

D. UL (FRD) - Fire Resistance Directory; Current Edition.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Install acoustic units after interior wet work is dry.

1.04 SUBMITTALS

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

B. Product Data: Provide data on acoustic units.

C. Shop Drawings: Indicate tile layout and related junctions with other work or ceiling finishes, interrelation of mechanical and electrical items related to system.

D. Samples: Submit two samples, 12 by 12 inch (304 by 304 mm) in size, illustrating material and finish of acoustic units.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

F. Manufacturer's Qualification Statement.

G. Installer's Qualification Statement.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed

1.05 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 type of work specified in this section with minimum five years of documented experience.

1.06 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Direct Applied Acoustical Ceilings:
   1. Armstrong World Industries, Inc: www.armstrong.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.

3. USG: www.usg.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Acoustic Tile: Mineral fiber, ASTM E1264 Type _____.
   1. Size: 12 by 12 inches (300 by 300 mm).
   2. Thickness: 3/4 inches (19 mm).
   3. Joint: To match existing.
   4. Edge: To match existing.
   5. Surface Color: White.
   6. Surface Finish: To match existing.

B. Adhesive: Waterproof, gun grade; type recommended by tile manufacturer.

C. Perimeter Moldings: Rolled steel profile, white color.

D. Acoustic Sealant for Perimeter Moldings: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION

A. Install system in accordance with manufacturer's instructions.

B. Perimeter Molding:
   1. Install edge molding at intersection of ceiling and vertical surfaces into bed of acoustic sealant.
   2. Use longest practical lengths.
   3. Where curved obstructions occur, provide preformed closures to match perimeter molding.

C. Locate tile on room axis according to reflected plan.

D. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.

E. Install acoustic units level in uniform plane.

END OF SECTION

SECTION 09 91 23
INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Surfaces inside cabinets.
   2. Prime surfaces to receive wall coverings.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

1.02 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

B. Regardless of the specular gloss name paint manufacturers give their products, provide specular gloss as measured on a 60° and 85° geometry Parallel?Beam Glossmeter per ASTM D523 and as defined by Master Painters Institute as follows:
   1. Gloss Level 1: Traditional matte finish; flat. Gloss at 60°: Maximum 5 units. Sheen at 85°: Maximum 10 units.
   2. Gloss Level 2: High side sheen flat; velvet-like finish. Gloss at 60°: Maximum 10 units. Sheen at 85°: 10 to 35 units.
   3. Gloss Level 3: Traditional eggshell-like finish. Gloss at 60°: 10 to 25 units. Sheen at 85°: 10 to 35 units.
   4. Gloss Level 4: Satin-like finish. Gloss at 60°: 20 to 35 units. Sheen at 85°: Minimum 35 units.
   5. Gloss Level 5: Traditional semi-gloss. Gloss at 60°: 35 to 70 units.
   6. Gloss Level 6: Traditional gloss. Gloss at 60°: 70 to 85 units.
   7. Gloss Level 7: High gloss. Gloss at 60°: More than 85 units.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.

C. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2005 (Reapproved 2017).

D. ASTM D4259 - Standard Practice for Preparation of Concrete by Abrasion Prior to Coating Application; 2018.

E. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

F. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

G. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

H. SSPC V1 (PM1) - Good Painting Practice: Painting Manual, Volume 1; 2016.

I. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

J. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS

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

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
   2. MPI product number (e.g., MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   4. Manufacturer's installation instructions.
   5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit two paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data including product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, and touch-up procedures.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color and type; from the same product run, store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience and approved by manufacturer.

1.06 MOCK-UP

A. Locate where directed by Architect.

B. Mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F (3 degrees C) above the dew point, or to damp or wet surfaces.

D. Minimum Application Temperatures for Paints: 50 degrees F (10 degrees C) for interiors unless required otherwise by manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
   1. If a single manufacturer cannot provide specified products; minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
   2. Substitution of MPI-approved products by a different manufacturer is preferred over substitution of unapproved products by the same manufacturer.

B. Paints:
   1. Rodda Paint Co: www.roddapaint.com/#sle.
   2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
   3. Miller Paint: www.millerpaint.com.

C. Primer Sealers: Same manufacturer as top coats.

D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Supply each paint material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:
   1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

C. Flammability: Comply with applicable code for surface burning characteristics.

D. Colors: As indicated on 09 06 00 Schedule of Finishes.

2.03 PAINT SYSTEMS - INTERIOR

A. Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, plaster, and drywall.
   1. Two top coats and one coat primer.

2. Top Coat(s): Interior Latex; MPI #52, MPI #53 (Concrete Only).
   a. Products:
      1) Rodda Master Painter Ultra Low VOC Flat, 513601. (MPI #53)
      2) Sherwin-Williams Harmony Interior Acrylic Latex, Flat. (MPI #53)
      3) Sherwin-Williams ProMar 200 HP Series, Eg-Shel. (MPI #52)
      4) Rodda Paint Lasyn, Eg-shell. (MPI #52).
      5) Substitutions: Section 01 60 00 - Product Requirements.
3. Top Coat Sheen:
   a. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces and Mechanical/Electrical Rooms.
   b. Velvet: MPI gloss level 2; use this sheen at Custodial Closets and Concrete.
   c. Eggshell: MPI gloss level 3; use this sheen at Classrooms, Offices, Corridor.
   d. Satin: MPI gloss level 4; use this sheen at Kitchen, Cafeteria, Restrooms.
4. Primer: As recommended by top coat manufacturer for specific substrate.
   a. Gypsum, Drywall, and Plaster: PVA
   b. Concrete: One coat high quality, acrylic latex primer.

B. Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:
1. Medium duty applications include doors, door frames, railings, handrails, guardrails, and balustrades.
2. Two top coats and one coat primer.
3. Top Coat(s): Interior Light Industrial Coating, Water Based; MPI #153.
   a. Products:
      1) Rodda Multi Master DTM Acrylic Semi-Gloss Enamel, 548901. (MPI #153)
      2) Sherwin-Williams Pro Industrial Acrylic Coating, Semi-Gloss. (MPI #153)
      3) Substitutions: Section 01 60 00 - Product Requirements.
4. Top Coat Sheen:
   a. Gloss: To match existing.
5. Primer: As recommended by top coat manufacturer for specific substrate.
   a. Interior Ferrous Metals: Red Oxide, Alkyd.
   b. Interior Non-Ferrous Metals: Vinyl wash primer.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
1. Gypsum Wallboard: 12 percent.
2. Plaster and Stucco: 12 percent.
3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.

4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Clean concrete according to ASTM D4258. Allow to dry.

F. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

G. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

H. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

I. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

J. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

K. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

D. Sand wood and metal surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 22 05 17 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe sleeves.

1.2 REFERENCE STANDARDS

A. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type) 2016.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).

PART 2 PRODUCTS

2.1 PIPE SLEEVES

A. Vertical Piping:

1. Sleeve Length: 1 inch above finished floor.

2. Provide sealant for watertight joint.

3. Blocked Out Floor Openings: Provide 1-1/2 inch angle set in silicon adhesive around opening.

4. Drilled Penetrations: Provide 1-1/2 inch angle ring or square set in silicone adhesive around penetration.

B. Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.

C. Pipe Passing Through Below Grade Exterior Walls:

1. Zinc coated or cast iron pipe.

2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.

D. Clearances:

1. Provide allowance for insulated piping.

2. Wall, Floor, Partitions: 1 inch greater than external; pipe diameter.

3. All Rated Openings: Caulked tight with fire stopping material complying with ASTM E814 in accordance with Section 07 84 00 to prevent the spread of fire, smoke, and gases.

PART 3 EXECUTION

3.1 INSTALLATION

A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

B. Install piping to conserve building space, to not interfere with use of space and other work.

C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

D. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.

1. Underground Piping: Caulk pipe sleeve watertight with lead and oakum or mechanically expandable chloroprene inserts with bitumen sealed metal components.

2. Aboveground Piping:

a. Pack solid using mineral fiber complying with ASTM C592.

b. Fill space with an elastomer caulk to a depth of 0.50 inch where penetrations occur between conditioned and unconditioned spaces.

E. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

END OF SECTION

SECTION 22 05 29 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Support and attachment components for equipment, piping, and other plumbing work.

1.2 REFERENCE STANDARDS

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

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.

D. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings 1999, with Editorial Revision (2018).

E. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.

F. MFMA-4 - Metal Framing Standards Publication 2004.

G. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018.

1.3 QUALITY ASSURANCE

A. Comply with Oregon Plumbing Specialty Code and Oregon Structural Specialty Code.

PART 2 PRODUCTS

2.1 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:

1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of plumbing work.

2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.

3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.

4. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.

5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.

    a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.

    b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Metal Channel (Strut) Framing Systems:

1. Manufacturers:

    a. Cooper B-Line, a division of Eaton Corporation.

    b. Thomas & Betts Corporation.

    c. Unistrut, a brand of Atkore International Inc.

    d. Substitutions: See Section 01 60 00 - Product Requirements.

2. Provide factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.

3. Comply with MFMA-4.

4. Channel Material:

    a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.

    b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.

5. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.

6. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.

C. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.

D. Pipe Supports:

1. Liquid Temperatures Up To 122 degrees F:

    a. Overhead Support: MSS SP-58 Types 1, 3 through 12.

    b. Support From Below: MSS SP-58 Types 35 through 38.

E. Pipe Stanchions: For pipe runs, use stanchions of same type and material where vertical adjustment is required for stationary pipe.

1. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.

2. Provide coated or plated saddles to isolate steel hangers from dissimilar metal tube or pipe.

F. Riser Clamps:

G. Offset Pipe Clamps: Double-leg design two-piece pipe clamp.

H. Strut Clamps: Two-piece pipe clamp.

I. Pipe Hangers: For a given pipe run, use hangers of the same type and material.

1. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.

2. Provide coated or plated hangers to isolate steel hangers from dissimilar metal tube or pipe.

J. Anchors and Fasteners:

1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.

3. Hollow Stud Walls: Use toggle bolts.

4. Wood: Use wood screws.

5. Plastic and lead anchors are not permitted.

6. Hammer-driven anchors and fasteners are not permitted.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.

C. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support system or ceiling grid.

D. Do not penetrate or otherwise notch or cut structural members.

E. Secure fasteners according to manufacturer's recommended torque settings.

F. Remove temporary supports.

END OF SECTION

SECTION 22 10 05 - PLUMBING PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe, pipe fittings, specialties, and connections for piping systems.

1. Sanitary sewer.
2. Domestic water.
3. Flanges, unions, and couplings.
4. Pipe hangers and supports.

1.2 REFERENCE STANDARDS

A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings 2018.

B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings 2018.

C. ASTM B32 - Standard Specification for Solder Metal 2020.

D. ASTM B88 - Standard Specification for Seamless Copper Water Tube 2020.

E. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric) 2020.

F. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube 2016.

G. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings 2016.

H. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings 2004 (Reapproved 2016).

I. ASTM D2661 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings 2014, with Editorial Revision (2018).

J. ASTM F876 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing 2020b.

K. ASTM F877 - Standard Specification for Crosslinked Polyethylene (PEX) Hot- and Cold-Water Distribution Systems 2020.

L. ASTM F1960 - Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing 2020.

M. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation 2018.

N. NSF 61 - Drinking Water System Components - Health Effects 2020.

O. NSF 372 - Drinking Water System Components - Lead Content 2020.

P. PPI TR-4 - PPI Listing of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB), and Minimum Required Strength (MRS) Ratings For Thermoplastic Piping Materials or Pipe 2017.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.2 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. ABS Pipe: ASTM D2661.

1. Fittings: ABS.

2. Joints: Solvent welded with ASTM D2235 cement.

2.3 SANITARY SEWER PIPING, ABOVE GRADE

A. ABS Pipe: ASTM D2661.

1. Fittings: ABS.

2. Joints: Solvent welded with ASTM D2235 cement.

2.4 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).

1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.

2. Joints: ASTM B32, alloy Sn95 solder.

B. Cross-Linked Polyethylene (PEX) Pipe: ASTM F876 or ASTM F877.

1. PPI TR-4 Pressure Design Basis:

a. 80 psig at maximum 200 degrees F.

2. Fittings: Brass and engineered polymer (EP) ASTM F1960.

3. Joints: ASTM F1960 cold-expansion fittings.

2.5 FLANGES, UNIONS, AND COUPLINGS

A. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.6 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.

1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.

2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.

3. Trapeze Hangers: Welded steel channel frames attached to structure.

4. Vertical Pipe Support: Steel riser clamp.

B. Plumbing Piping - Drain, Waste, and Vent:

1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.

2. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.

3. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.

4. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.

5. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

C. Plumbing Piping - Water:

1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.

2. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.

C. Sleeve pipes passing through partitions, walls and floors.

D. Pipe Hangers and Supports:

1. Support horizontal piping as indicated.

2. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

3. Place hangers within 12 inches of each horizontal elbow.

4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.

5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

6. Provide copper plated hangers and supports for copper piping.

E. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.4 TOLERANCES

A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

3.5 SCHEDULES

A. Pipe Hanger Spacing:

1. Metal Piping:

a. Pipe Size: 1/2 inches to 1-1/4 inches:

1) Maximum Hanger Spacing: 6.5 ft.

2) Hanger Rod Diameter: 3/8 inches.

b. Pipe Size: 1-1/2 inches to 2 inches:

1) Maximum Hanger Spacing: 10 ft.

2. Plastic Piping:

a. All Sizes:

1) Maximum Hanger Spacing: 6 ft.

2) Hanger Rod Diameter: 3/8 inch.

END OF SECTION

SECTION 22 10 06 - PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cleanouts.

1.2 REFERENCE STANDARDS

PART 2 PRODUCTS

2.1 CLEANOUTS

A. Cleanouts at Interior Unfinished Accessible Areas: Threaded type.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

SECTION 31 10 00 – SITE CLEARING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections:

1. Section 31 25 00 “Erosion and Sediment Control” for temporary erosion and sedimentation control measures.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.

2. Removing existing vegetation.

3. Clearing and grubbing.

4. Stripping and stockpiling topsoil.

5. Stripping and stockpiling rock.

6. Removing above and below grade site improvements.

7. Disconnecting, capping or sealing, removing site utilities, and abandoning site utilities in place.

1.3 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches in diameter; and free of weeds, roots, toxic materials.

D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project Site or location identified by the Engineer.

1.5 MATERIAL OWNERSHIP

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

1.6 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or video recordings.

2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

B. Topsoil stripping and stockpiling program.

C. Rock stockpiling program.

D. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.7 QUALITY ASSURANCE

A. Topsoil Stripping and Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

B. Rock Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.8 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by the Engineer.

C. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

D. Utility Locator Service: Notify One Call for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion and sedimentation control and tree-protection measures are in place.

F. Tree and Plant Protection Zones: Protect according to Washington County requirements and as noted on the drawings.

G. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 20 00 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion and sedimentation control 1200C Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion and sedimentation control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site according to the Drawings.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations.

3.4 EXISTING UTILITIES

A. Contractor to locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Engineer not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineer’s written permission.

C. Excavate for, remove and backfill underground utilities indicated to be removed.

3.5 CLEARING AND GRUBBING

A. Clear and grub per Beaverton School District Technical Standards.

3.6 STOCKPILING ROCK

A. Remove from construction area naturally formed rocks that measure more than 1 foot across in least dimension. Do not include excavated or crushed rock.

1. Separate or wash off non-rock materials from rocks, including soil, clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

B. Stockpile rock without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.

1. Do not stockpile rock within protection zones.

2. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.

3.7 SITE IMPROVEMENTS

A. Remove existing above and below grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly sawcut along line of existing pavement to remain before removing adjacent existing pavement. Sawcut faces vertically.

2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION

SECTION 31 20 00 – EARTH MOVING

PART 1 GENERAL

1.1. RELATED DOCUMENTS

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

B. Related Sections:

1. Section 31 10 00 “Site Clearing” for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above and below ground improvements and utilities.

1.2. SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.

2. Preparing subgrades for slabs on grade, walks, pavements, turf and grasses and landscape areas.

3. Excavating and backfilling for buildings and structures.

4. Drainage course for concrete slabs-on-grade.

5. Subbase course for concrete walks and pavements.

6. Subbase course for asphalt paving.

7. Subsurface drainage backfill for walls and trenches.

8. Excavating and backfilling trenches for utilities and pits for buried utility structures.

1.3. DEFINITIONS

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

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.

2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to Contract.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 1 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering or ripping.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

L. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4. PREINSTALLATION MEETINGS

A. Pre- installation Conference: Conduct pre-excavation conference at Project site or location identified by the Engineer.

1. Review methods and procedures related to earthmoving, including, but not limited to, the following:

a. Personnel and equipment needed to make progress and avoid delays.

b. Coordination of Work with utility locator service.

c. Coordination of Work and equipment movement with the locations of tree and plant protection zones.

d. Extent of trenching by hand or with air spade.

e. Field quality control.

1.5. INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.

2. Laboratory compaction curve according to ASTM D 698 or ASTM D 1557.

3. Any additional submittals required by the Beaverton School District Technical Standards.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.6. QUALITY ASSURANCE

A. Blasting is not allowed.

B. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.7. FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by the Engineer.

C. Utility Locator Service: Notify One Call for area where Project is located before beginning earth moving operations.

D. Do not commence earth moving operations until temporary site fencing and erosion and sediment control measures specified in Section 312500 "Erosion and Sediment Control" and tree protection are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.

2. Parking vehicles or equipment.

3. Foot traffic.

4. Erection of sheds or structures.

5. Impoundment of water.

6. Excavation or other digging unless otherwise indicated.

7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 PRODUCTS

2.1. SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory materials per recommendations of the Beaverton School District Technical Standards.

2.2. GEOTEXTILES

A. Subgrade Geotextile

1. Subgrade geotextile should conform to Oregon Standard Specifications for Construction Table 02320-1 (Geotextile Property Values for Drainage Geotextile) and Oregon Standard Specifications for Construction 00350 (Geosynthetic Installation). The geotextile should have a Level “B” certification. A minimum initial aggregate base lift of 6 inches is required over geotextiles.

B. Drainage Geotextile

1. Drainage geotextile should conform to Type 2 material of Oregon Standard Specifications for Construction Table 02320-1 (Geotextile Property Values for Drainage Geotextile) and Oregon Standard Specifications for Construction 00350 (Geosynthetic Installation). The geotextile should have a Level “B” certification. A minimum initial aggregate base lift of 6 inches is required over geotextiles.

PART 3 EXECUTION

3.1. PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2. DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

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

3.3. EXPLOSIVES

A. Explosives: Do not use explosives.

3.4. EXCAVATION, GENERAL

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

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

2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 24 inches outside of concrete forms other than at footings.

b. 12 inches outside of concrete forms at footings.

c. 6 inches outside of minimum required dimensions of concrete cast against grade.

d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.

e. 6 inches beneath bottom of concrete slabs on grade.

f. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or trench.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by the Engineer. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 24 inches outside of concrete forms other than at footings.

b. 12 inches outside of concrete forms at footings.

c. 6 inches outside of minimum required dimensions of concrete cast against grade.

d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.

e. 6 inches beneath bottom of concrete slabs on grade.

f. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or trench.

3.5. EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.6. EXCAVATION FOR WALKS AND PAVEMENTS

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

3.7. EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches in nominal diameter, hand excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.

2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.

3. For flat-bottomed, multiple-duct conduit units, hand excavate trench bottoms and support conduit on an undisturbed subgrade.

4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree and Plant Protection Zones:

1. Hand excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.8. SUBGRADE INSPECTION

A. Notify the Engineer when excavations have reached required subgrade.

B. If the Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof roll subgrade to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

1. Completely proof roll subgrade in one direction. Limit vehicle speed to 3 mph.

2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by the Engineer, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Engineer, without additional compensation.

3.9. UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top

elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by the Engineer.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by the Engineer.

3.10. STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11. BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.

2. Surveying locations of underground utilities for Record Documents.

3. Testing and inspecting underground utilities.

4. Removing concrete formwork.

5. Removing trash and debris.

6. Removing temporary shoring, bracing, and sheeting.

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

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

3.12. UTILITY TRENCH BACKFILL

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

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

C. Backfill voids with satisfactory soil while removing shoring and bracing.

D. Initial Backfill:

1. Place and compact initial backfill of trench backfill, to a height of 12 inches over the pipe.

a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to

avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing

E. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

2. Rock Backfill: Place and compact final backfill of satisfactory trench rock per the Drawings.

3.13. SOIL FILL

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

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

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

2. Under walks and pavements, use engineered fill.

3. Under steps and ramps, use engineered fill.

4. Under building slabs, use engineered fill.

5. Under footings and foundations, use engineered fill.

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

3.14. SOIL MOISTURE CONTROL

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

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

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

3.15. COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials per the recommendations of the Geotechnical Report, dated December 19, 2019, prepared by GeoDesign, Inc.

3.16. GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.

2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

C. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.

2. Walks: Plus or minus 1/2 inch.

3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17. BASE COURSES UNDER PAVEMENTS AND WALKS

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

B. On prepared subgrade, place base course under pavements and walks as follows:

1. Install separation geotextile, where noted on Drawings, on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

2. Place base course material over subbase course under hot-mix asphalt pavement.

3. Shape base course to required crown elevations and cross slope grades.

4. Place base course 6 inches or less in compacted thickness in a single layer.

5. Place base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

6. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.18. DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

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

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

2. Place drainage course 6 inches or less in compacted thickness in a single layer.

3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.19. FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.

2. Determine that fill material classification and maximum lift thickness comply with requirements.

3. Determine, during placement and compaction that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab but in no case fewer than three tests.

2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length but no fewer than two tests.

3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.20. PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by the Engineer; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21. DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by the Engineer.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 31 23 17 - TRENCHING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections:

1. Section 31 20 00 “Earth Moving”

2. Section 31 25 00 “Erosion and Sedimentation Control” for temporary erosion and sedimentation control measures.

1.2 SUMMARY

A. Trench excavation consists of excavation, bedding, backfill and removal or disposal of material as necessary in the installation of water lines, sanitary sewer and storm sewer lines and appurtenances, conduits, conductors, culverts and any other installation requiring trenching.

1. This work includes, but is not limited to, sheeting, bracing, dewatering, disposal of unsuitable materials, and importing approved bedding or backfill material.

2. All work shall be done in accordance with these Specifications and shown on the Drawings in conformity with the lines, grades, and dimensions.

3. Public Right of Way or Easements: All public work construction in the public right of way or easements shall be in accordance with the applicable requirements of the latest edition of the Washington County Design and Construction Standards.

1.3 SITE CONDITIONS

A. Existing Utility Systems: The existing utility systems shown are based on record drawings supplied by the Owner, and “surface” field survey. Prior to constructing any of the utility systems, the Contractor shall “pot-hole” all connection points and utility crossings to verify inverts, sizes, locations, and potential conflicts. Any discrepancies shall be reported to the Engineer for resolution or redesign.

PART 2 PRODUCTS

2.1 MATERIALS

A. Bedding: The bedding of pipes, conduits, cables and structures shall be as shown on the Drawings or as directed by the Engineer. The bedding material shall be placed and thoroughly compacted over the full width of the trench. Upon request, samples of the proposed materials shall be submitted to the Engineer for approval.

B. Backfill: The backfill for pipes, conduits, cables and structures shall be as shown on the Drawings or as directed by the Engineer. The backfill material shall be placed in maximum eight-inch lifts and thoroughly compacted over the full width of the trench. Upon request, samples of the proposed materials shall be submitted to the Engineer for approval.

1. Granular backfill shall be used in all other locations where native backfill is not designated. Unclassified excavated material used as native backfill shall be earth, sand, gravel, rock or combinations thereof, free of humus, organic matter, vegetable matter, frozen material, clods, sticks, and debris and containing no stones having a dimension greater than three inches. The materials shall predominate in the finer sizes and, in place, shall present no voids and no isolated points or areas of larger stones which would cause fracture or denting of the utility or structure or subject it to undue stress. Use of the native backfill shall be approved by the Engineer.

2. Granular backfill shall be used under paved areas, in trenches in streets, in trenches in public right-of-ways and easements, and other areas subject to wheel traffic, and at structures or as designated on the plans. Granular backfill material shall be 1 inch minus crushed aggregate. Top of rock elevation shall be held down at the specified depth in areas designated to receive asphalt paving. All granular backfill shall be placed in maximum eight-inch lifts and compacted to 95% (top 3 feet) and 90% (below 3 feet) maximum dry density per ASTM D 1557.

PART 3 EXECUTION

3.1 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICES

A. The Contractor shall comply with ORS 757.541 through 757.571 and shall notify all utility companies for line locations 72 hours (minimum) prior to start of work.

B. At points where the Contractor's operation could cause damage or interference to railway, telegraph, telephone, television, power, oil, gas, water, irrigation, or other private, public or municipal utilities, the Contractor shall suspend work until all arrangements necessary for the protection thereof have been made by the Contractor.

C. The Contractor shall notify all utility offices which are affected by the construction operation at least 72 hours in advance of excavation. Under no circumstances shall the Contractor expose or interrupt any utility without first requesting permission and being granted to do so from the affected agency.

1. It shall be the Contractor's responsibility, once permission from the utility has been granted, to locate, if necessary, and expose all of the existing underground utilities in advance of the trenching operation.

D. The Contractor shall be solely and directly responsible to the Owner and utility companies for any damage, expense, or claims of any kind brought because of injuries, damages or delay which may result from the carrying out of the work to be done under the Contract.

E. In the event of interruption to domestic water or to other utility services as a result of accidental breakage, or as a result of being exposed, unsupported, or a lack of coordination, the Contractor shall promptly notify the Engineer and the agency involved. The Contractor shall cooperate with the said authority in restoration of service as promptly as possible and shall bear any and all costs of repair.

1. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval of the Engineer or agency involved is granted.

F. Neither the Owner nor its officers or agents shall be responsible to the Contractor for damages as a result of the location of the underground utilities being other than that shown on the plans or for the existence of underground utilities not shown the plans.

3.2 FIELD RELOCATION

A. During construction, minor relocations of the line may be necessary. Such relocations shall be made only with approval from the Engineer. Unforeseen obstructions encountered as a result of such relocations will not become subject to claims for additional compensation by the Contractor to any greater extent that the original lump sum of the contract or unit price of the utility being installed.

3.3 OPEN TRENCHES

A. The Contractor shall not begin the trench excavation until the necessary material is on hand to complete the work involved.

1. The trenches shall be opened in accordance with the lines and grades given for the work, at such times and as far in advance of the work as may be required by the Engineer.

2. Not more than a total of 100 feet of trench shall be opened in advance of the completed utility unless authorized by the Engineer. Related structures must be completed and backfilled at the time of line installation.

3.4 BARRICADES, GUARDS AND SAFETY PROVISIONS

A. To protect persons from injury and to avoid property damage, adequate barricades, construction signs, warning lights, and guards as required shall be placed and maintained during the progress of the work and until it is safe for public use.

1. Watchmen or flag personnel shall be provided as necessary.

2. Rules and regulations of all local and Federal authorities regarding safety provisions shall be observed. The Contractor will be solely responsible for accidents caused by inadequate or insufficient safety provisions.

3.5 PAVEMENT REMOVAL

A. All bituminous and concrete pavements, regardless of the thickness shall be sawcut prior to excavation. Width of the pavement cut shall be equal to the prescribed width of the trench at the ground surface or as shown on the plans.

1. Pavement removed during excavation shall be piled separately from other excavation materials and removed from the site. Pavement shall not be used as backfill material. Uneven pavement edges shall be sawcut before patching the pavement.

3.6 OBSTRUCTIONS

A. This item refers to obstructions which may be encountered and do not require replacement.

1. Obstructions to the construction of the trench such as tree roots, stumps, abandoned piling, buildings and concrete structures, logs, rubbish, and debris of all types shall be removed without additional compensation from the Owner.

2. The Engineer may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment changes can be made within the perpetual easement and right-of-way and without adversely affecting the intended function of the facility or increase costs to the Owner. Sewer and water trenches must be maintained at a minimum specified separation, however.

3.7 INTERFERING STRUCTURES OR ROADWAYS

A. The Contractor shall remove, replace and/or repair any damage done by the Contractor during construction to fences, buildings, cultivated fields, drainage crossings, and any other properties at his own expense without additional compensation from the Owner.

1. The Contractor shall replace or repair these structures to a condition as good as or better than their original condition prior to commencing work in the area.

B. Where paved roadways are cut, granular backfill shall be used as defined in “Materials” above. New pavement shall as specified on the plans and shall not deviate by more than one-quarter inch from the existing finish elevation.

C. If the Contractor encounters existing structures that will prevent construction and are not adequately shown on the plans, he shall notify the Engineer before continuing with the work in order that the Engineer may make such field revisions as necessary to avoid conflict with the existing conditions.

1. The cost of waiting or "downtime" during such field revisions shall be borne by the Contractor without additional cost to the Owner or liability to the Architect.

2. If the Contractor fails to so notify the Architect when a conflict of this nature is encountered, but proceed with construction despite this interference, he shall do so at his own risk with no additional payment.

3.8 EASEMENTS

A. Any damage to private property, either inside or outside the limits of the easements provided by the Owner, shall be the responsibility of the Contractor.

1. Before final payment will be authorized by the Engineer, the Contractor will be required to furnish the Owner with written releases from property owners where special agreements or easements have been obtained by the Contractor or where the Contractor's operations for any reason, have not been kept within the construction right of way obtained by the Owner.

2. Any such special agreements must be in written form and shall not involve the Owner or Engineer as to liabilities in any way.

3.9 GRADES

A. The bottom of the trench shall be excavated to the lines and grades shown on the plans or established by the Engineer with proper allowance for pipe thickness and required bedding. Any trench excavated below grade shall be returned to grade at the Contractor's expense, with fine bedding material.

1. The bedding shall be placed over the full width of the trench in thoroughly compacted layers as previously specified herein. Grades shall be smooth without humps or sags.

B. The Engineer shall be notified with reasonable notice in advance when a section has been excavated and is ready for installation of the utility line or structure. The Engineer at that time will make a determination as to the suitability of the excavation foundation and will give notice to the Contractor to proceed or remove unstable material as covered in "Foundation Stabilization".

3.10 WIDTH OF TRENCH

A. Trenches shall be excavated to a sufficient width to permit proper installation of piping, conduits or related improvements as shown on the plans or required by local standards and specifications.

1. For the installation of utilities or conduits, the minimum width of trenches shall be 18 inches plus the outside diameter of the pipe.

B. In cases where excessive width of excavation would cause damage to adjacent structure, the trench shall not be excavated in excess of the minimum width as specified herein or detailed on the drawings.

3.11 BORING

A. Boring may be used as an approved method in lieu of open trench excavation if approved by the Engineer. The Contractor shall first show just cause and furnish the Engineer with a detailed construction schedule outlining methods, time schedule and proposed safety measures to be incorporated in construction.

1. Upon receiving approval, the Contractor will not deviate from his proposed schedule without first obtaining approval of the Engineer and other respective agencies involved in that portion of the work.

3.12 DE-WATERING

A. Whenever water is encountered in the trench or excavation area, the Contractor shall pump or otherwise dry the bottom of the trench or excavated area before the pipe or conduit installation is commenced. Complete de-watering per Washington County Design and Construction Standards.

1. The Contractor shall not allow water encountered in the trench or excavated area to escape down any pipe or conduit in place unless he first obtains written approval from the Engineer for this method of de-watering.

2. The Contractor will be responsible for cleaning and/or flushing as required, the complete pipe, conduit, or structure. Any soil, aggregate or other foreign matter in the utility prior to acceptance must be removed at the Contractor's expense prior to final acceptance of the work.

3.13 SHORING AND SHEATHING

A. The Contractor shall use whatever means necessary to maintain safe working conditions and protect adjacent property and structures from damage due to excavation. The Contractor shall conform to all federal, state and local regulations governing shoring, sheathing and excavation.

1. When shoring or sheathing is installed, the trench width shall be increased accordingly. The shoring or sheathing shall remain in place until the utility or structure is backfilled to a point where caving could not damage the installation.

2. No payment will be made for shoring or sheathing. All costs involved in placement and removal of shoring and sheathing shall be considered incidental to the work.

3.14 LOCATION OF EXCAVATED MATERIALS

A. During excavation the Contractor shall locate excavated material so as not to block any public right of way, traveled roadways, public or private; and unless otherwise approved by the Engineer, roadways shall be kept open to at least one lane of traffic.

1. The Contractor shall store or waste excavated materials only in designated areas unless otherwise approved by the Engineer. Utmost care shall be taken to prevent spillage or damage to property adjacent to the project.

B. Excavated materials unsuitable for backfill as described herein or not required to meet original or specified grades shall be removed as soon as possible or at least by completion of backfill.

1. No utilities will be considered for payment until these surplus materials have been removed and backfill completed as specified above or as otherwise directed by the Engineer. No additional payment will be made to the contractor for disposal of excess materials.

3.15 FOUNDATION STABILIZATION

A. When in the opinion of the Geotechnical Engineer, the existing material in the bottom of the trench or excavated area is unsuitable for supporting the pipe, conduit or structure or related appurtenances, excavation below the flowline of the pipe or base of other structure shall be executed to a suitable depth as directed by the Geotechnical Engineer.

3.16 MAINTENANCE OF BACKFILL

A. Notwithstanding the type of backfill placement, the backfilled trench or excavation surface shall be maintained until all construction has been completed and accepted by the Owner and Engineer. This maintenance shall include but not be limited to the addition of backfill in settled areas and surface rock or pavement in roadways to keep the trench reasonably smooth and free from excessive ruts and potholes.

END OF SECTION

SECTION 31 25 00 – EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Section:

1. Section 31 10 00 “Site Clearing” for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above and below ground improvements and utilities.

2. Section 31 20 00 “Earth Moving”

3. Section 31 23 17 “Trenching”

C. Public Right-of-Way: All public work construction in the public right-of-way shall be in accordance with the applicable requirements of the Washington County Construction Standards.

1.2 SUMMARY

A. Erosion/Sedimentation Control (ESC) is required on this project. Construction of all erosion control measures shall be in accordance with the Washington County requirements. Compost based BMP’s shall be constructed in accordance with Oregon Department of Transportation Section 00280 – Erosion and Sediment Control specifications and details. All work shall comply with US Army Corps of Engineers and Oregon Department of State Lands Joint Permit and Sections 404 and 401 permit conditions and requirements.

B. This section describes temporary measures and monitoring to control water pollution, soil erosion, and siltation. Erosion, sediment, and pollutant control (EPSC) devices or methods include the use of construction entrances, tree protection fences, diversion dikes, check dams, sediment basins and traps, compost filter sock sediment barriers, compost blanket mulch, gravel, mulches, sediment barriers, grasses, slope drains, and other techniques.

C. The boundaries of the clearing limits and limits of grading shown on this plan shall be clearly flagged in the field prior to construction. During the construction period, no disturbance beyond the flagged clearing area shall be permitted. The flagging shall be maintained by the Contractor for the duration of the construction.

D. The ESC facilities shown on this plan and/or details must be constructed in conjunction with all mass grading and site utility construction, in such a manner as to ensure that sediment and sediment laden water does not enter the drainage system, roadways, or violate applicable water standards.

1.3 SUBMITTALS

A. At the pre-construction meeting, submit the following supplemental EPSC information:

1. Construction start and completion dates.

2. Date when EPSC measures will be in place.

3. Projected date of removal of erosion control structures (after soil is stabilized by vegetation or pavement).

4. Description of control procedures to prevent the discharge of all wash water from concrete trucks into the storm sewer system.

5. Description of procedures for prompt maintenance or repair of EPSC measures utilized on-site.

6. Description of best management practices that will be used to prevent or minimize storm water from being exposed to pollutants from spills, cleaning and maintenance activities, and waste handling activities. These pollutants include fuel, hydraulic fluid, and other oils from vehicles and machinery as well as debris, leftover paints, solvents, and glues from construction operations.

1.4 QUALITY ASSURANCE

A. The Contractor is to comply with all applicable local, State, and Federal ordinances, rules, and regulations concerning erosion and sedimentation control and stormwater runoff.

B. In case of conflict between the above codes, regulations, references, and standards and these specifications, the more stringent requirements shall govern.

C. Conduct a Preconstruction Meeting onsite as directed by the Owner or Owner's Representative prior to the start of construction.

1.5 PROJECT SITE CONDITIONS

A. The Contractor to visit the site and verify all existing conditions affecting the work of this section prior to submitting bids or proposals. Additional compensation will not be allowed for revisions or modification of work resulting from failure to verify existing conditions.

PART 2 PRODUCTS

2.1 GENERAL

A. All products shall conform to the applicable requirements of Washington County requirements and Oregon Department of Transportation specifications Section 00280 – Erosion and Sediment Control.

PART 3 EXECUTION

3.1 GENERAL

A. The implementation of the EPSC measures and the construction, performance monitoring, maintenance, replacement, and upgrading of the EPSC measures are the responsibility of the Contractor until all construction is completed and accepted and vegetation/landscaping and paving is established.

B. The EPSC measures shown on the drawings shall be constructed in conjunction with all clearing, grading, trenching, and earthwork activities and in a manner that ensures that

sediment and sediment-laden water do not enter the drainage system, roadways, or violate applicable water quality standards.

C. The EPSC measures shown on the drawings are the minimum requirements for anticipated site conditions and Contractor methods and sequences. During the construction period, the EPSC measures shall be upgraded as needed for unexpected conditions, storm events, or Contractor methods or sequences and to ensure that sediment and sediment-laden water do not leave the site.

D. The Contractor shall be responsible for implementing temporary erosion control measures during construction to correct unforeseen conditions. The Contractor shall be responsible for additional erosion control due to the Contractor's negligence, carelessness, or failure to install planned controls as a part of the work.

E. Implementation, construction, and maintenance of EPSC measures shall be in accordance with the Washington County requirements.

F. Do not begin soil disturbance activities until perimeter EPSC measures are in place.

G. The erosion control drawings, together with the specifications and 1200-C documents (if applicable) constitute the EPSC plan. A copy of the EPSC plan shall be retained on site and made available to the Washington County staff upon request.

3.2 CONSTRUCTION DETAILS

A. Install and maintain all site public notification signs as shown on the drawings and keep signs easily readable from the public right-of-way throughout the duration of the ground-disturbing activities. Remove and dispose of signs upon completion of work.

B. No visible or measurable erosion material or pollutant shall exit the construction site. Visible or measurable is defined as:

1. Deposits of mud, dirt, sediment or similar material exceeding 1/2 cubic foot in volume in any area of 100 square feet or less on public or private streets, adjacent property, or into the storm and surface water system, either by direct deposit, dripping, discharge, or as a result of the action of erosion.

2. Evidence of concentrated flows of water over bare soils; turbid or sediment laden flows; or evidence of on-site erosion such as rivulets on bare soil slopes, where the flow of water is not filtered or captured on the site.

3. Earth slides, mud flows, earth sloughing, or other earth movement which leaves the property.

C. Employ all reasonable means and methods to control or divert upslope stormwater runoff away from cleared and grubbed areas, stockpiled materials, and other disturbed areas that will be open or stockpiled for periods longer than two-weeks.

D. Construction entrances, exits, and parking areas shall be graveled or paved to reduce the tracking of sediment onto public or private roads. Maintain for the duration of the project.

E. Unpaved roads on the site shall be graveled or under other effective erosion and sediment control measures, either on the road or down gradient, to prevent sediment and sediment-laden water from leaving the site.

F. Preserve existing vegetation where practicable and revegetate open areas after grading or construction.

G. Continuously secure or protect soil stockpiles from runoff and erosion throughout the project with temporary soil stabilization measures or protective cover.

H. Provide ongoing maintenance, repair, and restoration of EPSC measures to keep them continually functional.

1. The following maintenance activities shall be included:

a. Visual or measurable amounts of sediment and pollutants that leave the site shall be cleaned up immediately and placed back on the site or properly disposed. Under no conditions shall sediment be intentionally washed into storm sewers or drainage ways.

b. Clean catch basin protection when design capacity has been reduced by 50 percent.

c. Remove sediment trapped by sediment barriers before it reaches one third of the above-ground barrier height.

d. Remove trapped sediments from sediment basins and traps when design capacity has been reduced by 50 percent.

I. If fertilizers are used to establish vegetation, the application rates shall follow manufacturer's guidelines and the application shall be done in a way that minimizes nutrient-laden runoff to receiving waters.

J. If construction activities cease for 30 days or more, the entire site shall be stabilized using vegetation or a heavy mulch layer, temporary seeding, or another method that does not require germination to control erosion.

K. Any use of toxic or other hazardous materials shall include proper storage, application, and disposal.

L. When trucking saturated soils from the site, either watertight trucks shall be used or loads shall be drained on-site until dripping has been reduced to minimize spillage on roads and streets.

M. Clean all catch basins and inlets protected from sediment prior to paving and final acceptance. The cleaning operation shall not flush sediment laden water into the downstream system.

N. EPSC measures installed during construction shall be removed when construction and site disturbance activity are complete and permanent soil stabilization is in place.

O. Remove and dispose of waste and unused building material.

3.3 WET WEATHER CONSTRUCTION

A. The Contractor is responsible for all additional measures required during wet weather construction between October 1st and May 30th.

3.4 PROTECTION OF ADJACENT PROPERTY

A. Protect adjacent properties from land disturbance, erosion, and sedimentation.

3.5 PROTECTION OF JURISDICTIONAL WETLANDS

A. No work or land disturbance shall occur in jurisdictional wetlands and vegetated corridors prior to issuance of US Army Corps of Engineers and Oregon Department of State Lands Joint Permit.

B. Work shall be completed in compliance with US Army Corps of Engineers and Oregon Department of State Lands Joint Permit and conditions.

3.6 DISPOSITION OF TEMPORARY MEASURES

A. All temporary erosion and sediment control measures shall be disposed of within thirty (30) days after final site stabilization and the establishment of paving and final landscaping.

B. Trapped sediment and other disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion.

END OF SECTION

SECTION 32 11 32 – AGGREGATE BASE COURSES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Related sections:

1. Section 31 10 00 “Site Clearing” for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above and below ground improvements and utilities.

2. Section 31 25 00 “Erosion and Sediment Control” for temporary erosion and sedimentation control measures.

D. The referenced specification for this Section is the "Oregon Standard Specifications for Construction” latest edition as prepared by the Oregon Department of Transportation and the Oregon Chapter of the American Public Works Association, and its revisions and supplements.

E. Public Right-of-Way: All public work construction in the public right-of-way shall be in accordance with the applicable requirements of the Washington County Design and Construction Standards.

1.2 SUMMARY

A. This section specifies requirements for furnishing and placing base course material composed of crushed aggregate.

1.3 SUBMITTALS

A. See section 01 33 00 – Submittals, for submittal procedures.

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

C. Aggregate Composition Test Reports: Results of laboratory test on proposed and actual materials used.

D. Compaction Density Test Reports.

PART 2 PRODUCTS

2.1 MATERIALS

A. Aggregate Base Rock

1. Aggregate base rock below asphalt concrete pavements should be clean, crushed rock or crushed gravel. The base aggregate should contain no deleterious materials, meet specifications provided in ODOT SS 02630.10 – Dense-Graded Aggregate, and have less than 5 percent by weight passing the U.S. Standard No. 200 Sieve.

2. Base aggregate material shall conform to the requirements of the Standard Specification in areas outside of the public right of way, and Washington County Standards for work in the public right-of-way. Refer to the Structural Contract Drawings for additional requirements for aggregate bases under the building.

B. Certification of Aggregate: Prior to the placing of the aggregate base course material, the Contractor shall produce test results from a certified testing laboratory indicating the suitability of the material.

PART 3 EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Aggregate bases shall be placed per the requirements of the Washington County Design and Construction Standards.

B. Compact aggregate base course thoroughly and uniformly to at least 95% of the maximum density as determined by ASTM D1557.

3.2 EQUIPMENT

A. All equipment necessary for the proper construction of this work shall be in first-class working condition before construction is permitted to start, and all other equipment must be able to produce a product meeting the specifications.

3.3 MAINTENANCE

A. Following the completion of the base course, the Contractor shall perform all maintenance work necessary to keep the base course in a condition satisfactory for paving.

END OF SECTION

SECTION 32 12 16 – ASPHALT PAVING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections

1. Section 31 20 00 “Earthwork”.

1.2 SUMMARY

A. Work of this Section consists of furnishing and applying asphalt mixes, tack coats, and placing asphalt concrete pavement in accordance with the applicable requirements of the standards listed below.

1. The asphalt concrete shall be constructed on a prepared underlying course in accordance with these specifications and shall conform to the dimensions and typical cross and with the lines and grades section shown on the plans.

2. The referenced specification for this Section is the "Oregon Standard Specifications for Construction” latest edition as prepared by the Oregon Department of Transportation and the Oregon Chapter of the American Public Works Association, and its revisions and supplements.

3. Public Right-of-Way: All public work construction in the public right-of-way shall be in accordance with the applicable requirements of the Washington County Design and Construction Standards.

PART 2 PRODUCTS

2.1 ASPHALT MATERIALS

A. Asphalt Mix Design

1. Provide mix design for ½” Dense, Level 2 ACP as specified on the plans in accordance with the Standard Specifications, and the applicable requirements of the Washington County Design and Construction Standards.

2. Asphalt binder should be performance graded and conform to PG 64-22 or better.

B. Tack Coat

1. Tack coat material shall be CSS-1 or CSS1h in accordance with the Standard Specifications, and the applicable requirements of Washington County Design and Construction Standards.

PART 3 EXECUTION

3.1 PLACEMENT

A. Tack Coat: Per the Standard Specifications

1. All curbs, longitudinal and transverse joints shall be coated with a sufficient amount of tack coat material prior to placing the adjacent panel. This may be accomplished with hand distribution equipment.

2. Contractor shall be responsible for removing any tack applied to exposed curb faces or other finish surfaces. Tack all surfaces between layers.

B. Asphalt Concrete Paving Surface Course

1. Meet requirements of the Standard Specifications, the applicable requirements of Washington County.

2. Obtain approval for aggregate base course before placing paving surface course.

3. In Oregon, the AC surface temperature during paving should be at least 40 degrees Fahrenheit for lift thickness greater than 2.5 inches and at least 50 degrees Fahrenheit for lift thickness between 2.0 and 2.5 inches.

4. Place asphalt materials at temperatures between 200 and 250 degrees F.

5. Compact asphalt surface course thoroughly and uniformly to at least 91% of maximum specific gravity as determined by AASHTO T209.

6. Meet minimum and maximum lift thickness of 1.5 and 3.0 inches, respectively.

3.2 TESTING AND INSPECTION

A. Asphalt density tests may be conducted on placed asphalt at the frequency determined by the Engineer. All tests, initiated by the Engineer, will be at the Owner's expense. The Owner will designate an independent testing laboratory and the contractor shall notify the laboratory 48 hours prior to paving so that tests can be scheduled and performed.

END OF SECTION

SECTION 32 13 13 – CONCRETE PAVING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections:

1. Section 32 11 32 “Aggregate Base Courses”

2. Section 32 13 73 “Concrete Paving Joint Sealants” for joint sealants in expansion and construction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.2 SUMMARY

A. This Work consists of the construction of Portland cement concrete sidewalks, curbs and gutters, and driveways.

1. The Portland cement concrete shall be constructed on a prepared underlying course in accordance with these Specifications and shall conform to the dimensions and typical cross section and with the lines and grades shown on the plans.

2. The referenced specification for this Section is the "Oregon Standard Specifications for Construction” latest edition as prepared by the Oregon Department of Transportation and the Oregon Chapter of the American Public Works Association, and its revisions and supplements.

3. Public Right-of-Way: All public work construction in the public right-of-way shall be in accordance with the applicable requirements of the Washington County Design and Construction Standards.

4. All sidewalks and ramps shall be constructed to American's with Disabilities Act (ADA) standards.

B. Roadways, sidewalks, curbs, and driveways shall be constructed in accordance with this Specification and related Sections, at the respective locations shown on the plans to the lines, grades, dimensions and designs shown on the plans or established by the Engineer.

1.3 SUBMITTALS

A. Concrete Mix Design.

1.4 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

2. Do not use frozen materials or materials containing ice or snow.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 PRODUCTS

2.1 CONCRETE

A. Concrete Mix Design Constituents shall be per the Washington County Design and Construction Standards.

2.2 REINFORCEMENT

A. Reinforcement shall be per the details shown on the plans.

2.3 TRUNCATED DOMES

A. Place pre-cast truncated dome detectable warning tile in the lower 2 feet of all pedestrian ramp throats per plans and details. The truncated dome detectable warning surface must be installed during the concrete pouring. Once the concrete is graded, smoothed and finished, place the detectable warning tile in the lower 2 feet of the pedestrian ramp, per manufactures recommendations.

1. Detectable warning tile shall be compliant with ADA Standards for Accessible Design, Washington County, and Oregon Transportation Commission Standards for Accessible Parking Places.

PART 3 EXECUTION

3.1 GENERAL

A. All Work shall comply the requirements of the Washington County Design and Construction Standards.

B. Concrete within pedestrian areas to have a light broom finish for anti-slip.

C. Private sidewalks to be minimum 3500 psi strength concrete, 4” thickness over minimum 4” of ¾” minus aggregate base.

D. Expansion joints are required for concrete every 30 feet for curbs and sidewalks; continuous along the perimeter adjoining buildings and every 20 feet in each direction for patios, plazas, courtyards, etc. Control joints shall be a maximum of 5’ for sidewalks.

3.2 PREPARATION FOR HANDLING AND PLACEMENT OF CONCRETE

A. In preparation for placing of concrete, all sawdust, chips and other construction debris or extraneous matter shall be removed from the interior of the forms or base. Any standing water shall be removed and a firm, stable base verified.

B. Struts, stays and braces serving temporarily to hold the forms in the correct shape and alignment prior to the placing of concrete shall be removed when the concrete placing has reached the elevation rendering their service unnecessary. These temporary members shall be entirely removed from the forms and not buried in the concrete.

3.3 PREPARATION OF BASE

A. Areas on which sidewalks, curbs, and driveways are to be constructed shall be brought to proper lines and grade and compaction specified on the Drawings. The base shall be moistened before Portland cement is placed thereon and shall also be moist and firm at the time the concrete is placed.

3.4 TESTING AND INSPECTION

A. Slump tests, air entrainment, and cylinder tests may be conducted on poured in place concrete at the frequency determined by the Engineer. All tests, initiated by the Engineer, will be at the Owner's expense. The Owner will designate an independent testing laboratory and the contractor shall notify the laboratory 48 hours prior to all pours so that tests can be scheduled and performed.

3.5 CONCRETE CONSOLIDATION

A. Concrete, during and immediately after depositing, shall be thoroughly consolidated. The consolidation shall be done by mechanical means, such as spading, or high frequency vibrators, and shall ensure smooth surfaces and dense concrete along form surfaces or in corners, etc.

3.6 PROTECTION

A. The completed concrete surface shall be protected from damage until the project is accepted. The contractor shall be responsible to protect concrete from damage and/or vandalism for the first 24 hours following a pour. The Contractor shall repair damaged concrete and clean concrete discolored during construction. Surfaces that are damaged shall be removed and reconstructed for the entire length between regularly scheduled joints. Refinishing the damaged portion will not be acceptable. Removed portions shall be disposed of off the project site by the Contractor at no additional cost to the Owner.

END OF SECTION

SECTION 32 17 23 – PAVEMENT MARKINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes painted markings applied to asphalt and concrete pavement.

1.3 REFERENCE STANDARDS

A. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com

B. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; http://mutcd.fhwa.dot.gov; current edition.

1.4 SUBMITTALS

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

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

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation methods.

C. Certificates: Submit for each batch of paint and glass beads stating compliance with specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver paint in containers of at least 5 gallons (18 L) accompanied by batch certificate.

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

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.6 FIELD CONDITIONS

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

PART 2 PRODUCTS

2.1 MATERIALS

A. Line and Zone Marking Paint: MPI No. 97 Latex Traffic Marking Paint; color(s) as indicated or noted on plans.

1. Parking Lots: White.

2. Bus Symbols and Striping: Yellow.

3. Fire Lane: Red.

4. ADA Symbols: Blue

B. Thermoplastic

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

3.2 PREPARATION

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

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Obliteration of existing markings using paint is acceptable in lieu of removal; apply the black paint in as many coats as necessary to completely obliterate the existing markings.

D. Clean surfaces thoroughly prior to installation.

1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.

2. Completely remove rubber deposits, existing paint markings, and other coatings adhering to the pavement, by scraping, wire brushing, sandblasting, mechanical abrasion, or approved chemicals.

3. Sandblasting: Use equipment of size and capacity necessary, providing not less than 150 cfm (0.08 cu m per second) of air at pressure not less than 90 psi (625 kPa) at each nozzle used.

E. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.

F. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.

G. Temporary Pavement Markings: When required or directed by Engineer, apply temporary markings of the color(s), width(s) and length(s) as indicated or directed.

1. After temporary marking has served its purpose, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method so that surface to which the marking was applied will not be damaged.

2. At Contractor's option, temporary marking tape may used in lieu of temporary painted marking; remove unsatisfactory tape and replace with painted markings at no additional cost to Owner.

3.3 INSTALLATION

A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.

B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F (10 degrees C) or more than 95 degrees F (35 degrees C).

C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.

D. Comply with FHWA MUTCD manual (http://mutcd.fhwa.dot.gov) for details not shown.

E. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.

F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.

1. Apply paint in one coat.

2. Wet Film Thickness: 0.015 inch (0.4 mm), minimum.

3. Width Tolerance: Plus or minus 1/8 inch (3 mm).

G. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.

1. Mark the International Handicapped Symbol at indicated parking spaces.

2. Hand application by pneumatic spray is acceptable.

H. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

3.4 DRYING, PROTECTION, AND REPLACEMENT

A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.

B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.

C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.

D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.

E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.

F. Replace removed markings at no additional cost to Owner.

END OF SECTION

SECTION 329113 – SOIL PREPARATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following

1. The work covered in this section consists of furnishing all labor, materials and equipment for testing, preparation, and placement of topsoil, water quality media and compost as indicated by the drawings and as specified.

2. Coordinate placement of topsoil or water quality media and required soil amendments with the establishment of rough grades.

3. Coordinate depths of soil amendments and topsoil with grading specifications for rough and finish grades.

4. All rough grading operations shall be completed as required by these specifications. Topsoil placement or backfilling in areas to be landscaped shall not occur until the Owner's Representative has issued written approval of the rough grade and topsoil.

B. Related Sections include the following:

1. Section 015639; Temporary Plant Protection.

2. Section 312200; Grading.

3. Section 328000; Irrigation.

4. Section 329219; Seeding.

5. Section 329300; Plants.

1.3 DEFINITIONS

A. Soil classifications standards used herein for existing and imported soils include but are not limited to the following.

1. ASTM Soil Quality Standards.

2. Classification: ASTM D 2487-00.

3. Gradation of Soils: ASTM D 422-63 (1998).

4. Liquid Limit and Plasticity Index: ASTM D 4318-94(2001).

5. Moisture-Density Relations: ASTM D 1557-00.

6. Permeability of Soils: ASTM D 2434-68(2000),

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

C. Water Quality Mix: Free draining soil mix produced off-site by blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

E. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

F. Subgrade Soil: Friable soil, free from contaminants and materials deleterious to plant growth to depth as specified.

1.4 SUBMITTALS

A. At least 7 working days prior to use on site or the start of work, the Contractor shall submit the following information to the Owner's Representative. All product samples must include sufficient volume for the Owner's Representative to make a reasonable analysis.

1. Certified Analysis:

   a. All compost mixture components required by these specifications or as required by testing laboratories to bring soil into compliance with these specifications.
   b. All fertilizer mixes required by the specifications or as required by testing laboratories to bring soil into compliance with these specifications.
   c. All on-site or imported topsoil or water quality soil media required by these specifications.

2. Where any tests show results failing to conform to the required standards the Contractor shall include with the testing report a recommended treatment plan to bring the material into conformance.

3. Product Samples:

   a. Backfill Soil Mixture.
   b. Water Quality Mixture.

1.5 QUALITY ASSURANCE

A. Soil Preparation – All soil preparation work shall be done under the supervision of a Contractor having experience in landscape construction. All work shall be done in accordance with proper horticultural practices.

B. Herbicide Application - Applications of herbicide for weed control, as required, shall be made only by an applicator currently licensed under State and Federal law/

C. The Contractor shall store fertilizer and other required materials in a dry place and free from the intrusion of moisture.

D. All topsoil and compost must be tested by an independent testing laboratory and certified that it is in conformance with the requirements of these specifications.

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

F. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cat-ion exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Topsoil Analysis Report must include analysis of suitability of topsoil for plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrient, soil conditioners and soil amendments may be added to produce satisfactory topsoil.

G. Compost Analysis: Furnish compost analysis by a qualified testing laboratory stating the volumes, quantities, and ratios of component parts specified.

1. Compost Analysis Report must include analysis of suitability of compost for plant growth. State volumes and quantities of recommended amendments necessary to produce satisfactory compost.

1.6 PROJECT CONDITIONS

A. Prior to the work of this section all rough graded surfaces shall be free of:

1. Concrete, asphalt, and other construction debris;

2. Limbs, twigs, cones, seed-pods and other woody material; and

3. Rock, gravel or other material not suitable for plant growth.

B. In all plant bed areas the sub-grade shall be free of unsuitable material such as stumps, roots, rocks, concrete, asphalt, or metals, for a minimum depth of 24 inches and in all lawn or seeded areas the sub-grade shall be free of unsuitable material for a minimum depth of 12 inches.

C. The Contractor shall provide protective covers and barriers as necessary to prevent damage and staining to all site improvements.

D. The Contractor shall 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.

E. The Contractor shall take all reasonable precautions to prevent runoff of topsoil and fertilizers from leaving site or entering storm systems, or any waterway.

1.7 SEQUENCING AND SCHEDULE

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

PART 2 PRODUCTS

2.1 PLANTING SOILS

A. Planting Soil:

1. ASTM D 5268.

2. Acidity range (pH) of 5.5 to 7.

3. A minimum of 4 percent, and a maximum of 20 percent organic material content by volume.

4. A maximum of 25 percent decaying content by volume.

5. Free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

6. Textural Class Requirements: Topsoil textural analysis shall fall within the following gradations.

Textural Class	% of Total Weight	Average %
Sand (0.05-2.Omm dia.)	45 – 75	60%
Silt (0.002-0.05mm dia.)	15 – 35	25%
Clay (less than 0.002mm dia.)	05 – 20	15%

B. Subgrade Soil: Friable soil, free from contaminants and materials deleterious to plant growth to depth as specified in Part 1 – General, Project Conditions.

2.2 WATER QUALITY MIX

Furnish imported topsoil for vegetated stormwater facilities conforming to the following:

A. Standard Blend for public and private facilities – Use this blend for all vegetated stormwater management facilities, except those in the right-of-way.

1. General Composition - The material shall be any blend of loamy soil, sand, and compost that is 30-40% compost (by volume) and meets the other criteria in this specification.

a. Analysis Requirements for the Blended Material:

1) Particle Gradation - A particle gradation analysis of the blended material, including compost, shall be conducted in conformance with ASTM

C117/C136 (AASHTO T11/T27). 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

The blend shall have a Coefficient of Uniformity (D60/D10) equal to 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.

2) Acidity - The pH (Power of Hydrogen) of the blended material shall be tested and be between 6 to 8.

b. General Requirements for the Blended Material:

1) The material shall be loose and friable.

2) It shall be well mixed and homogenous.

3) It shall be free of wood pieces, plastic, and other foreign matter.

4) It shall have no visible free water.

2.3 INORGANIC SOIL CONDITIONERS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows?

B. Class: Class T, with a minimum 99 percent passing through No. 8 sieve and a minimum 75 percent passing through No. 60 sieve.

C. Class: Class O, with a minimum 95 percent passing through No. 8 sieve and a minimum 55 percent passing through No. 60 sieve

D. Provide lime in form of dolomitic limestone.

E. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 sieve and a maximum 10 percent passing through No. 40 sieve.

F. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

G. Aluminum Sulfate: Commercial grade, unadulterated.

H. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

I. Sand: Clean, washed, natural or manufactured, free of toxic materials.

J. Diatomaceous Earth: Calcined, diatomaceous earth, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

K. Calcined Clay: An inorganic soil amendment formed by expanding clay at high temperatures (calcining), and used to alter soil strength by affecting its ability to retain moisture.

L. EarthLite Fiter Media, as manufactured by Sunmark Seeds; 1.888.214.7333; Contact – Robin Cook.

M. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

N. For bidding assume placement and incorporation of 35 lbs. of dolomitic lime per 1,000 square feet.

2.4 SOIL AMENDMENTS

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; bio-solids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture, with a pH range of 3.4 to 4.8.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.

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

1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with at least 0.15 lb of ammonium nitrate or 0.25 lb of ammonium sulfate per cubic foot of loose sawdust or ground bark.

E. 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.

F. For bidding assume planting and seeding beds and areas be amended with 2 inches of compost tilled into the top 6 inches of finished grade.

2.5 FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 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. For bidding assume 10 percent nitrogen, 6 percent phosphorus, and 4 percent potash by weight. At least 50 percent of total nitrogen shall contain no less than 3 percent water-insoluable nitrogen. At least 60 percent of nitrogen content shall be derived from super-phosphate containing not less than 18 percent phosphoric acid or bone meal containing 25 percent – 30 percent phosphoric acid and 2 – 3 percent nitrogen. Potash shall be derived from muriate of potash containing 55 – 60 percent potash.

2.6 PRE-EMERGENT HERBICIDE

A. Pre-emergent herbicide shall be as directed for condition by currently licensed herbicide applicator.

2.7 POST-EMERGENT HERBICIDE

A. Post-emergent herbicide shall be as directed for condition by currently licensed herbicide applicator.

2.8 WATER

A. Water shall be suitable for irrigation, free from oil, acid, alkali, salt or other substances harmful to plant life.

PART 3 EXECUTION

3.1 EXAMINATION

A. The Contractor shall examine the entire site for conditions that will adversely affect execution, permanence and quality of work, and survival of plant materials. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Rough Grading Inspection - Contractor shall notify Owner's Representative a minimum of 72 hours in advance for inspection of rough grades.

C. The Contractor shall 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, the Contractor shall perform necessary corrective work.

3.2 GENERAL PREPARATION OF GROUND SURFACES – ALL PLANTING OR SEEDING AREAS

A. The Contractor shall eliminate uneven areas and low spots, 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. The Contractor shall verify that invasive species and weeds have been eliminated prior to the placement of topsoil. The Contractor must not place topsoil until all living weed matter has been eliminated.

C. Weed eradication shall include herbicide and non-herbicide methods. Eradication shall include and is not limited to elimination of the following invasive species and weeds:

Cirsium arvense (Canadian Thistle).

Convolvulus spp. (Morning Glory).

Cytisus scoparus (Scotch Broom).

Dipsacus sylvestris (Common Teasel).

Equisetum spp. (Horsetail).

Festuca arundinaceae (Tall Fescue).

Hedera helix (English Ivy).

Holcus canatus (Velvet Grass).

Lolium spp. (Rye Grasses).

Lotus corniculatus (Bird's Foot Trefoil).

Lythrium salicaria (Purple Loose Strife).

Melilotus spp. (Sweet Clover).

Myriophyllum spicatum (Eurasian Milfoil).

Phalaris arundinaceae (Reed Canary Grass).

Rubus discolor (Himalayan Blackberry).

Solanum spp. (Nightshade).

Trifolium spp. (Clovers).

1. Herbicide application shall be by manual 'spot spraying', wicking, or backpack methods per manufacturer's specifications.

2. Herbicide application shall be as directed by a currently licensed applicator and shall be strictly applied by manufacturer's specifications, and applicable codes and regulations.

3. Remove invasive plant material after herbicide application has effectively stopped plant growth. Dispose legally off-site.

4. After initial spraying and removal of weeds, and prior to placing topsoil, the contractor shall water the subgrade sufficiently to germinate dormant weed seeds.

    a. Prior to this weed crop producing seeds, the contractor shall spray these weeds with herbicide and remove them from the site.
    b. Before continuing with topsoil placement the contractor shall verify with the Owner’s Representative whether or not to repeat this treatment,

5. Selective hand removal by non-herbicide methods shall be utilized if herbicide application threatens existing plantings.

6. Existing or new plantings damaged or killed by herbicide application shall be replaced immediately at no additional cost to the Owner.

3.3 PLACING PLANTING SOILS

A. Verify that planting soil is stockpiled in sufficient quantities to be placed at depths specified. The Contractor shall notify the Owner’s Representative immediately if supplies are inadequate or do not meet specifications for topsoil. The Contractor shall provide imported topsoil meeting the requirements of this section if the supply of existing on-site topsoil is insufficient.

B. Planting soil shall be placed at specified grades between any existing or constructed points on the site, such as curbs, walls, walks and paving.

3.4 SOIL PREPARATION IN PLANTING BEDS

A. Prepare subgrade to depth as specified in Part 1 – General, Project Conditions

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

1. Apply 16-16-16 fertilizer at a rate of 6 lbs. per 1000 s.f. directly to subgrade before loosening.

2. Thoroughly blend planting soil mix off-site before spreading.

a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
b. Allow Mix line with dry soil before mixing fertilizer.

3. Spread planting soil mix to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

a. Spread approximately 4 inches of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil in 4-inch lifts.
b. Allow sufficient depth of topsoil placement to allow for finish grade to be one 1-inch below any paved surface after placement of bark mulch.

C. 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.

D. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.5 SOIL PREPARATION IN SOD AND SEEDED LAWN AREAS

A. Limit lawn subgrade preparation to areas to be planted.

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

1. Apply 16-16-16 fertilizer at a rate of 6 lbs. per 1000 s.f. directly to subgrade before loosening.

2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.

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.

3. Spread planting soil mix to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

a. Spread approximately 4 inches of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil in 4-inch lifts.
b. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.

2. Loosen surface soil to a depth of at least of 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.

    a. Apply 16-16-16 fertilizer at a rate of 6 lbs. per 1000 s.f. directly to subgrade before loosening.

3. Remove stones larger than 1-inch in any dimension and sticks, roots, trash, and other extraneous matter.

4. Legally dispose of waste material, including grass, vegetation, and turf.

D. Seeded Grass:

1. Rototill surface of seedbed to a minimum depth of 6 inches.

2. Regrade and float to final finish grade, adding topsoil where required, with final grade to match existing or revised slopes, banks, etc. Grade to eliminate washing and puddles. Slope to drain water away from all buildings or structures.

E. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus ½-inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.

F. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

G. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

1. The Contractor is responsible to reimburse the Owner for the certified appraised value of any designated plant material damaged or removed without the approval of the Owner's Representative.

3.6 CLEANUP

A. Keep project site free from accumulation of debris, topsoil, and other material.

B. At completion of each area of work, completely remove debris, equipment and surplus materials.

C. Any paved area or surfaces stained or soiled from landscaping materials shall be cleaned with a power sweeper using water under pressure. Building surfaces shall be washed with proper equipment and materials as approved by the Owner's Representative.

END OF SECTION

SECTION 329219 – SEEDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work consists of providing all labor, material and equipment for installing and establishing seeded Field Grass, Lawn and other special seed mixes as indicated below.

1. Plant and establish seed mixture(s) in areas shown on drawings.

B. Related Sections include the following:

1. Section 015639; Temporary Plant Protection.

2. Section 32800; Irrigation.

3. Section 329113; Soil Preparation.

4. Section 329300; Plants.

1.3 DEFINITIONS

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

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

C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Certifications: From seed vendor for each grass-seed mono-stand or mixture stating the botanical and common name and percentage by weight of each species and variety, and

percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod, identifying source, including name and telephone number of supplier.

C. Product Certificates: For soil amendments and soil conditioners, signed by product manufacturer.

1.5 QUALITY ASSURANCE

A. Work performed as described in this section shall be done under the supervision of a contractor having experience in landscape construction.

B. Work and material supplied shall comply with applicable requirements of the United States Department of Agriculture (USDA).

C. Delivery, Storage, and Handling:

1. Deliver grass seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging and location of packaging. Damaged packages are not acceptable.

2. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.6 PROJECT CONDITIONS

A. Season: Seed or sod only between March 15 and October 15.

B. Weather conditions: Seeding is not permitted during the following conditions:

1. Cold weather: When air or surface temperature is less than 32 degrees F.

2. Hot weather: When air temperature is greater than 80 degrees F.

3. Soil Temperature: When soil temperature is less than 55 degrees F.

4. Wet weather: When ground becomes saturated.

5. Windy weather. When wind velocity is greater than 10 mph.

1.7 SUBSTANTIAL COMPLETION

A. Substantial completion is achieved after the Contractor has installed all plants, seeding and associated materials, and provides Owner's Representative with a written request to inspect said work. Plant and seed areas will be considered substantially complete when in compliance with the following conditions as directed by the Owner's representative and documented by written acknowledgement of Owner's Representative.

1. Plant Conditions: Healthy, free of pests and disease, and in vigorous condition.

2. Turf: Healthy, free of pests and disease, and with 90 percent cover and no bare areas greater than six square inches.

3. Roots: Seeding roots thoroughly knitted to the soil.

1.8 WARRANTY

A. The warranty of plant materials furnished and planted under this contract shall be for one full year from the date of Substantial Completion and written acceptance as specified herein.

B. At the end of the warranty period, all seeded areas not meeting requirements of these specifications shall be reseeded with the same species and size as originally specified. Such replacement shall be made in the same manner as specified for the original plantings, and at no extra cost to the Owner. The warranty on reseeded areas shall be extended for one full season's cycle after reseeding has been completed.

PART 2 - PRODUCTS

2.1 SEED MIXES

A. General

1. Seed shall meet or exceed Blue Tag quality according to current Oregon Certified Seed Standards published by Oregon State University,

2. Seeds shall be labeled in accordance with USDA Rules and Regulations under the Federal Seed Act.

3. Seeds shall be furnished in sealed, standard containers unless written exception is granted.

4. Noxious weed seed not to exceed 1% by weight.

5. Seed that is wet or moldy or has been damaged in transit will not be accepted.

B. The Contractor shall furnish suppliers certificate guaranteeing that the seed conforms to the above requirements and USDA certification. Seed shall be delivered to the contract site in unopened containers bearing the USDA and suppliers certificates.

2.2 WATER

A. Water shall be free from oil, acid, alkali, salt and other substances harmful to growth of grass, and shall be from a source approved prior to use.

2.3 MULCH

A. Straw Mulch: For use where manually or hydraulically applied seed is subject to wind or water erosion. Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Sphagnum Peat Mulch: Partially decomposed sphagnum peat moss, finely divided or of granular texture, and with a pH range of 3.4 to 4.8.

C. Muck Peat Mulch: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.

D. Compost Mulch: 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 1-inch sieve; soluble salt content of 2 to 5 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.

E. Wood-Cellulose Fiber Mulch: For use with the hydraulic application of grass seed and fertilizer.

1. Biodegradable, dyed-wood, cellulose-fiber mulch.

2. Dyed an appropriate color to facilitate visual metering of application materials.

3. Nontoxic and free of plant-growth or germination inhibitors.

4. Maximum moisture content of 15 percent air-dry basis.

5. pH range of 4.5 to 7.5.

F. Nonasphaltic Soil Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors. Tackifier shall be capable of penetrating soil surface and binding soil particles; shall provide an adhesive to hold seed and wood-cellulose fibers together and bond them to the soil; and shall be made from naturally occurring and biodegradable materials. Specified tackifier shall be J-Tac or approved equal, per manufacturer's specification for applicable condition, as manufactured by Reclamare Company, 20727 7th Avenue South, Seattle, Washington (206-824-2385).

G. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.4 SPECIAL SEEDING AND MULCHING EQUIPMENT

A. Hydraulic equipment used for the application of fertilizer, seed and slurry of prepared wood-cellulose fiber shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend and homogeneously mix the slurry specified. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of spray nozzles that will provide even distribution of the slurry on the various slopes.

PART 3 - EXECUTION

3.1 GENERAL PREPARATION

A. Verify that grading and soil preparation has been completed correctly.

1. Notify Owner's Representative of any discrepancies; do not proceed with work until discrepancies have been resolved.

B. Notify Owner's Representative at least 24 hours prior to planting or seeding operations. Owner's Representative will inspect soil preparation, plant materials and plant orientation.

3.2 LAWN PREPARATION

A. Limit lawn subgrade preparation to areas to be planted. Prepare Sodded Lawn and Seeded areas as directed in Division 2, Soil Preparation.

3.3 SEEDING (all seeded areas)

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged.

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

C. Protect seeded areas with slopes exceeding 1:6 with erosion-control fiber mulch and 1:4 with erosion-control blankets or mats installed and stapled according to manufacturer's written instructions.

D. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

1. Anchor straw mulch by crimping into topsoil with suitable mechanical equipment.

2. Bond straw mulch by spraying with asphalt emulsion at the rate of 10 to 13 gal./1000 sq. ft.. Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.

E. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch within 24 hours after completing seeding operations. Soak and scatter uniformly to a depth of 3/16-inch and roll to a smooth surface.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with nonasphaltic tackifier.

2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply mulch at a minimum rate of 1500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry application at a minimum rate of 500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate. Apply slurry cover coat of fiber mulch at a rate of 1000 lb/acre.

3.5 FIRST MOWING

A. Mow turf and other 'manicured' seed areas when seed has germinated to a thick stand 4 inches in height, to 1-1/2 inches from ground level with a sharp, sterile, power mower. Remove clippings and dispose legally offsite or cut turf with 'mulching' mower of sufficient power to thoroughly cut and distribute clippings at soil level of lawn.

B. Mow Field Grass when seed has germinated to a thick stand leaving no bare spots larger than 4 inches in diameter. Remove clippings and dispose legally offsite.

3.6 ACCEPTANCE OF SEEDED AREAS

A. Satisfactory Seeded Areas: Unless otherwise specified all seeded areas shall at the time of substantial completion, exhibit a healthy, uniform, close stand of the specified seed mix, free of weeds and surface irregularities, with coverage of mix in specified proportions, exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Satisfactory Seeded Turf: At the time of substantial completion, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

C. Satisfactory Sodded Turf: At the time of substantial completion, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

D. Reestablish turf that does not comply with requirements and continue maintenance until lawns are satisfactory.

3.8 CLEANUP, PROTETION AND ACCEPTANCE

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

C. Remove non-degradable erosion-control measures after grass establishment period.

D. Obtain written Conditional Acceptance from the Owner's Representative after all turf areas have been mowed at least twice.

END OF SECTION

SECTION 329445 – LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, and environmental permit conditions apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Furnish labor, material, and equipment required to maintain landscaped areas for one year after date of Substantial Completion. Term of maintenance shall commence only after date of final written approval.

2. Supply landscape maintenance quote as separate line item in construction proposal.

B. Related Sections include the following:

1. Section 015639; Temporary Plant Protection

2. Section 328000; Irrigation.

3. Section 329219; Seeding.

4. Section 329300; Plants.

1.3 SUBMITTALS

A. Maintenance Schedule: Upon beginning of maintenance contract, submit a proposed schedule of visit dates and services as outlined herein.

B. Maintenance Schedule Updated (Yearly): At the beginning of each year, by January 15th, the Contractor shall submit a complete revised yearly schedule of maintenance operations indicating timing of scheduled visits, method of weed control, access and mobility issues. At the end of each year, by December 1st, the Contractor shall submit a written summary of the year's activities, including: the record of irrigation winterization and start-up; irrigation schedule, repairs and adjustments; herbicide types and applications; water level conditions; repair, replacement, or restoration activities; and any conditions addressed outside of the scheduled tasks specified herein.

1.4 HERBICIDE PROGRAM

A. Prior to starting herbicide and chemical control programs, submit a monthly herbicide application schedule and application specification as written by manufacturer of herbicide, and a currently licensed herbicide applicator. Notify Owner's Representative of herbicide application

type and schedule prior to seasonal application. Submit rates, quantities, and types per Federal, State and Local jurisdictions, per code and submit copies to Owner.

PART 2 - PRODUCTS

2.1 GENERAL

A. Fertilizer shall be Webfoot Organic Deluxe 10-10-5 or Webfoot 5-15-10 cottonseed meal based fertilizer.

B. Staking and Guying Materials: Provide staking and guying materials in accordance with project specifications, details and drawings.

C. Mulch: Provide mulch to match planting beds and individual plant locations in accordance with project specifications, details and drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Debris and Trash Removal: Remove all trash and debris from site.

B. Leaf Raking and Removal: Remove all leaves from site.

3.2 PLANTING BED MAINTENANCE

A. Replace all damaged, dead, or dying plants covered by warranty within 30 days of initial identification of condition.

B. Fertilizing at planting beds: Apply 20 lb. per 1,000 square feet of specified organic base commercial fertilizer two times per growing season. First application on March 15 and the final application on June 15. All fertilizer shall be washed off foliage and watered in thoroughly if not watered by normal rainfall. Use cottonseed meal base Rhododendron fertilizer such as Webfoot 5-15-10 for all acid-loving (ericaceous) plants instead of 10-10-5 organic base fertilizers.

C. Weeding: Maintain clean planting beds by pulling and removing all weeds. Check weekly during the growing season and at least bi-weekly at other times.

D. Pruning: Prune to shape plantings as needed or directed to conform to the natural growth patterns. Remove all dead or diseased wood from the plantings.

E. Mulching: Keep a 2-inch mulch of medium coarse bark mulch on the planting beds at all times. Rake mulch in early spring before applying new cover to break "crust" of old mulch.

F. Spraying: Spraying shall occur only by a currently licensed applicator.

G. Watering: Shall be by specified irrigation program, excepting new plantings or replacement plantings that shall be watered in as planted. Verify balance of watering on new or replacement planting with Owner. One-inch per week is sufficient during growing season on established

plantings. Increase watering to one-and-a-half inches per week during warm season. Adjust watering schedule or frequency, if evidence of excess puddling or runoff is encountered.

H. Remove all debris from site after each visit, and dispose legally offsite.

3.3 LAWN MAINTENANCE

A. Start water application as soon as season requires. Apply water in sufficient quantities and at sufficient intervals to maintain lawn in good color and health. Do not allow surface run-off. Cease watering operations when seasonal rains provide ample water to maintain lawn.

B. Mow at least once per week during the normal growing season. Normal height of cut is 1 1/2 inches. Utilize clean, sharp equipment that is cleaned of bacteria, chemicals, fungus etc., prior to use on project site. Remove grass clippings from mowing operations and dispose legally offsite.

C. Edge beds and lawn perimeters every two weeks, after establishment.

D. Feed with Webfoot Turf Treat 15-5-10 or approved equal, applying equivalent of four pounds of actual nitrogen per season in a minimum of four applications annually.

E. Apply herbicide weed control by licensed applicator sufficient to control invasive broadleaf weeds and grasses.

3.4 WATER QUALITY FACILITY AREA

A. Do not mow Water Quality Facility areas.

B. Do not apply weed control measures in water quality facility areas.

C. Monitor run-off conditions in water quality facility; notify Owner of drainage or erosion problems.

3.5 NON-IRRIGATED SEEDED AREAS

A. Mow or flail mow areas once monthly.

B. Until seeded areas are accepted start water application as soon as season requires. Apply water in sufficient quantities and at sufficient intervals to maintain seeded areas in good color and health. Do not allow surface run-off. Cease watering operations when seasonal rains provide ample water to maintain seeded areas.

C. Do not apply weed control measures in seeded areas.

D. Re-Seed per original specifications in areas not showing acceptable germination.

3.6 PEDESTRIAN AREAS

A. Police and sweep pedestrian walkways to maintain clean, safe surfaces, remove accumulated clippings and plant debris from walkways and entrances. Clean all paved surfaces soiled by landscape maintenance operations.

3.7 NATIVE PLANTING MAINTENANCE

A. Maintain native plantings and seeded areas on an 'as-needed basis' for a period of three years after written approval, per the unit cost bid and included in the contract documents, and per the following task schedule:

1. First Year:

   a. After the site is planted and written approval(s) for plantings has been issued, the Owner's Representative shall conduct weekly visits for the two months after planting, to monitor conditions. The Owner's Representative shall identify detrimental site conditions and notify the Contractor of such conditions. The contractor shall respond immediately to correct such conditions on a 'time and material' basis.
   b. Each month thereafter, the Contractor shall visit the site once monthly to monitor plantings for the balance of the first year.
   c. Maintenance tasks shall consider, but not be limited to the repair and/or improvement of the following concerns and conditions:

      1) Foliage condition.
      2) Irrigation applications: per specifications
      3) Survivability of plants and seeding.
      4) Animal and fowl.
      5) Water levels effects: sufficiency, period of inundation, erosion or washing.
      6) Germination of seeded areas.
      7) Weed control of invasive plan species. Removal of weed debris and seed sources.
      8) Detrimental surface conditions: Erosion, slumping, etc.
      9) Vandalisim.
      10) Litter and extraneous debris removal.

2. Second Year:

   a. Continue monthly maintenance tasks outlined in first year. Analysis of site and reports shall be consistent with first year methodology.

3.8 WEED ERADICATION

A. Weed Eradication: Shall include eradication by herbicide and non-herbicide methods. Eradication program shall include and is not limited to control of the following noxious species:

Cirsium arvense (Canadian Thistle)
Convolvulus spp. (Morning Glory)
Cytisus scoparus (Scotch Broom)
Dipsacus sylvestris (Common Teasel)
Eichornia crassipes (Water Hyacinth)
Festuca arundinaceae (Tall Fescue)
Hedera helix (English Ivy)
Holcus lanatus (Velvet Grass)
Lolium spp. (Rye Grasses)
Lotus corniculatus (Bird's Foot Trefoil)
Lythrium salicaria (Purple Loose Strife)
Melilotus spp. (Sweet Clover)
Myriophyllum spicatum (Eurasian Milfoil)

Phalaris arundinaceae (Reed Canary Grass)
Rubus discolor (Himalayan Blackberry)
Solanum spp. (Nightshade)
Trifolium spp. (Clovers)
Vicia spp. (Vetches)

Herbicide application shall be by manual 'spot spraying', wicking, or backpack methods per manufacturer's specifications. Herbicide in watershed or waterway areas shall be subject to approval and be strictly applied by manufacturer's specifications.

B. Selective hand removal by non-herbicide methods shall be utilized if herbicide application threatens native plantings. All native plantings indicating damage by herbicide application shall be replaced immediately at no additional cost to the Owner.

C. Protect the site and watershed at all times from erosion and siltation. Utilize all approved erosion control methods to contain and mitigate erosion. The Contractor shall inspect the site at sufficient intervals throughout the maintenance monitoring program, during wet periods of weather to identify potential erosion problems which shall be brought to the attention of the Owner's Representative immediately. Replace plant and seeding material per directives of the Owner's Representative, damaged by erosion per the original planting and seeded specifications.

3.9 IRRIGATION SYSTEM INSPETION AND MAINTENANCE

A. The Contractor shall irrigate to maintain all plantings in a healthy, thriving condition.

B. Start irrigation when plants require supplemental water due to dry weather, depleting available soil moisture.

C. Flush and winterize system by November 1, or earlier if weather exhibits threat of freezing. Verify that system is free of water in all components subject to freeze damage.

D. Provide yearly backflow prevention inspections and certificates to Owner's representative, as required by code.

E. Adjust nozzles, heads, valves, and controller operation to provide a consistent water application avoiding over-saturation or under watering throughout native planting areas.

F. Notify Owner's representative of system inadequacies that cannot be addressed by adjustment.

3.10 MAINTENANE SCHEDULE

PLANT MAINTENANCE SCHEDULE												
Tasks (frequency of tasks per month)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tree & Shrub Care			x									
(pruning, mulching, fertilizing)												
Replace Plants			x									
Weed Management prior to Monitoring									x			
Non-chemical Weeding		x	x	x	x	x	x	x	x	x	x	x
Trash Removal		x	x	x	x	x	x	x	x	x	x	x
Insect, Disease, Rodent Control			x									
Watering					x	x	x	x	x			
Monitor Irrigation Controller(s)					x			x				
Start/Stop Irrigation System					x					x		
(inspect for best operation in May)												
(winterize per specs)												

END OF SECTION

SECTION 33 31 00 – SANITARY SEWER PIPING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Applicable sections of the current Oregon Plumbing Specialty Code and Washington County Construction Standards.

C. All work shall be done in accordance with these specifications and in conformity with the plans.

D. Related sections:

1. Section 31 23 17 “Trenching”

2. Section 33 39 00 “Sanitary Sewer Structures”

1.2 SUMMARY

A. This section specifies requirements for sanitary sewer pipe for a gravity flow sewerage system.

1.3 SUBMITTALS

A. Product Data.

1.4 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other marking or specified testing agency.

B. Comply with NSF/ANSI 14, “Plastic Piping System Components and Related Materials,” for plastic piping components. Include marking with “NSF-drain” for plastic drain piping and “NSF-sewer for plastic sewer piping.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic pipe and fittings in direct sunlight.

B. Protect pipe, pipe fittings and seals from dirt and damage.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Sewer Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of sanitary sewer service.

2. Do not proceed with interruption of sanitary sewer service Owner’s written permission.

PART 2 PRODUCTS

2.1 PUBLIC SANITARY SEWER PIPE

A. Public Sanitary Sewer Pipe shall conform to Washington County Construction Standards.

2.2 SANITARY SEWER PIPING 4 INCH AND LARGER WITH GREATER THAN 3 FEET OF COVER, BEYOND 5 FEET OF THE BUILDING

A. PVC Pipe and Fittings

1. Shall be American Manufactured.

2. Pipe: Shall conform to the requirements of ASTM D3034, SDR 35.

3. Fittings: All fitting shall be of the same materials as the pipe unless otherwise approved. Conform to the requirements of ASTM D3034, PVC.

4. Gaskets: Shall conform to the requirements of ASTM F 477, elastomeric seals and ASTM 3212.

B. ABS (Acrylonitrile Butadiene Styrene) Pipe and Fittings

1. Shall be American Manufactured.

C. Cast Iron Pipe and Fittings

D. Shall be American Manufactured.

2.3 SANITARY SEWER PIPING 4 INCH AND LARGER WITH 3 FEET OR LESS OF COVER, BEYOND 5 FEET OF THE BUILDING

A. Cast Iron Pipe and Fittings

1. Shall be American Manufactured.

B. C900 Pipe and Fittings

1. All C900 Pipe and Fittings shall conform to the requirements of ASTM C-900 D-1784.

2. Shall be American Manufactured.

2.4 SANITARY SEWER PIPING WITHIN 5 FEET OF THE BUILDING

A. PVC DWV, Solid-Wall PVC Pipe shall conform to the requirements of ASTM D 2665, and plumbing code requirements.

PART 3 EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in section 312317 Trenching.

3.2 PIPING INSTALLATION

A. General location and arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout tack into account design considerations. Install pipe as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream, Install gaskets, seals, sleeves and couplings according to manufacturer's written instruction for using lubricants, cements, and other installation requirements.

C. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is complete. Place plug in end of incomplete piping at end of day and when work stops.

3.3 CONNECTIONS

A. Pothole prior to construction to verify location, size and depth of existing piping. Notify Engineer if location, size or depth of existing pipe is different than shown on the plans.

3.4 FIELD QUALITY CONTROL

A. Inspection and testing shall be per Washington County requirements.

3.5 CLEANING

A. Clean dirt and superfluous material from interior of piping prior to testing.

3.6 TESTING AND ACCEPTANCE

A. Testing shall be in conformance with Washington County requirements and Oregon Plumbing Specialty Code.

END OF SECTION

SECTION 33 39 00 – SANITARY SEWER STRUCTURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

B. Applicable sections of the current Oregon Plumbing Specialty Code and Washington County Design and Construction Standards.

C. Related sections

1. Section 31 23 17 “Trenching”

2. Section 33 31 00 “Sanitary Sewer Piping”

1.2 SUMMARY

A. This section specifies requirements for sanitary sewer structures for a gravity flow sewerage system.

1.3 SUBMITTALS

A. Product Data.

B. Shop Drawings for Manholes.

1.4 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other marking or specified testing agency.

B. Comply with NSF/ANSI 14, “Plastic Piping System Components and Related Materials,” for plastic piping components. Include marking with “NSF-drain” for plastic drain piping and “NSF-sewer for plastic sewer piping.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic pipe and fittings in direct sunlight.

B. Protect pipe, pipe fittings and seals from dirt and damage.

C. Handle manholes according to manufacturer’s written rigging instructions.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Sewer Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of sanitary sewer service.

2. Do not proceed with interruption of sanitary sewer service Owner’s written permission.

PART 2 PRODUCTS

2.1 POLYVINYL CHLORIDE PIPE (PVC)

A. Pipe and Fittings 4 inches to 15 inches shall be PVC SDR 35, conforming to ASTM D3034.

B. Joints: PVC pipe shall have integral wall bell and spigot push-on joint with elastomeric gaskets secured in place in the bell of the pipe. Elastomeric gaskets shall conform to ASTM D3212.

2.2 MANHOLES

A. Manhole components shall conform to Washington County Design and Construction Standards.

B. All steps within structures must comply with OSHA standards for fixed metal, individual rung ladders (OAR 437), and CWS, except that there shall be no more than 24 inches between the top of the casting and the rung of the top step.

C. All precast manhole riser sections shall conform to the requirements of ASTM C478.

D. All poured in place concrete shall have a 28 day strength of 3000 psi, and a slump of 2 inches to 2 inches.

E. All joints shall be sealed with preformed gaskets such as Kent-Seal #2, Ram-Neck, or an approved equal conforming to federal specifications SS-S00210.

F. All pipe connections to manhole shall be water tight.

G. Watertight / tamper proof manhole frame and cover shall be used in all easement and off street areas.

2.3 CLEANOUTS

A. Cleanouts shall conform to Project Drawings.

PART 3 EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in section 312317 Trenching.

3.2 MANHOLE INSTALLATION

A. Install precast concrete manhole sections with sealants according to ASTM C891 and Washington County Standards.

3.3 CLEANOUT INSTALLATION

A. General: install cleanout complete with appurtenances and accessories indicated, and in conformance with Washington County.

B. Install cleanouts where indicated on the drawings and per Oregon Plumbing Specialty Code.

3.4 CONNECTIONS

A. Pothole prior to construction to verify location, size and depth of existing piping. Notify Engineer if location, size or depth of existing pipe is different than shown on the plans.

3.5 FIELD QUALITY CONTROL

A. Inspection and testing shall be per Washington County requirements.

3.6 CLEANING

A. Clean dirt and superfluous material from interior of piping prior to testing.

3.7 TESTING AND ACCEPTANCE

A. Testing shall be in conformance with Washington County requirements and Oregon Plumbing Specialty Code.

END OF SECTION

ASBESTOS ABATEMENT CONTRACTOR BID DOCUMENT AND SPECIFICATIONS

West Tualatin View Elementary School Sewer Replacement Project

8800 SW Leahy Road
Portland, OR 97225

Prepared for:

Beaverton School District

16550 SW Merlo Road
Beaverton, Oregon 97006

Submitted: March 6, 2021

Prepared By:

4105 SE International Way, Suite 505
Milwaukie, OR 97222
503.387.3251

TRC Project Number: **430813**

TABLE OF CONTENTS

Appendices

Figures

- Figure 1 – Asbestos Abatement Materials Location Map

Appendix A – LIMITED ASBESTOS SURVEY REPORT

BID FORM

1. Base Bid: Bid due date will be announced at the Job Walk

The undersigned, having examined the proposed contract documents titled: Asbestos Abatement Contractor Bid Document and Specifications for 8800 SW Leahy Road in Portland, Oregon 97225 (Project Site), dated March 6, 2021, and having visited the site and examined the conditions affecting the work, hereby proposes and agrees to furnish all labor, materials, equipment, permits, insurance, appliances and to perform operations necessary to complete the work as required by said proposed contract documents, for that portion of the work identified in Scope of Work as "Base Bid" for the stipulated sum of:

_____**DOLLARS ($_____**)

To be completed in _____working days (8 hr. shifts).

Unit Abatement Costs: Removal as ACM and disposal as applicable by regulations:

Material	**Unit**	**Unit Cost**
Thermal System Pipe Insulation (Elbows)	Each	$/ each:
Thermal System Pipe Insulation (Runs)	Linear Foot	$/ln. ft.:
Transite Pipe	Linear Foot	$/ln. ft.:
Gypsum Board and Joint Compound	Square Foot	$/sq. ft.:
Mobilization Cost Associated with Follow-up Abatement Services	Mobilization	$/Mob

BIDDER

by_____

Address_____

_____

Contractor License_____

License Type_____

Type of business entity:

_____

Individual partners or individuals of the firm:

_____
_____
_____

President of Corporation_____
Secretary of Corporation_____
Corporation is organized under laws of the State of _____
Bid dated this _____day of _____, 2021.

END OF BID FORM

ASBESTOS CONTAINING MATERIALS ABATEMENT SUMMARY OF WORK

The Work includes the abatement of Asbestos Containing Materials (ACM) at 8800 SW Leahy Road, Portland, Oregon in order to prepare the site for renovation. The scope of work includes abatement and proper disposal of the asbestos containing materials identified in this document.

Base Bid: The Asbestos Abatement Contractor shall furnish all labor, materials, services, insurance (specifically covering the handling, transportation of asbestos containing material (ACM) and equipment which is specified, shown, or reasonably implied for the following abatement work.

The removal and disposal as required by applicable regulations, of the following friable and non-friable asbestos containing materials identified in the Supplemental Asbestos Survey report prepared by TRC and dated February 26, 2021. The asbestos-containing materials to be abated and their general location(s) are as follows:

Asbestos Containing Materials

Description	Material Location(s)	Friable / non-Friable	Approximate Quantity
Pipe Insulation and Elbows	Crawl Spaces and within Wall/Ceiling Cavities	Friable	20 LF
Transite Pipe (Assumed)	Exterior	Non-Friable	600 LF
Gypsum Board and Joint Compound	Kitchen Ceiling	Non-Friable	180 SF

ASBESTOS

PART 1 GENERAL - ASBESTOS

1.01 SCOPE OF WORK

A. The asbestos abatement and disturbance work related to this Project will consist of the removal and disposal of asbestos containing materials (ACM) and presumed asbestos containing materials (PACM) within portions of West Tualatin View Elementary School located at 8800 SW Leahy Road in Portland, Oregon 97225 as part of a planned renovation project. This section is intended to provide instruction for requirements in connection with asbestos abatement or disturbance and is complementary to the other contract documents, which apply to this section by reference.

B. For Work described in this Section, the Abatement Contractor (Contractor) shall furnish all labor, materials, equipment, tools, and any other resources necessary to complete the work in accordance with regulatory requirements and project contract documents, using best available technology and industry standard methods and procedures. The work shall include but not be limited to the removal and proper disposal of ACM and/or presumed ACM (PACM) materials as described below:

Asbestos Containing Materials

Description	Material Location(s)	Friable / non-Friable	Approximate Quantity
Pipe Insulation and Elbows	Crawl Spaces and within Wall/Ceiling Cavities	Friable	20 LF
Transite Pipe (Assumed)	Exterior	Non-Friable	600 LF
Gypsum Board and Joint Compound System	Kitchen Ceiling	Non-Friable	180 SF

Please refer to Appendix A, Limited Asbestos Survey Report dated, February 26, 2021, for additional and more detailed information on the asbestos materials present at the Site.

Estimated quantities are provided as an approximate guide to the Contractor. The material quantities listed above are approximations and TRC is not responsible for the accuracy of the quantities and measurements provided. The Contractor shall field verify material quantities, locations, and make themselves cognizant of existing field conditions prior to submitting bids for the work of this specification. Submitting of bids for work described herein shall take into consideration and utilize the Contractor's field measurements of materials and observations of the conditions verified on site.

C. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor, equipment, and materials necessary to perform the Work.

D. All Work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent requirement shall apply.

E. Working hours shall be as required and approved by the Owner. ERM abatement activities including, but not limited to, work area preparation, gross removal activities, waste clean-up activities, waste removal, etc. may need to be performed during the specified time period by the Owner. The Contractor shall coordinate and schedule all Work with the facility and Owner's representative.

1.02 PERMITS AND COMPLIANCE

A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to Work practices, protection of Workers, authorized visitors to the site, persons, and property adjacent to the Work.

B. Perform asbestos related Work in accordance with Federal, State and Local Regulations (U.S. Environmental Protection Agency (EPA) 40 CFR 61, Occupational Health and Safety (OSHA) 29 CFR 1926 and Oregon Department of Environmental Quality (ODEQ)). Where more stringent requirements are specified, the Contractor shall adhere to the more stringent requirements.

1.03 SUBMITTALS

A. Pre-Work Submittals: Within 15 calendar days prior to the pre-construction conference, the Contractor shall submit copies of the documents listed below to Beaverton School District's Environmental Consultant for review and approval prior to the commencement of asbestos abatement activities:

1. Asbestos Removal Work Plan which includes the means, methods and protective measures which will be used to comply with all applicable Federal, State and Local rules and regulations. This plan shall be completed and signed by an EPA accredited Asbestos Project Designer.

2. Current worker and contractor/supervisor training records.

3. Insurance Certificates

   a. All Certificates of Insurance must name Beaverton School District as additional insured and will comply with entities noted in the contract as additional insured. These include the following:

      - Asbestos/Pollution Liability - $1,000,000;
      - Auto Liability - $1,000,000 per each vehicle on site;
      - Workman's Compensation and Employers Liability - $500,000 per accident;
      - Commercial General Liability - $1,000,000 per occurrence with $2,000,000 general aggregate per project
      - True Umbrella Policy - $5,000,000

   b. All insurance will be written through companies having an A.N. rating of at least A VII or with such other companies as may reasonably be approved by Owner. All such liability insurance maintained by the Contractor or any subcontractor will include the condition that it is primary and that any such insurance maintained by Owner or any other additional insured is excess and non-contributory.

B. On-Site Submittals: Refer to Part 3.01.C for all submittals, documentation, and postings required to be maintained on-site during abatement activities.

C. Project Close-out Submittals: Within 30 business days of the completion of the project, the Contractor shall submit digital and hard copies of the documents listed below. The documents shall be transmitted to the Environmental Consultant for review and approval prior to the Contractor's final payment.

1. Originals of all waste disposal manifests, seals, and disposal logs.

2. OSHA personal air monitoring results conducted during the Work.

3. Daily progress log describing in detail the areas of work and ACM/PACM affected by the day's work activities and regulated work area entry/exit logs

4. Project Notifications

5. Safety Meeting Logs

6. Insurance Certificates

7. Workers Certifications and Medical Monitoring

8. Contractors Licenses

1.04 PRE-CONSTRUCTION CONFERENCE

A. Prior to start of preparatory Work under this Contract, the Contractor shall attend a pre-construction conference attended by Owner, Architect and Environmental Consultant.

B. Agenda for this conference shall include but not necessarily be limited to:

1. Contractor's Asbestos Removal Work Plan

2. Environmental Consultant's duties and functions

3. Contractor's Work procedures including:

   a. Methods of job site preparation and removal methods

   b. Respiratory protection

   c. Disposal procedures

   d. Cleanup procedures

   e. Fire exits and emergency procedures

4. Contractor’s required pre-work and on-site submittals, documentation, and postings

5. Contractor's plan for twenty-four (24) hour project security both for prevention of theft and for barring entry of unauthorized personnel into work areas

6. Temporary utilities

7. Storage of removed asbestos containing materials

8. Waste disposal requirements and procedures, including waste manifest and container seals

C. In conjunction with the conference the Contractor shall accompany the Owner, Architect and Environmental Consultant on a pre-construction walk-through of the Project site.

1.05 APPLICABLE STANDARDS AND REGULATIONS

All asbestos related work must be performed in accordance with EPA and OSHA regulations (40 CFR 61, 29 CFR 1926) and Oregon Department of Environmental Quality. Where more stringent requirements are specified, the Contractor shall adhere to the more stringent requirements.

1.06 NOTICES

A. The Contractor shall provide notification of intent to commence asbestos abatement activities at least ten (10) working days prior to beginning abatement activities. Written notification shall be sent to the Oregon Department of Environmental Quality Department (DEQ).

B. The Contractor shall maintain copies of notices, and provide proof of delivery and receipt.

C. The Contractor shall be responsible for maintaining current project filings with regulatory agencies for the duration of the project.

1.07 ENVIRONMENTAL CONSULTANT

A. The Owner shall engage the services of an Environmental Consultant (the Consultant) who shall serve as the Owner's Representative in regard to the performance of the asbestos abatement Project and provide direction as required throughout the entire abatement Project period.

B. The Contractor is required to ensure cooperation of its personnel with the Consultant for the air sampling and Project monitoring functions described in this section. The Contractor shall comply with all direction given by the Consultant during the course of the Project.

C. The Consultant shall review and approve all Contractor submittals.

D. The Consultant shall staff the Project with a trained and certified person(s) to act on the Owner's behalf at the job site.

1. The consultant's representative shall be on-site at all times the Contractor is on-site. The Contractor shall not be permitted to conduct any Work unless the consultant's representative is on-site (except for inspection of barriers and negative air system during non-working days).

2. The consultant's representative shall have the authority to direct the actions of the Contractor verbally and in writing to ensure compliance with the Project documents and all regulations. The consultant's representative shall have the authority to Stop Work when gross Work practice deficiencies or unsafe practices are observed, or when ambient fiber concentrations outside the removal area exceed 0.01 f/cc or background level.

   a. Such Stop Work order(s) shall be effective immediately and remain in effect until corrective measures have been taken and the situation has been corrected.

   b. Standby time required to resolve the situation shall be at the Contractor's expense.

3. The consultant's representative shall provide the following services:

   a. Inspection of the Contractor's Work, practices, and procedures, including temporary protection requirements, for compliance with all regulations and Project specifications including provisions required by Variances, the Work Place Safety Plan and Asbestos Work Permit.

   b. Provide abatement Project air sampling as required by applicable regulations and the Owner. Sampling will include background, work area preparation, asbestos handling, final cleaning and clearance air sampling.

   c. Verify daily that all Workers used in the performance of the Project are certified by the appropriate regulatory agency.

   d. Monitor the progress of the Contractor's Work, and report any deviations from the schedule to the Owner.

   e. Monitor, verify, and document all waste load-out operations.

   f. Verify that the Contractor is performing personal air monitoring daily, and that results are being returned and posted at the site as required.

   g. The consultant's representative shall maintain a log on site that documents all project related and Consultant and Contractor actions, activities, and occurrences.

4. The following minimum inspections shall be conducted by the consultant's representative. Additional inspections shall be conducted as required by Project conditions. Progression from one phase of Work to the next by the Contractor is only permitted with the written approval of the consultant's representative.

   a. Pre-Construction Inspection: The purpose of this inspection is to verify the existing conditions of the Work Areas and to document these conditions.

   b. Pre-Commencement Inspection: The purpose of this inspection is to verify the integrity of each containment system prior to disturbance of any asbestos containing material. This inspection shall take place only after the Work Area is fully prepped for removal.

   c. Work Inspections: The purpose of this inspection is to monitor the Work practices and procedures employed on the Project and to monitor the continued integrity of the containment system. Inspections within the removal areas shall be conducted by the consultant's representative during all preparation, removal, and cleaning activities at least twice every Work shift. Additional inspections shall be conducted as warranted.

   d. Pre-Encapsulation Inspection: The purpose of this inspection is to ensure the complete removal of ACM and/or PACM, from all surfaces in the Work Area prior to encapsulation.

e. Visual Clearance Inspection: The purpose of this inspection is to verify that: all materials in the scope of work have been properly removed; no visible asbestos debris/residue remains; no pools of liquid or condensation remains; and all required cleanings are complete. This inspection shall be conducted before final air clearance testing.

f. Post-Clearance Inspection: The purpose of this inspection is to ensure the complete removal of ACM, including debris, from the Work Area after satisfactory final clearance sampling and removal of all isolation and critical barriers and equipment from the Work Area.

E. The Consultant shall provide abatement Project air sampling and analysis as required by applicable regulations. Sampling will include background, work area preparation, asbestos handling, and final cleaning and clearance air sampling.

1. Unless otherwise required by applicable regulations, the Consultant shall have samples analyzed by Phase Contrast Microscopy (PCM) for daily area and final clearance air monitoring during asbestos removal or disturbance work. Results shall be available at the Project site within 2 hours of completion of sampling. Should TEM analysis be requested/required, results will be provided within 24 hours of receipt of samples by the accredited laboratory.

2. Samples shall be collected as required by applicable regulations and these specifications.

3. If the air sampling during any phase of the abatement project reveals airborne fiber levels at or above .01 fibers/cc or the established background level, whichever is greater, outside the regulated Work Area, Work shall stop immediately and corrective measures required by applicable regulations shall be initiated. Notify all employers and occupants in adjacent areas. The Contractor shall bear the burden of any and all costs incurred by this delay.

4. At the completion of each abatement phase, the Consultant shall prepare an interim certificate of completion for project records.

1.08 PERSONAL AIR SAMPLING

A. The Contractor shall perform appropriate personal air monitoring in accordance with 29 CFR 1926.1101, every Work shift in each Work Area during which abatement activities occur in order to determine that appropriate respiratory protection is being worn and utilized.

B. The Contractor shall conduct air sampling that is representative of both the 8-hour time weighted average and 30-minute short-term exposures to indicate compliance with the permissible exposure and excursion limits.

C. The Contractor's laboratory analysis of air samples shall be conducted by laboratory accredited by the American Industrial Hygiene Association (AIHA) for PCM analysis.

D. Results of personnel air sample analyses shall be available within 5 business days of sample collection.

1.09 PROJECT SUPERVISOR

A. The Contractor shall designate a full-time Project Supervisor who shall meet the following qualifications:

1. The Project Supervisor shall hold an Asbestos Hazard Emergency Response Act (AHERA) certification as an Asbestos Contractor/Supervisor.

2. The Project Supervisor shall meet the requirements of a "Competent Person" as defined by OSHA 1926.1101 and shall have a minimum of one year experience as a supervisor.

3. The Project Supervisor must be able to speak, read, and write English fluently, as well as communicate in the primary language of the Workers and immediate community.

B. The Project Supervisor shall be responsible for the performance of the Work and shall represent the Contractor in all respects at the Project site. The Supervisor shall be the primary point of contact for the Asbestos Project Monitor.

1.10 RESPIRATORY PROTECTION

A. Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

B. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134 and 29 CFR 1926.1101.

C. A storage area for respirators shall be provided by the Contractor in the clean room side of the personnel decontamination enclosure where they will be kept in a clean environment.

D. The Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the work day. Filters used with negative pressure air purifying respirators shall be changed regularly to comply with OSHA.

E. Any visitor, Worker, or supervisor found in the Work Area not wearing the required respiratory protection shall be removed from the Project site.

1.11 DELIVERY AND STORAGE

A. Store all materials at the job site in a suitable and designated area.

1. Store materials subject to deterioration or damage away from wet or damp surfaces and under cover.

2. Protect materials from unintended contamination and theft.

3. Storage areas shall be kept clean and organized.

B. Remove damaged or deteriorated materials from the job site. Materials contaminated with asbestos shall be disposed of as asbestos debris.

1.12 TEMPORARY UTILITIES

A. Shut down and lock out all electrical power to the asbestos Work Areas.

B. Provide temporary electric service with Ground Fault Circuit Interrupters (GFCI) for all electric requirements within the asbestos Work Area.

C. Provide temporary lighting with "weatherproof" fixtures for all Work Areas.

D. Utilize domestic water service, if available, from Owner's existing system. Provide hot water heaters with sufficient capacity to meet Project demands.

PART 2 PRODUCTS

2.01 MATERIALS

A. All materials shall be delivered to the job site in the original packages, containers, or bundles bearing the name of the manufacturer, the brand name and product technical description, with Safety Data Sheets (SDSs) as applicable.

B. No damaged or deteriorating materials shall be used. If material becomes contaminated the material shall be decontaminated or disposed of as asbestos-containing waste material. The cost to decontaminate and dispose of this material shall be at the expense of the Contractor.

C. Fire retardant polyethylene sheet shall be in roll size to minimize the frequency of joints, with factory label indicating no less than six (6) mil thickness.

D. Polyethylene disposable bags shall be no less than six (6) mils thick.

E. A commercial grade duct tape (or equivalent) capable of sealing joints in adjacent polyethylene sheets and for the attachment of polyethylene sheets to finished or unfinished surfaces must be capable of adhering under both dry and wet conditions.

F. Any planking, bracing, shoring, barricades and/or temporary sheet piling, necessary to appropriately perform work activities shall conform to all applicable federal, state and local regulations.

2.02 TOOLS AND EQUIPMENT

The Contractor shall provide tools and equipment that are suitable for asbestos related activities and in good working order.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. The following submittals, documentation, and postings shall be maintained on-site by the Contractor during abatement activities:

1. Asbestos worker and contractor/supervisor certification cards for each person employed in the removal, handling, or disturbance of asbestos
2. Daily OSHA personal air monitoring results
3. Project documents (specifications and drawings)
4. Applicable regulations
5. Safety Data Sheets of supplies/chemicals used on the Project
6. Approved Abatement Work Plan
7. List of emergency telephone numbers
8. Daily Project Log

B. The following documentation shall be maintained on-site by TRC Environmental Corp. during abatement activities:

1. Air sample results
2. Project Monitor Daily Log
3. Asbestos Survey Report
4. A copy of ASTM Standard E1368 “Standard Practice for Visual Inspection of Asbestos Abatement Projects”

C. Install emergency exit signage and fire extinguishers throughout the Work Area in accordance with OSHA Construction Industry Standards.

D. Use the following engineering controls and work practices for all asbestos abatement operations, regardless of measured exposure levels:

1. Vacuum cleaners equipped with HEPA filters to collect all asbestos-containing dust and debris
2. Wet methods to control exposures during asbestos removal and clean-up, except where proven to be infeasible
3. Prompt clean-up and disposal of asbestos-contaminated wastes and debris in leak-proof containers

E. Do not use any of the following equipment or work practices during asbestos abatement operations, regardless of measured exposure levels:

1. High-speed abrasive disc saws not equipped with point-of-cut HEPA ventilation or HEPA filtered exhaust air enclosures

2. Blowing with compressed air to remove asbestos-containing materials

3. Dry sweeping, shoveling, or other dry methods to clean up asbestos-containing dust and debris

4. Employee rotation as a means of reducing employee exposure to asbestos

F. Protect adjacent areas, materials and surfaces from damage due to demolition operations, including but not necessarily limited to the following:

1. Water damage

2. Dirt, dust and debris

3. Abrasion

4. Cuts and scratches

5. Holes from fasteners for temporary barriers

3.02 PROTECTIVE CLOTHING

A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, gloves and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber for comfort, but shall not be used alone. Make sleeves secure at the wrists and make foot coverings secure at the ankles by the use of tape, or provide disposable coverings with elastic wrists or tops.

B. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Work Area.

3.03 SIGNS AND LABELS

A. Provide warning signs and barrier tapes at all approaches to asbestos Work Areas. Locate signs at such distance that personnel may read the sign and take the necessary protective steps required before entering the area.

1. Provide danger signs in vertical format conforming to 29 CFR 1926.1101, minimum 20" x 14" displaying the following legend.

ASBESTOS CANCER AND LUNG DISEASE
HAZARD
AUTHORIZED PERSONNEL ONLY

RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA

2. Provide 3" wide OSHA-Approved barrier tape printed with black lettered, "DANGER ASBESTOS REMOVAL". Locate barrier tape across all corridors, entrances and access routes to asbestos Work Area. Install tape 3' to 4' Above Finished Floor AFF.

B. Provide asbestos danger labels affixed to all asbestos materials, scrap, waste, debris and other products contaminated with asbestos.

1. Provide asbestos danger labels of sufficient size to be clearly legible, displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

2. Provide the following asbestos labels, of sufficient size to be clearly legible, for display on waste containers (bags or drums) which will be used to transport asbestos contaminated material in accordance with United States Department of Transportation 49 CFR Parts 171 and 172: (Note: Include “RQ” for friable asbestos waste only.)

RQ, (WASTE) ASBESTOS, 9, NA2212, PGIII

3. Generator identification information shall be affixed to each waste container indicating the following printed in indelible ink:
Generator Name
Facility Name
Facility Address
EPA Generator ID Number

3.04 FRIABLE ACM REMOVAL BY FULL ENCLOSURE METHOD

A. Preparation of the Work Area

1. Install critical barriers over each opening into the regulated area. The following requirements are in addition to, not in lieu of, other indicated surface and object protection requirements:

a. Seal each opening between the work area and adjacent areas with not less than 2 layers of 6-mil polyethylene sheeting. Use an expanding-polyurethane foam gun to seal areas with large numbers of pipes, conduits and beams. Openings include, but are not necessarily limited to, windows, skylights, doorways, elevator hoist way openings, corridor entrances, drains, ducts, grills, grates, and diffusers.

b. Seal intake and exhaust vents and duct seams within the regulated area with not less than 2 layers of 6-mil polyethylene sheeting.

2. HVAC System Shutdown: Owner's maintenance personnel will shut down heating, cooling, and air conditioning systems when necessary. Coordinate scheduling with Owner's personnel.

3. Protection of Surfaces and Objects: The following requirements are in addition to, not in lieu of, indicated work area sealing requirements. Cover the following surfaces and objects as follows:

    a. Protect all surfaces beneath all removal activity. Remove moveable objects from the work area, and cover fixed objects with impermeable drop cloths or plastic sheeting with edges securely sealed with tape.

    b. Provide clean, fresh air to mechanical equipment, where required to maintain proper performance of equipment.

    c. Fully pre-clean all covered surfaces with amended water and a HEPA vacuum.

    d. Cover walls with not less than 2 layers of 6-mil polyethylene sheeting. Construct free-standing enclosure walls of not less than 6-mil polyethylene sheeting, with supports spaced not more than 3 feet on center.

    e. Cover floors with not less than 2 layers of 6-mil polyethylene sheeting. Avoid seams where possible. If seams are necessary, overlap not less than 12 inches and tape joints. Extend sheeting 12 inches up the side walls leaving no seams at the wall and floor joint. Immediately repair punctures and leaks, and clean up seepage.

4. Cleaning: Do not use cleaning methods that raise dust, such as sweeping or using vacuum cleaners not equipped with HEPA filters. Do not disturb asbestos materials during pre-cleaning phases. Treat water removed from the enclosure as asbestos contaminated waste. Fully seal floor drains.

5. Deactivate or install ground-fault circuit interrupters on each electrical circuit within the enclosure.

6. Construct a three-chambered decontamination facility that is adjacent to and connected to the regulated area, and that consists of a dirty room, a shower room, and a clean room in series. Construct decontamination facilities that are exposed to weather of lumber and exterior grade plywood. Secure the facility when not in use.

    a. Supply the equipment room with properly labeled, impermeable bags and containers for the containment and disposal of contaminated protective equipment.

    b. Construct showers that comply with the requirements of 29 CFR 1910.141 (d) (3), with the shower room adjacent to both the equipment room and the clean room. Filter water waste and shower water through a 5 micron filter, or remove water from site as asbestos waste.

    c. Equip the clean room with a locker or appropriate storage container for each employee.

7. Employee Decontamination Facilities

    a. Access the work area only through an approved decontamination system. Lock or block other entrances. Seal emergency exits (for use during a fire or accident) with polyethylene sheeting and tape.

    b. Seal the waste pass-out, except during the removal of asbestos waste from the enclosure.

    c. Entrance to The Regulated Area: Employees shall enter the decontamination area through the clean room, remove and store clothing, and put on protective clothing and respiratory protection before passing through to the equipment room.

    d. Exit from The Regulated Area: Employees shall exit the regulated area by removing gross contamination and debris from their protective clothing. The clothing shall be removed and disposed of in the equipment room into labeled impermeable bags or containers. Employees shall then shower and enter the clean room before changing into street clothes.

8. Local Exhaust Ventilation: Maintain portable air filtration units with a HEPA filter in use during asbestos abatement operations requiring enclosures. Units shall conform to OSHA Standard 1926.1101, Appendix F, and shall be designed in accordance with 40 CFR 61, Subpart M, Section 61.153.

    a. Exhaust directly to building exterior. Provide a backup portable air filtration unit at each removal enclosure. Startup ventilation units prior to initiating asbestos removal operations and run until the Owner's consultant has approved their shut-down after cleaning, visual inspection, clearance sampling and tear-down.

    b. Direct air movement within the enclosure away from the employees' work area and toward the air filtration device.

    c. Provide not less than 4 air changes per hour within the enclosure.

    d. Within the enclosure, through the period of its use, maintain a pressure differential of not less than minus 0.02 water gage with respect to ambient conditions outside the enclosure. Provide continuous measurement of the pressure differential at each negative pressure enclosure.

9. Visually inspect the enclosure for breeches and smoke-test for leaks before work begins, and before the start of each work shift. Make all modifications to the enclosure prior to starting removal work.

B. Work Practices

1. Immediately preceding asbestos removal, apply a fine mist of water to the asbestos materials and the surrounding area. Keep surrounding areas wet by spraying periodically with amended water. Maintain a high humidity environment to assist in fiber settling.

2. Remove asbestos material using two-person teams, on staging platforms, if necessary.

3. Remove the wet asbestos material as intact sections or components. Carefully lower the material to the floor or place directly into container. Never drop or throw asbestos material on the floor.

4. At working heights between 15 and 50 feet above the floor, place removed asbestos materials in containers at the elevated levels and lower to floor, or place onto inclined chutes or scaffolding for subsequent collection and placement into containers. Clean all debris at the completion of each workday.

5. Once the asbestos material is at ground level, pack in labeled 6-mil polyethylene bags, wet and, if appropriate, hold in drums prior to starting the next section.

6. Use 2 sealed and labeled 6-mil thick bags for storage and transportation of asbestos waste. Standing water shall be in each bag

7. Wrap large components removed intact in two layers of 6-mil polyethylene sheeting, label, and secure with tape for transport to the landfill. Comply with all wetting requirements.

8. Treat wires, hangers, steel bands, nails, screws, metal lath, tin sheeting, and similar sharp objects removed with asbestos material as asbestos waste. Place in drums for disposal.

9. Label containerized asbestos waste in accordance with OSHA, EPA, and Department of Transportation regulations, as follows:

   a. Label each container with OSHA label that contains the following information:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG
DISEASE HAZARD

   b. Label each container with Owner's and Asbestos Abatement Firm's names and addresses as required by NESHAP.

   c. Label each container with Class 9 Label required by DOT and identify waste as "RQ, Asbestos NA 2212."

10. Remove containerized asbestos waste daily from site, or store on site in a locked or secured location until ready for final disposal. Obtain approval of Owner's Representative of the location of disposal containers. Outdoor waste containers shall be fully enclosed and locked. Mark vehicles used to transport waste during the loading and unloading of asbestos waste with a visible sign, as required by NESHAP.

3.05 REMOVAL OF NON-FRIABLE ASBESTOS-CONTAINING MATERIALS

A. Removal of Vinyl Floor Tile (unless rendered Friable)

1. Prior to removal, critical barriers shall be placed over openings to the regulated area.

2. Prior to removal, clean floors of dirt and debris with vacuums equipped with HEPA filter.

3. Sanding the floor or related backing is not permitted.

4. Mechanical chipping of vinyl floor tile is prohibited, except when performed in a negative pressure enclosure.

5. Thoroughly wet vinyl floor tile with water. Use a slip scraper or equivalent to loosen the floor tile from the floor. Remove the floor tile in an intact state. Keep the floor tile wet throughout the removal and cleanup.

6. Place the resilient flooring material and debris in an asbestos disposal bag. Seal the bag and place it in a properly labeled drum. Comply with the disposal and labeling requirements of this document.

B. Asbestos Mastic Removal

1. Prior to removal, critical barriers shall be placed over openings to the regulated area.

2. Clean the floor of all debris using a HEPA vacuum, wet sweeping, mopping or equivalent.

3. Remove as much mastic as possible using a Consultant approved solvent. Control odors and fumes with engineering controls.

4. Perform scraping of residual adhesive using wet methods.

5. After all debris is removed, thoroughly mop the floor and allow time to dry.

6. Properly dispose of all asbestos and solvent waste according to all applicable regulations, and comply with the disposal and labeling requirements of this Section.

C. Asbestos-Containing Siding and Transite Materials

1. Create a regulated work area and place impermeable drop cloths on surfaces beneath removal activity.

2. Cutting, abrading, or breaking material is not permitted.

3. Wet material with water prior to removal.

4. Carefully disassemble material such a manner as to prevent breakage.

5. Wrap and seal material in two layers 6-mil thick polyethylene, asbestos disposal bags, or equivalent. Seal bags or packages and properly label them with appropriate asbestos warning signs.

D. Non-Friable Asbestos Containing Exterior Sealant, Caulk, Putty and Window Glazing

1. Create a regulated work area and place impermeable drop cloths on surfaces beneath removal activity.

2. Any existing loose material shall be HEPA vacuumed prior to removal.

3. The material shall be thoroughly wetted prior to and during its removal.

4. The material should be removed as intact as possible. Manual methods shall be used.

5. Removed ACM shall be immediately bagged.

6. The removal of windows and other whole building components without disturbing the asbestos is encouraged.

7. If the material becomes friable during the abatement process, comply with the requirements for friable asbestos removal.

3.06 WORK AREA DECONTAMINATION AND CLEARANCE PROCEDURES

A. The Asbestos Abatement Contractor's representative, in presence of Owner's consultant, shall inspect the entire work area for asbestos.

B. If any suspect asbestos dust or debris is found, repeat final cleaning operation, until the visual inspection is satisfactory to the Owner's consultant.

C. After final visual clearance criteria have been achieved in the work areas, the Owner's consultant will notify the Abatement Contractor to encapsulate all walls, floors, ceilings, other exposed surfaces, and decontamination facilities.

D. Clearance air sampling will be completed by the Owner's consultant after the encapsulant has dried. Any costs associated with re-cleaning due to failed clearance results will be the sole responsibility of the Abatement Contractor. All clearance air samples shall be at or below 0.01 fibers per cubic centimeter as measured using Phase Contrast Microscopy (NIOSH 7400 method) or below 70 structures per square millimeter by Transmission Electron Microscopy (TEM) using the AHERA analytical method.

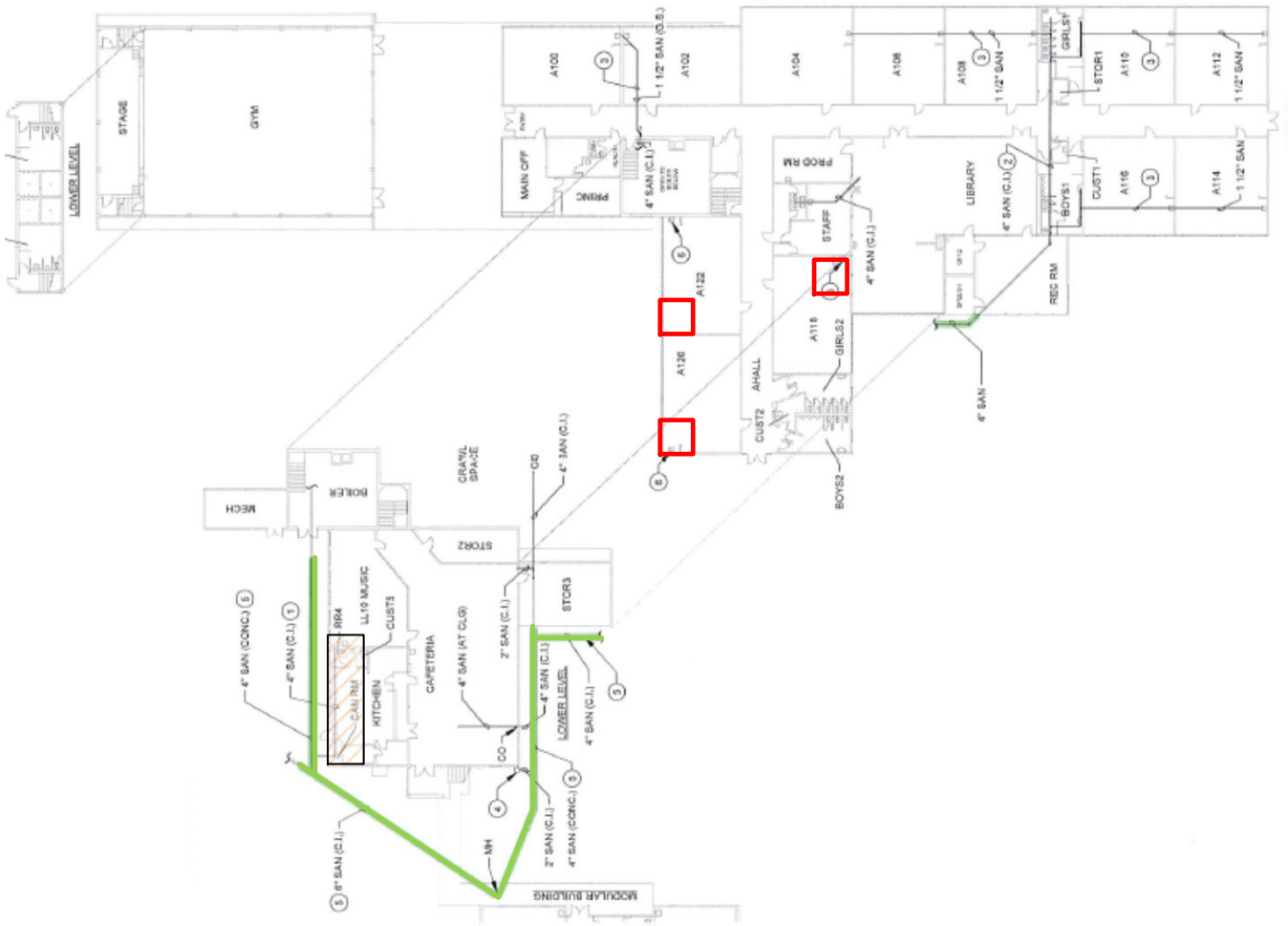
E. After abatement clearance is given by the Asbestos Project Monitor the Abatement Contractor may remove the containment, which shall be disposed of as ACM.

3.07 WASTE DISPOSAL

A. All waste will be transported and disposed of in compliance with DOT requirements and all applicable Federal, State and local regulations. Disposal must occur at an acceptable landfill accompanied by a waste manifest.

B. A copy of all waste manifests shall be given to Owner upon completion of the project.

FIGURES



LEGEND

- Asbestos-Containing Pipe Insulation between floor of Classrooms and ceiling of Cafeteria below.
- Assumed Asbestos-Containing Transite Pipe Location
- Assumed Asbestos-Containing Gypsum Board and Joint Compound

ABATEMENT SPECIFICATION
MATERIAL LOCATION DIAGRAM

WEST TUALATIN VIEW ELEMENTARY SCHOOL
SEWER REPLACEMENT PROJECT
8800 SW LEAHY ROAD
PORTLAND, OREGON 97225

TRC Project No.: 430813		Figure: 1
Drawn by: JS	Reviewed by: RAL	Date: March 2021

TRC
4105 SE International Way, Suite 505
Milwaukie, Oregon 97222
Phone: (503) 387-3251 Fax: (503) 908-1318

APPENDIX A

LIMITED ASBESTOS SURVEY REPORT
West Tualatin View Elementary School
8800 SW Leahy Road
Portland, Oregon 97225
Dated: February 26, 2021

LIMITED ASBESTOS SURVEY REPORT

West Tualatin View Elementary School Sewer Replacement Project

8800 SW Leahy Road
Beaverton, OR 97225

Prepared for:

Beaverton School District
16550 SW Merlo Road
Beaverton, OR 97006

Report Date: February 26, 2021

Prepared By:

4105 SE International Way, Suite 505, Milwaukie, OR 97222

TRC Project: 430813

TABLE OF CONTENTS

Appendices

EXECUTIVE SUMMARY

TRC Environmental Corporation (TRC) was contracted by the Beaverton School District to conduct a limited asbestos survey, including collection of bulk asbestos samples, laboratory analysis, and preparation of a report for West Tualatin View Elementary School located at 8800 SW Leahy Road, Beaverton, Oregon 97225. Mr. Jason Stone, Asbestos Hazard Emergency Response Act (AHERA) accredited Asbestos Building Inspector, performed the survey on February 18, 2021. The survey activities included the review of prior sampling documentation and reports provided by the District, inspection and assessment of accessible suspect building materials, collection of bulk samples of suspect asbestos containing building materials that had previously not been sampled, and submission of bulk samples for laboratory analysis. This survey was conducted in response to expected replacement of fire doors in the Library.

Asbestos Containing Materials

Asbestos was detected in the following materials sampled during this limited investigation:

BSD-West Tualatin View Elementary School			
Sample No.	**Materials / Areas**	**Material Location**	**Estimated Quantity**
WTVES-01A WTVES-01B WTVES-01C	Pipe Run Insulation, Black	A118 & A122	20 LF
WTVES-05A WTVES-05B WTVES-05C	4” Pipe Run Insulation, White	Crawl Space	1,500 LF
Assumed	Transite Pipe	Beneath Ground	600 LF

Three (3) of the six (6) materials assessed during this limited survey were identified as asbestos containing or assumed to contain asbestos. Asbestos-containing materials (ACM) are defined by the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA) and the State of Oregon Department of Environmental Quality (DEQ) as any material containing more than one percent (>1.0%) asbestos when analyzed using Polarized Light Microscopy (PLM) methods.

Additionally, any materials uncovered during renovation or demolition activities that are not addressed in this inspection report, or presumed asbestos containing materials (PACM), must be sampled by an accredited asbestos inspector prior to any disturbance, or they must be treated as asbestos containing (ACM).

INTRODUCTION

TRC Environmental Corporation (TRC) was contracted by the Beaverton School District to conduct a limited asbestos survey, including collection of bulk asbestos samples, laboratory analysis, and preparation of a report for West Tualatin View Elementary School located at 8800 SW Leahy Road, Beaverton, Oregon 97225. The survey activities were initiated on February 18, 2021, by Jason Stone, Asbestos Hazard Emergency Response Act (AHERA) accredited Asbestos Building Inspector and included the review of prior sampling documentation and reports as well as the inspection, assessment and bulk sampling of suspect asbestos containing building materials that had not previously been sampled in the work area. Sample locations are presented on the Sample Location Diagrams in Appendix A.

Mr. Jason Stone, AHERA accredited building inspector, conducted the survey inspection and sampling activities. Copies of training certificates and state licenses (where applicable) are presented in Appendix C, Inspector Certifications.

BACKGROUND

Asbestos Containing Materials

Occupational Safety and Health Administration (OSHA) defines asbestos-containing material (ACM), as any material containing more than one percent asbestos.

The Environmental Protection Agency (EPA) defines ACM as follows:

1. Friable asbestos-containing material (ACM), is defined by the Asbestos NESHAP, as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM), that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure.

2. Nonfriable ACM is any material containing more than one percent (1%) asbestos as determined using the PLM method that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. The EPA further defines two categories of nonfriable ACM:

    a. Category I (Cat I) - Category I nonfriable ACM is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product which contains more than one percent (1%) asbestos as determined using PLM according to the method specified in Appendix A, Subpart F, 40 CFR Part 763, and

    b. Category II (Cat II) - Category II nonfriable ACM is any material, excluding Category I nonfriable ACM, containing more than one percent (1%) asbestos as determined using PLM according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763 that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

3. Regulated Asbestos-Containing Material (RACM) is (a) friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

Asbestos Sampling Procedures

The survey was conducted in accordance with the sample collection protocols established in 40 CFR 763 (AHERA), 40 CFR 61 Subpart M (NESHAP). A summary of survey activities is provided below.

Survey activities began with visual observation of the project area to identify homogeneous areas of suspect ACM. A homogeneous area consists of building materials that appear similar throughout in terms of color and texture that does not extend to other buildings or floors. Visual assessments were conducted in accessible areas of the building. Building materials identified as glass, wood or metal were not considered suspect ACM.

A physical assessment of each homogeneous area of suspect ACM was conducted to assess the friability and condition of the materials. Friability was assessed by physically touching suspect materials.

Based on results of the visual observation, bulk samples of suspect ACM were collected in accordance with applicable Federal Local and State sampling protocols sampling protocols. Samples of suspect materials were collected in each homogeneous area. Bulk samples were collected using wet methods as applicable to reduce the potential for fiber release. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker.

All asbestos bulk samples were submitted under proper COC documentation to the laboratory. Bulk samples were analyzed by PLM utilizing the EPA's, Method for the Determination of Asbestos in Bulk Building Materials, EPA 600/M4-82-020. Analysis by PLM was performed by visual observation of the bulk sample and slides prepared of the bulk sample for microscopic examination and identification. The samples were analyzed for asbestos (Chrysotile, Amosite, Crocidolite, Anthophyllite, and Actinolite/Tremolite), fibrous non-asbestos constituents (mineral wool, cellulose, etc.) and non-fibrous constituents. Using a stereoscope, the microscopist visually estimated the relative amounts of each constituent by determining the estimated area of the asbestos compared with the area estimate of the total sample.

Laboratory Analysis

Laboratory services were provided by EMC Labs, Inc., a National Voluntary Laboratory Accreditation Program (NVLAP) certified laboratory (NVLAP code #101424-0) located in Phoenix, Arizona.

FINDINGS

Asbestos Containing Materials

The following table presents the location and quantities of each suspect building material identified and sampled or assumed to contain asbestos during this survey:

BSD-West Tualatin View Elementary School			
Sample No.	**Materials / Areas**	**Material Location**	**Estimated Quantity**
WTVES-01A WTVES-01B WTVES-01C	Pipe Run Insulation, Black	A118 & A122	20 LF

BSD-West Tualatin View Elementary School			
Sample No.	**Materials / Areas**	**Material Location**	**Estimated Quantity**
WTVES-05A WTVES-05B WTVES-05C	4" Pipe Run Insulation, White	Crawl Space	1,500 LF
Assumed	Transite Pipe	Beneath Ground	600 LF

Negative Materials (No Asbestos Detected)

Results of the bulk sampling indicated three (3) of the six (6) following sampled materials contained no detectable levels of asbestos, based on the PLM method:

BSD-West Tualatin View Elementary School			
Sample No.	**Materials / Areas**	**Material Location**	**Estimated Quantity**
WTVES-02A WTVES-02B WTVES-02C	Pipe Run Covering, Beige	Crawl Space	1,500 LF
WTVES-03A WTVES-03B WTVES-03C	Hard Fittings, White	Crawl Space	500 SF
WTVES-04A WTVES-04B WTVES-04C	Ceramic Tile Grout/Glue	Kitchen	500 SF

RECOMMENDATIONS

Asbestos Containing Materials

All identified asbestos containing materials from this investigation and previous investigations must be removed by a licensed asbestos abatement contractor prior to them being impacted by any renovation or demolition activities. Additionally, any materials uncovered during renovation or demolition activities that are not addressed in this inspection report or prior reports for the building are considered presumed asbestos containing materials and must be sampled by an accredited asbestos inspector prior to disturbance, or they must be treated as asbestos containing.

DISCLAIMER

The content presented in this report is based on data collected during the site inspection and survey, review of pertinent regulations, requirements, guidelines and commonly followed industry standards, and information provided by Client, their clients, agents, and representatives.

The work has been conducted in an objective and unbiased manner and in accordance with generally accepted professional practice for this type of work. TRC believes the data and analysis to be accurate and relevant but cannot accept responsibility for the accuracy or completeness of available documentation or possible withholding of information of other parties.

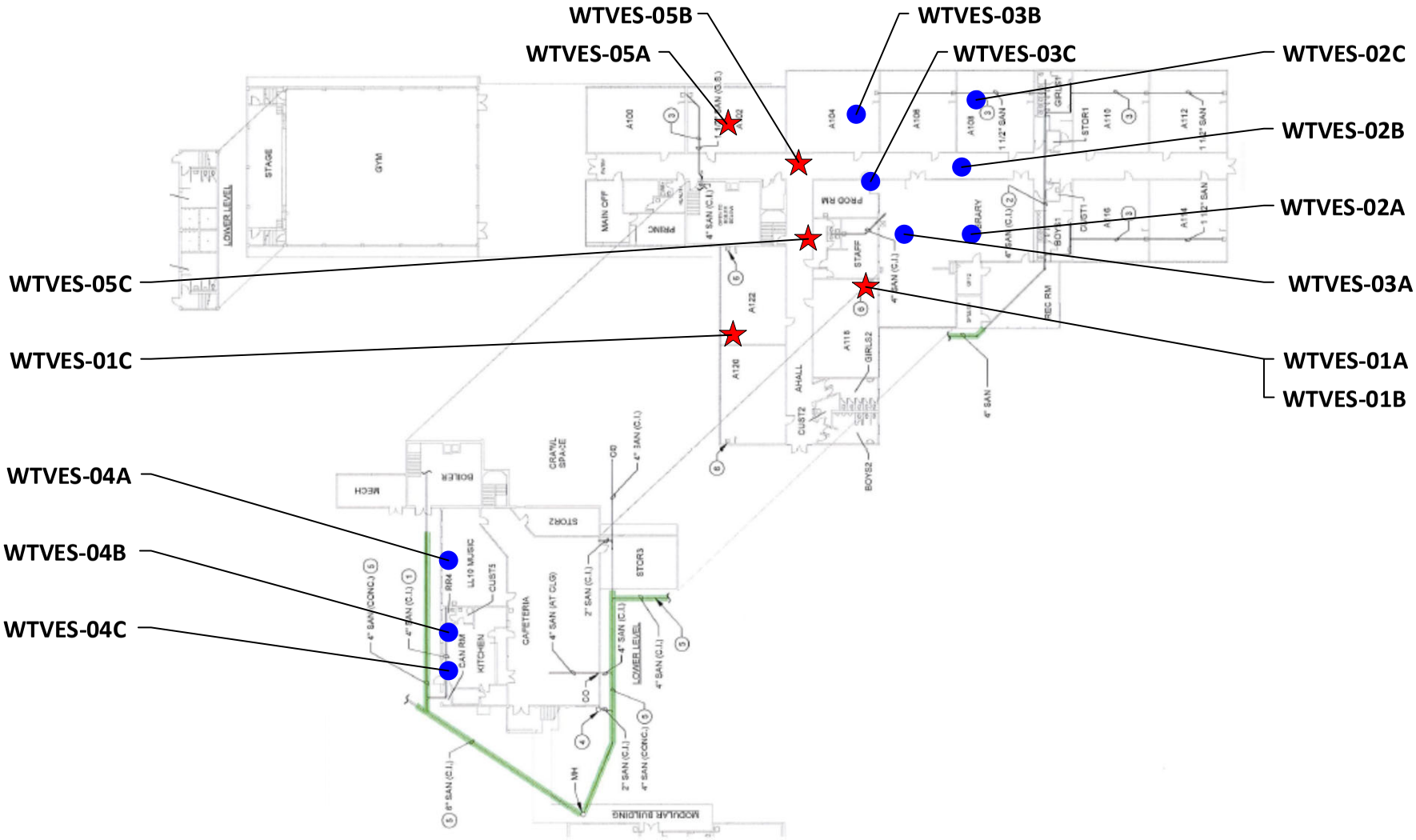
This limited asbestos survey report is designed to aid the property owner, architect, construction manager, general contractor, remediation contractor and/or asbestos abatement contractor in locating asbestos containing materials, and is not to be used as a bidding document.

Sincerely,
TRC Environmental Corporation

Jason Stone
Project Manager

Ron Landolt, CAC
NW Region BSI Practice Manager

APPENDIX A – SAMPLE LOCATION DIAGRAMS



LEGEND

- Non-Asbestos Sample Location
- Asbestos-Containing Sample Location

LIMITED ASBESTOS SURVEY REPORT
SAMPLE LOCATION DIAGRAM
WEST TUALATIN VIEW ELEMENTARY SCHOOL
SEWER REPLACEMENT
8800 SW LEAHY ROAD
BEAVERTON, OREGON 97225

TRC Project No.: 430813		Figure: 1
Drawn by: JS	Reviewed by: RAL	Date: February 2021

TRC
4105 SE International Way, Suite 505
Milwaukie, Oregon 97222
Phone: (503) 387-3251 Fax: (503) 908-1318

APPENDIX B – REPRESENTATIVE PHOTOGRAPHS

TRC | mobile data solutions

February 26, 2021

WEST TUALATIN VIEW ELEMENTARY SCHOOL – OVERVIEW PHOTOGRAPHIC LOG

TRC | mobile data solutions

February 26, 2021

WEST TUALATIN VIEW ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: WTVES-01A, WTVES-01B, & WTVES-01C
Material Description: Pipe Run Insulation
Material Color: Gray
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Positive
Asbestos Type: Pipe Run Insulation - 3% Chrysotile
Pipe Run Insulation Covering - ND
Homogeneous Area: A118 & A122
Total Approximate Quantity: 20 LF
Condition: Good
Material Type: TSI
NESHAP Category: N/A
Notes: Not Applicable

Sample Numbers: WTVES-02A, WTVES-02B, & WTVES-02C
Material Description: Pipe Run Covering
Material Color: Beige
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Negative
Asbestos Type: No Asbestos Detected
Homogeneous Area: Crawl Space
Total Approximate Quantity: 1,500 LF
Condition: Damaged
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable

TRC | mobile data solutions

February 26, 2021

WEST TUALATIN VIEW ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: WTVES-03A, WTVES-03B, & WTVES-03C **Material Description:** Hard Fittings **Material Color:** White **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Crawl Space **Total Approximate Quantity:** 500 SF **Condition:** Damaged **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	
Sample Numbers: WTVES-04A, WTVES-04B, & WTVES-04C **Material Description:** Ceramic Tile Grout/Glue **Material Color:** Gray **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Kitchen **Total Approximate Quantity:** 1,000 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	

TRC | mobile data solutions

February 26, 2021

WEST TUALATIN VIEW ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: WTVES-05A, WTVES-05B, WTVES-05C
Material Description: 4" Pipe Run Insulation
Material Color: White
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Positive
Asbestos Type: Pipe Run Insulation - 10% Chrysotile & 3% Amosite
Pipe Run Insulation Covering - ND
Homogeneous Area: Crawl Space
Total Approximate Quantity: 1,500 LF
Condition: Good
Material Type: TSI
NESHAP Category: N/A
Notes: Not Applicable

Sample Numbers: N/A
Material Description: Transite Pipe
Material Color: Gray
Accessible Material: Inaccessible
Reason Inaccessible: No Access
Asbestos Detected: N/A
Asbestos Type: N/A
Homogeneous Area: Beneath Ground
Total Approximate Quantity: 600 LF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable

APPENDIX C – LABORATORY RESULTS AND CHAIN OF CUSTODY

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0249691

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	TRC SOLUTIONS	Job# / P.O. #:	430813
Address:	4105 SE INTERNATIONAL WAY, STE 505	Date Received:	02/19/2021
	MILWAUKIE OR 97222	Date Analyzed:	02/24/2021
Collected:	02/18/2021	Date Reported:	02/24/2021
Project Name:	WEST TUALATIN VIEW ELEM. SCHOOL	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0249691-001 WTVES-01A	A118 & A122-SEE DIAGRAM	LAYER 1 Pipe Run Insulation, Gray	Yes	Chrysotile	3%	Cellulose Fiber	95%
						Gypsum Binder/Filler	2%
		LAYER 2 Pipe Run Insulation Covering, Black	No	None Detected		Cellulose Fiber	30%
						Gypsum Quartz Binder/Filler	70%
0249691-002 WTVES-01B	A118 & A122-SEE DIAGRAM	LAYER 1 Pipe Run Insulation, Gray	Yes	Chrysotile	3%	Cellulose Fiber	95%
						Gypsum Binder/Filler	2%
		LAYER 2 Pipe Run Insulation Covering, Black	No	None Detected		Cellulose Fiber	30%
						Gypsum Quartz Binder/Filler	70%
0249691-003 WTVES-01C	A118 & A122-SEE DIAGRAM	LAYER 1 Pipe Run Insulation, Gray	Yes	Chrysotile	3%	Cellulose Fiber	95%
						Gypsum Binder/Filler	2%
		LAYER 2 Pipe Run Insulation Covering, Black	No	None Detected		Cellulose Fiber	30%
						Gypsum Quartz Binder/Filler	70%
0249691-004 WTVES-02A	CRAWLSPACE-SEE DIAGRAM	Pipe Run Covering, Beige	No	None Detected		Cellulose Fiber	95%
						Gypsum Binder/Filler	5%
0249691-005 WTVES-02B	CRAWLSPACE-SEE DIAGRAM	Pipe Run Covering, Beige	No	None Detected		Cellulose Fiber	95%
						Gypsum Binder/Filler	5%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0249691

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	TRC SOLUTIONS	Job# / P.O. #:	430813
Address:	4105 SE INTERNATIONAL WAY, STE 505	Date Received:	02/19/2021
	MILWAUKIE OR 97222	Date Analyzed:	02/24/2021
Collected:	02/18/2021	Date Reported:	02/24/2021
Project Name:	WEST TUALATIN VIEW ELEM. SCHOOL	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0249691-006 WTVES-02C	CRAWLSPACE-SEE DIAGRAM	Pipe Run Covering, Beige	No	None Detected	Cellulose Fiber	95%
					Gypsum	
					Binder/Filler	5%
0249691-007 WTVES-03A	CRAWLSPACE-SEE DIAGRAM	LAYER 1 Hard Fitting, White	No	None Detected	Mineral Wool	30%
					Gypsum	
					Carbonates	
					Quartz	
					Perlite	
					Binder/Filler	70%
		LAYER 2 Hard Fitting, Yellow	No	None Detected	Fibrous Glass	95%
					Cellulose Fiber	1%
					Carbonates	
					Gypsum	
					Binder/Filler	4%
		LAYER 3 Hard Fitting Covring, Beige	No	None Detected	Cellulose Fiber	95%
					Fibrous Glass	2%
					Gypsum	
					Binder/Filler	3%
0249691-008 WTVES-03B	CRAWLSPACE-SEE DIAGRAM	Hard Fitting, White	No	None Detected	Mineral Wool	30%
					Gypsum	
					Carbonates	
					Quartz	
					Perlite	
					Binder/Filler	70%
0249691-009 WTVES-03C	CRAWLSPACE-SEE DIAGRAM	Hard Fitting, White	No	None Detected	Mineral Wool	30%
					Gypsum	
					Carbonates	
					Quartz	
					Perlite	
					Binder/Filler	70%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0249691

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	TRC SOLUTIONS	Job# / P.O. #:	430813
Address:	4105 SE INTERNATIONAL WAY, STE 505	Date Received:	02/19/2021
	MILWAUKIE OR 97222	Date Analyzed:	02/24/2021
Collected:	02/18/2021	Date Reported:	02/24/2021
Project Name:	WEST TUALATIN VIEW ELEM. SCHOOL	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0249691-010 WTVES-04A	KITCHEN-SEE DIAGRAM	LAYER 1 Ceramic Tile, Lt. Green	No	None Detected			
						Gypsum	
						Quartz	
						Binder/Filler	100%
		LAYER 2 Ceramic Tile Grout, White	No	None Detected			
						Carbonates	
						Gypsum	
						Quartz	
						Binder/Filler	100%
		LAYER 3 Ceramic Tile Grout, Gray	No	None Detected		Cellulose Fiber	<1%
						Quartz	
						Gypsum	
						Carbonates	
						Mica	
						Binder/Filler	99%
0249691-011 WTVES-04B	KITCHEN-SEE DIAGRAM	LAYER 1 Ceramic Tile, Lt. Green	No	None Detected			
						Gypsum	
						Quartz	
						Binder/Filler	100%
		LAYER 2 Ceramic Tile Grout, Gray	No	None Detected			
						Quartz	
						Gypsum	
						Carbonates	
						Mica	
						Binder/Filler	100%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0249691

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	TRC SOLUTIONS	Job# / P.O. #:	430813
Address:	4105 SE INTERNATIONAL WAY, STE 505	Date Received:	02/19/2021
	MILWAUKIE OR 97222	Date Analyzed:	02/24/2021
Collected:	02/18/2021	Date Reported:	02/24/2021
Project Name:	WEST TUALATIN VIEW ELEM. SCHOOL	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0249691-012 WTVES-04C	KITCHEN-SEE DIAGRAM	LAYER 1 Ceramic Tile, Lt. Green	No	None Detected			
						Gypsum	
						Quartz	
						Binder/Filler	100%
		LAYER 2 Ceramic Tile Grout, Gray	No	None Detected			
						Quartz	
						Gypsum	
						Carbonates	
						Mica	
						Binder/Filler	100%
0249691-013 WTVES-05A	CRAWLSPACE-SEE DIAGRAM	LAYER 1 4" Pipe Run Insulation, White	Yes	Chrysotile	10%		
				Amosite	3%		
						Gypsum	
						Quartz	
						Binder/Filler	87%
		LAYER 2 4" Pipe Run Insulation Covering, Black	No	None Detected		Cellulose Fiber	20%
						Gypsum	
						Quartz	
						Binder/Filler	80%
0249691-014 WTVES-05B	CRAWLSPACE-SEE DIAGRAM	LAYER 1 4" Pipe Run Insulation, White	Yes	Chrysotile	10%		
				Amosite	3%		
						Gypsum	
						Quartz	
						Binder/Filler	87%
		LAYER 2 4" Pipe Run Insulation Covering, Black	No	None Detected		Cellulose Fiber	20%
						Gypsum	
						Quartz	
						Binder/Filler	80%

EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report
0249691

Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	TRC SOLUTIONS	Job# / P.O. #:	430813
Address:	4105 SE INTERNATIONAL WAY, STE 505	Date Received:	02/19/2021
	MILWAUKIE OR 97222	Date Analyzed:	02/24/2021
Collected:	02/18/2021	Date Reported:	02/24/2021
Project Name:	WEST TUALATIN VIEW ELEM. SCHOOL	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID / Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type	(%)	Non-Asbestos Constituents	
0249691-015 WTVES-05C	CRAWLSPACE-SEE DIAGRAM	LAYER 1 4" Pipe Run Insulation, White	Yes	Chrysotile Amosite	10% 3%		
						Gypsum Quartz Binder/Filler	87%
		LAYER 2 4" Pipe Run Insulation Covering, Black	No	None Detected		Cellulose Fiber	20%
						Gypsum Quartz Binder/Filler	80%

Analyst - Matt Kettler

Signatory - Lab Director - Kurt Kettler

Page ___ of ___

CHAIN OF CUSTODY

EMC Labs, Inc.
9830 S. 51st St., Ste B-109
Phoenix, AZ 85044
(800) 362-3373 Fax (480) 893-1726

LAB#: 249691
TAT: 3 day
Rec'd: FEB 19 PM

COMPANY NAME: TRC SOLUTIONS
4105 SE International Way, Ste 505
Milwaukie, OR 97222
CONTACT: Matthew Cuda
Phone/Fax: (503) 860-8173 / (503) 282-0102
Email: mcuda@trcsolutions.com

BILL TO: (If Different Location)

Now Accepting: VISA – MASTERCARD

Price Quoted: $_____ / Sample $_____ / Layers

COMPLETE ITEMS 1-4: (Failure to complete any items may cause a delay in processing or analyzing your samples)

1. TURNAROUND TIME: [Same Day RUSH] [1-Day] [2-Day] [3-Day] [5-Day] [6-10 Day]

****Prior confirmation of turnaround time is required**
****Additional charges for rush analysis (please call marketing department for pricing details)**
****Laboratory analysis may be subject to delay if credit terms are not met**

2. TYPE OF ANALYSIS: [Bulk-PLM] [Air-PCM] [Lead] [Point Count] [Fungi: AOC, W-C, Bulk, Swab, Tape]

3. DISPOSAL INSTRUCTIONS: [Dispose of samples at EMC] / [Return samples to me at my expense]
(If you do not indicate preference, EMC will dispose of samples 30 days from analysis.)

4. Project Name: West Tualatin View Elementary School
P.O. Number: _____ **Project Number:** 430813

EMC SAMPLE #	CLIENT SAMPLE #	DATE & TIME SAMPLED	LOCATION/MATERIAL TYPE	Samples Accepted Yes / No	AIR SAMPLE INFO / COMMENTS ON	OFF	FLOW RATE
01	WTVES-01A	2-18-21		N			
				Y N			
				Y N			
				Y N			
				Y N			
				Y N			
15	WTVES-05C	2/18/21		N			
				Y N			
				Y N			
				Y N			
				Y N			
				Y N			
				Y N			
				Y N			
				Y N			

SPECIAL INSTRUCTIONS: _____

Sample Collector: (Print) _____ (Signature) _____

Relinquished by: _____ Date/Time: _____ Received by: Diana Federico Date/Time: 2/19/21 115 pm

Relinquished by: Diana Federico Date/Time: 2/19/21 315 pm Received by: [signature] Date/Time: 2/19/21 315 PM

Relinquished by: _____ Date/Time _____ Received by: _____ Date/Time: _____

** In the event of any dispute between the above parties for these services or otherwise, parties agree that jurisdiction and venue will be in Phoenix, Arizona and prevailing party will be entitled to attorney's fees and court costs.

Rev. 09/01/08

249691

Relinquished By:	Date and Time	Received By:	Date and Time
1. (Print): Jason Stone	02/18/2021 1:44 pm America/Los_Angeles	Diana Federico	2/19/21 1:15 ~~3:15~~
. (Sign):		Diana Federico	
II. (Print): Diana Federico	2/19/21 3:15	Matt Kettler	2/19/21 3:15 PM
(Sign): Diana Federico			
Email Results To: mcuda@trccompanies.com,rlandolt@trccompanies.com	**Analytical Method:** PLM EPA 600/R-93/116	**Lab Comments:**	

APPENDIX D – CERTIFICATIONS

Certificate of Completion

This is to certify that

Jason Stone

has satisfactorily completed
4 hours of refresher training as an

AHERA Building Inspector

to comply with the training requirements of
TSCA Title II, 40 CFR 763 (AHERA)

EPA Provider # 1085

179818
Certificate Number

ARGUS PACIFIC
TRAINING • CONSULTING
A Terracon COMPANY

Dec 16, 2020 — Expires in 1 year.
Date(s) of Training

Exam Score: N/A
(if applicable)

Instructor: Ed Edinger

ARGUS PACIFIC, INC / 21905 64th AVE W, SUITE 100 / MOUNTLAKE TERRACE, WASHINGTON 98043 / 206.285.3373 / ARGUSPACIFIC.COM