BSD Security Upgrades Classroom Walls

Bid and Permit Set Specifications

December 10th, 2021

Bid Package:
Elmonica, Errol Hassell, and Greenway Elementary Schools

Prepared For:

Beaverton School District

Prepared by:

Convergence Architecture

Convergence Architecture Project #4008

TABLE OF CONTENTS

- 099100 PAINTING

DIVISION 10 – SPECIALTIES

- 102613 CORNER GUARDS

DIVISION 21 – FIRE SUPPRESSION

- Not included.

DIVISION 22 – PLUMBING

- 220000 BASIC PLUMBING REQUIREMENTS
- 220523 GENERAL DUTY VALVES FOR PLUMBING PIPING
- 220529 HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
- 220553 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
- 220719 PLUMBING INSULATION
- 221100 FACILITY WATER DISTRIBUTION
- 224200 COMMERCIAL PLUMBING FIXTURES

DIVISION 23 – MECHANICAL

- 230000 GENERAL MECHANICAL REQUIREMENTS

DIVISION 26 – ELECTRICAL

- 260000 GENERAL ELECTRICAL REQUIREMENTS
- 260108 ELECTRICAL TESTING
- 260519 LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
- 260533 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
- 260553 ELECTRICAL AND CONTROL IDENTIFICATION
- 260583 WIRING CONNECTIONS
- 262726 WIRING DEVICES
- 265100 INTERIOR LIGHTING
- 265600 EXTERIOR LIGHTING

DIVISION 27 – COMMUNICATION SYSTEMS

- 270000 GENERAL COMMUNICATIONS SYSTEM REQUIREMENTS
- 270000 COMMUNICATIONS HORIZONTAL CABLING
- 275113 PAGING AND CLOCK SYSTEMS

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

- 283000 FIRE DETECTION AND ALARM
- 283100 INSTRUSION DETECTION

DIVISION 32 – EXTERIOR IMPROVEMENTS

- 321123 AGGREGATE BASE COURSE
- 321216 ASPHALT PAVING

TESTING REPORTS

- BSD_ELMONICA ELEMENTARY_ASBESTOS SURVEY REPORT_03-25-2021
- BSD_ERROL HASSELL ELEMENTARY_ASBESTOS SURVEY REPORT_03-25-2021
- BSD_GREENWAY ELEMENTARY_ASBESTOS SURVEY REPORT_03-25-2021

END OF SECTION

SECTION 00 01 07

SEALS PAGE

DESIGN PROFESSIONALS OF RECORD

Architect: Convergence Architecture

Electrical Engineer: Landis Consulting

SECTION 00 01 15

LIST OF DRAWINGS

NOTE: Users of this Project Manual shall check the Construction Documents with the List of Drawings to be sure each sheet is included.

LIST OF DRAWINGS (100% PACKAGE - DATED 12/10/2021)

ARCHITECTURAL

ELMONICA ELEMENTARY SCHOOL:

E.A0	COVER SHEET
E.A0.1	CODE REVIEW
E.A1	ACCESSIBILITY IMPROVEMENTS
E.A2a	FLOOR PLAN A
E.A2b	FLOOR PLAN B
E.A3	SECTIONS, INTERIOR ELEVATIONS, SCHEDULES
E.A4a	REFLECTED CEILING PLAN A
E.A4b	REFLECTED CEILING PLAN B
A.8	GENERAL DETAILS
A.9	DOOR AND WINDOW DETAILS
E.1	ELECTRICAL LEGEND
E.ED2	ELECTRICAL DEMOLITION FLOOR PLAN - A
E.ED3	ELECTRICAL CEILING DEMOLITION PLAN - A
E.ED4	ELECTRICAL DEMOLITION FLOOR PLAN – B
E.E2	ELECTRICAL FLOOR PLAN - A
E.E3	ELECTRICAL CEILING PLAN - A
E.E4	ELECTRICAL FLOOR PLAN - B

ERROL HASSELL ELEMENTARY SCHOOL:

EH.A0	COVER SHEET
EH.A0.1	CODE REVIEW
EH.A1	ACCESSIBILITY IMPROVEMENTS
EH.A2a	FLOOR PLAN A
EH.A2b	FLOOR PLAN B
EH.A3	INTERIOR ELEVATIONS, SCHEDULES
EH.A4	REFLECTED CEILING PLANS
A.8	GENERAL DETAILS
A.9	DOOR AND WINDOW DETAILS
E.1	ELECTRICAL LEGEND
EH.ED2	ELECTRICAL DEMOLITION FLOOR PLAN - A
EH.ED3	ELECTRICAL CEILING DEMOLITION PLAN - A
EH.ED4	ELECTRICAL DEMOLITION FLOOR PLAN - B
EH.ED5	ELECTRICAL CEILING DEMOLITION PLAN - B
EH.E2	ELECTRICAL FLOOR PLAN - A
EH.E3	ELECTRICAL CEILING PLAN - A
EH.E4	ELECTRICAL FLOOR PLAN - B

EH.E5 ELECTRICAL CEILING PLAN – B

GREENWAY ELEMENTARY SCHOOL:

G.A0 COVER SHEET
G.A0.1 CODE REVIEW
G.A1 ACCESSIBILITY IMPROVEMENTS
G.A2 FLOOR PLAN AND SECTION
G.A3 SECTIONS, INTERIOR ELEVATIONS, SCHEDULES
G.A4 REFLECTED CEILING PLAN
A.8 GENERAL DETAILS
A.9 DOOR AND WINDOW DETAILS
E.1 ELECTRICAL LEGEND
G.ED2 ELECTRICAL DEMOLITION FLOOR PLAN
G.ED3 ELECTRICAL CEILING DEMOLITION PLAN
G.E2 ELECTRICAL FLOOR PLAN
G.E3 ELECTRICAL CEILING PLAN

END OF SECTION

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 CONDITIONS AND REQUIREMENTS

A. The Bidding Requirements, provided under Division 0, and the Sections contained in Division 1 – GENERAL REQUIREMENTS of these Specifications apply to the Work specified in this Section.

1.2 SECTION INCLUDES

A. Sections contained in Division 0 and Division 1 of the Specifications apply to the Work specified in this Section and in each Section of the Specifications. The Contractor shall instruct each of his Subcontractors to become fully familiar and comply with all requirements of these documents.

B. The project and the Work of the Contract can be described in summary as follows:
1. Interior selective demolition as indicated on Drawings.
2. Interior construction of new walls and doors as indicated on Drawings and as specified herein.

C. General:
1. Do not interrupt electric, gas, water or other services to existing Owner occupied structures without at least 72 hours prior notice to the District and then only at a definite time and for a definite duration approved by the District.
2. Contractor shall schedule demolition and remodel to accommodate Owner's continued use of existing mechanical, plumbing and electrical services as required for Owner's continued occupancy and beneficial use of designated areas.
3. Provide all services required. Protect and maintain existing utilities, active electrical conductors, sewers, pipes, and other active lines on school property.
4. Utilities, pipes, sewers, electrical conductors and the like to be abandoned shall be capped in accordance with instruction of governing authority or as directed.

D. Protections:
1. Protect sidewalks, asphalt paving, concrete, shrubs and lawn areas at all times from spillage of materials used in carrying out the Work. Exercise care to preclude materials from clogging catch basins and yard drains. Leave all drainage items clean and in proper working condition.
2. Clean, repair, resurface or restore existing surfaces to their original condition, or completely replace such surface to match existing, where damaged by construction operations.

1.3 ASBESTOS FREE CERTIFICATION

A. Absolutely no materials containing asbestos are to be provided or installed as part of this Project. The Contractor shall ensure that no subcontractor or any of Contractor's own forces installs any materials containing asbestos. At final closeout of the Project, the Contractor shall provide to the School District certification that no materials containing asbestos have been installed in the Project and that the Project is asbestos free as required by the State of Oregon.
1. Upload letter of certification to E-Builder to verify it meets the needs of the District.

1.4 COORDINATION

A. The Contractor is responsible for overall coordination of the Project.

B. The Drawings and Specifications are arranged for convenience only and do not necessarily determine which trades perform the various portions of the Work.

C. Coordinate sequence of the Work to accommodate Owner occupancy. If mechanical, electrical, or plumbing work is to interrupt power or water usage, the District must be notified 72 hours in advance.

D. Do all necessary Work to receive or join the Work of all trades.

E. Verify location of existing utilities and protect from damage.

F. Mechanical and Electrical Drawings: The mechanical and electrical drawings are diagrammatic. Additional offsets and bends may be required and are to be installed as may be required. The Architect may make minor adjustments in fixture, outlets, grille, louver, or ventilator locations prior to rough-in work with no additional cost to the project.

G. Calculate dimensions and measures for layout of work; do not scale the Drawings. Record deviations from Drawing information on existing conditions, and review with the Architect at time of discovery. Record actual conditions on project record drawings.

H. Installer Inspection:
   1. Require installer of each major unit of work to inspect substrate and conditions for installation, and to report unsatisfactory conditions in writing. Correct unsatisfactory conditions before proceeding with installation.
   2. Inspect each product immediately before installation. Do not install damaged or defective products, materials, or equipment.
   3. Start of installation shall be understood as acceptance of substrate conditions by the installer.

I. Clearances: Review the Design Drawings for possible conflicts prior to rough-in. Contractor is responsible for verification that equipment will fit in the space provided. Resolve conflicts with the Architect prior to rough-in work.

1.5 CUTTING AND PATCHING

A. Provide cutting, fitting, and patching of the Work as required.

B. Make its several parts fit properly together.

C. Uncover Work to provide for installation of ill-timed Work.

D. Remove and replace defective Work.

E. Remove and replace Work not conforming to requirements of Contract Documents.

F. Remove samples of installed Work as specified or where directed for testing.

G. Install specified Work in existing construction.

H. Uncover Work to provide for Architect's observation of Work covered prior to inspection or approval.

I. Provide routine penetrations of non-structural surfaces for installation of piping, ducts, electrical conduit, and other mechanical and electrical items.

1.6 SUBMITTALS-All BSD contracts require use of E-Builder Process module.

A. Submit schedule of all shop drawings, product data and samples specified in each individual section of the project manual. Coordinate construction schedule and installation dates of each product and assembly and allow ample time for Architect's review. Allow time for possible disapproval and resubmission.

B. Deliver submittals (that need to be reviewed in person) to Convergence Architecture, 7302 N. Richmond Avenue, Portland, OR 97203.

C. Transmit each item under Architect-accepted form. Identify Project, Contractor, Subcontractor, and major supplier; identify pertinent Drawing sheet and detail number, and Specification Section number, as appropriate. Identify deviations from Contract Documents. Provide space for Contractor and Architect review stamps.

D. Apply Contractor's stamp, signed or initialed certifying that review, 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.

E. Coordinate submittal of related items with construction schedule for timely submittal to the Architect.

F. After Architect's review of submittal, revise and resubmit as required, identifying changes made since previous submittal.

G. Do not fabricate products or begin work that requires submittals until return of submittal with Architect acceptance.

H. Timing of Submittals:
1. Submittals – Within 10 days of Notice of Award of Contract:
    a. A designation of the Work to be performed by the Contractor by his own forces.
    b. List of Subcontractors and major materials suppliers for principal portions of the Work.
2. Submittals – Prior to Notice to Proceed:
    a. Executed Agreement.
    b. Performance and Labor & Material Payment bonds per Oregon Law (ORS 279.029, 279.542, 701.430) with certified copy of Power of Attorney from Attorney-in-Fact executing bonds.
    c. Certified copies of Contractor's Liability Insurance Policies (AIA Doc.G705)
3. Submittals – Within 15 days After Notice to Proceed and Prior to first Payment Application, upload the following to the Submittal Module on E-Builder:
    a. Schedule of values.
    b. Schedule of submittals. Upload to Submittal Register on E-Builder.
    c. Copies of acquired building permit licenses etc. to complete the work of this contract.

d. Construction schedule.

4. Submittals – Prior to each Month's Payment:
   a. Application and Certificate for Payment (AIA Document G702 and G703).
      1 Submit with back-up using Invoice Approval Process in E-Builder.
   b. Notarized affidavit of payments to all subcontractors and major material suppliers.
   c. Updated construction schedule.
   d. Public Works Contractor Wage Certification per Oregon Law. Upload BOLI Payroll submittals to E-Builder.
5. Submittals – Prior to Substantial Completion: Notification to Architect that work of the Project is substantially complete, including a listing of items of work to be completed or corrected, together with certificate of occupancy or occupancy permit issued by the Local Building Department for the entire Project.
   a. Attach Commissioning Reports for critical life safety systems to Substantial Completion notification on E-Builder I. Schedule of Values:
      1 Submit typed schedule on AIA Form G703. Contractor's standard form or media-driven printout will be considered on request.
      2 Provide breakdown per each specification section listed in the project manual.
      3 Upload draft of Schedule of Values to the Submittal Module on E-Builder.

J. See Section 01 33 00 SUBMITTAL PROCEDURES.

PART 2 PRODUCTS

2.1 MATERIAL

A. The Contractor warrants to the Owner that the materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

PART 3 EXECUTION (Not Used)

END OF SECTION

01 14 00

WORK RESTRICTIONS

PART 1 GENERAL

1.1 WORK RESTRICTIONS

A. Work Sequence:
1. Complex schedules, phased construction and/or compressed schedules are common.
2. Coordinate work sequence and phased construction requirements with BSD Representative.

1.2 CONTRACTOR USE OF PREMISES – GENERAL

A. General: Owner will occupy portions of the building during the construction period. Do not interfere with the Owner's operations. Coordinate use of premises under the direction of the Owner.

B. Use of Site:
1. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored on the Site.
2. Confine operations at the site to the areas permitted. Portions of the site beyond areas on which work is indicated are not to be disturbed.
3. Move any stored Products, under Contractor's control, which interfere with operations of Owner or separate contractors.
4. Keep existing driveways and entrances serving the premises clear and available at all times.
5. Maintain continuity of utility services to existing building.
6. Lock automotive type vehicles and other mechanized or motorized construction equipment, when parked and unattended. Do not leave vehicles or equipment unattended with the motor running. Keys are not to be left in the vehicle.
7. Do not encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated.
8. Limit access to prohibited locations and arrange schedules with BSD personnel.
9. Define contractor areas for work, access, staging, storage, etc.
10. Provide staging & logistics plan. Delineate on site plan. Submit Staging & Logistics Plan with submission of Construction Schedule.

1.3 CONTRACTOR USE OF PREMISE – EXISTING BUILDINGS

A. Use of Site:
1. Maintain the existing building in a safe and weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.
2. Keep public areas such as hallways, stairs, and toilet rooms free from accumulation of waste material, rubbish, or construction debris.
3. Smoking/ vaping of tobacco or marijuana products, or open fires, will not be permitted within the building enclosure or on the work site premises at all.
4. Contractor personnel prohibited from undesignated areas.
5. Toilet facilities are the Contractor's responsibility to provide.
6. Limit/contain smoke, dust, dirt, noise – including radios to immediate work area.

7. Broom-clean work area daily.
8. Restore existing surfaces where damaged or modified by construction operations to their original condition.
9. Room may be designated for use as a field office if coordinated through the BSD representative. Room must be vacated by stipulated completion date, regardless of authorized adjustments to construction schedule.

1.4 OCCUPANCY REQUIREMENTS – EXISTING BUILDINGS

A. Scheduling Requirements:
1. Contractor shall organize and coordinate work in a manner that does not interfere with the normal operations of areas of the facility being occupied and used by the Owner.
2. Contractor shall maintain safe and convenient public access to the toilet rooms at all times that the facility is normally open to the public.
3. Contractor shall continuously maintain public entry to the portions of the building being used by the Owner. The Contractor shall also continuously maintain safe, direct and legal exiting routes from all areas of the building to the outside.
5. Communications shall include:
a. Megan Finch, construction Project Manager:
1) Cell Phone: 971-276-0097
2) Office Phone: 503-356-4318
3) Email: Megan_Finch@beaverton.k12.or.us

B. Provide for continued occupancy, access, and egress. Existing utilities shall be maintained to the building. Provide minimum 24 hour notice for any disruption.

C. Provide safety protection for occupants.

1.5 WORK SEQUENCE

A. Coordinate the construction schedule and operations with the Owner's Designated Representative.

B. The Contractor is responsible for employing an approved abatement contractor for the removal of hazardous materials at the school as necessary.

C. It is anticipated that Contractor may begin work in June, 2021.

D. All work shall be substantially complete on or before August, 2021.

E. Final Completion shall occur no later than September, 2021.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Description: Alternates indicated Bid Proposal, include changes in Work as described by the Alternates listed in this Section. Alternates may be either additive or deductive to the Base Bid. The alternate amount will either be added to or deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either scope of work or in products, materials, equipment, systems, or installation methods described in the Contract Documents.

B. Coordination: Coordinate related Work and modify or adjust surrounding Work that is affected by each accepted alternate and ensure that work is complete and fully integrated as required to complete the Project under each alternate.

C. Note that the Information for Bidders requires that bidders bid upon all Alternates that may be indicated on the Bid Proposal. Bid the Alternate as Lump Sums which will be considered independently of each other.

D. The Owner's electing to exercise any Alternate does not relieve the Contractor of timely completion of the project, within the periods indicated.

E. Notification: Immediately following award of Contract, prepare and distribute to each party involved, notification of the status of each alternate. Indicate whether alternates have been accepted, rejected, or deferred for consideration at a later date.

F. Schedule:
1. A "Schedule of Alternates" is included at the end of this section.
2. Specification Sections that may be referenced in each Alternate contain pertinent requirements for materials and installation to achieve the Work described by each Alternate.
3. Include as part of each Alternate, miscellaneous devices, appurtenances, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

PART 2 PRODUCTS

Not Included.

PART 3 EXECUTION

Not Included.

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SUBSTITUTIONS

A. Submit two copies of CSI substitution form attached at the end of this document to the Architect via E-Builder. Architect to forward any substitution to BSD representative for approval via E-Builder prior to acceptance by the Architect.

B. Include in Request:
1. Complete data substantiating compliance of proposed substitution with Contract Documents.
2. For Products:
   a. Product identification, including manufacturer's name and address.
   b. Manufacturers literature.
   c. Product description.
   d. Performance and test data
   e. Reference standards.
   f. Samples, where appropriate.
   g. Name and address of similar projects on which product was used and date of installation.
   h. If item deviates from District standards.
      1) District Standards can be viewed at the District's website at www.beaverton.k12.or.us/depts/facilities. at Home Page, click on Facilities Development" for list of documents.
   i. Maintenance requirements
   j. Unit Cost
3. For Construction Methods:
   a. Detailed description of proposed method and Drawings illustrating methods.
   b. Itemized comparison of proposed substitutions with product or method specified.
   c. Data relating to changes in construction schedule.
   d. Accurate cost data on proposed substitution in comparison with product or method specified.
   e. If method deviates from District standards.
      1) District Standards can be viewed at the District's website at www.beaverton.k12.or.us/depts/facilities. At Home Page, click on "Facilities Development" for list of documents.

C. Substitution after Award of Contract
1. Substitution of products will not normally be approved after Contract is executed. However, substitutions may be considered for one or more of the following conditions.
   a. Unavailability beyond control of Contractor, such as strikes, lockouts, discontinuance by the manufacturer or his authorized supplier.
   b. Requirements for compliance with final interpretation of code requirements or insurance regulations.
   c. BSD or Architect requested substitution.
   d. If it can be shown that specified product or system is not well suited for proposed application or that another is superior and/or less costly and has attached detailed documentation including cost savings/increase.

e. Subsequent information or data discloses inability of specified product to perform properly in the design for which it was intended.
f. Manufacturer or fabricator refusal to certify or guarantee performance of specified product as required.
g. Subsequent information that a long delivery rate will not be compatible with Contract construction period.
h. Proof for any of the above set forth conditions shall be submitted to the Consultant in writing with all pertinent data in the form of a Change Order Request for Consultant's and less costly substitution shall be credited to BSD's account.

END OF SECTION

Advancement of Construction Technology

SUBSTITUTION REQUEST
(During the Bidding Phase)

Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

A/E Project Number: _____

Re: _____

Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

A/E's REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: Date:

Supporting Data Attached: ☐ Drawings X☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐_____

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION

A. Forms and procedures for progress payments.

1.2 APPLICATION FORMS

A. For applications for payment, AIA Document G702, supported by AIA Document G703, Continuation Sheet.

B. Prepare the schedule of values in such a manner that each major item of Work and each subcontracted item of Work is shown as a line item broken down in terms of material and labor costs on AIA Document G703, Application and Certificate for Payment Continuation Sheet in similar format.

C. The schedule of values shall be submitted for review by the Owner and Architect prior to the first application for payment via E-Builder; and may be used when, and only when, accepted in writing by the Owner and Architect. Use E-Builder Submittal Module.

D. Payment request is to include the Contractor's Federal Tax Identification number and return address.

E. Each Application for Payment shall be based upon the Schedule of Values submitted by the Contractor to the BSD Representative and the Architect within 10 days of the award of Contract. The Schedule of Values shall allocate the entire Contract Sum among the various portions of the Work and be prepared in such form and supported by such data to substantiate its accuracy as the BSD Representative and the Consultant may require: Format AIA G702 with G703 Schedule of Values.

1.3 PAYMENTS

A. Owner will make progress payments on account of the Contract once monthly for the scheduled duration of the project based on the value of Work accomplished or materials in the job site, as stated in the schedule of values on the Application and Certificate for Payment. Complete and forward on or about the 1st day of the month.

B. Submit via E-Builder forms requesting payment for the Architect to review.

C. Payments will be made on protected materials on hand at the job site properly stored, protected, and insured. Materials held offsite in a bonded and insured warehouse will be considered for payment if the application for payment contains an insurance certificate and bill of sale for materials stored offsite. Estimated quantities shall be subject to Architect's review and judgment.

1.4 EARLY PURCHASE AND PAYMENT OF MATERIALS AND EQUIPMENT

A. Order materials and equipment requiring a long lead or waiting time early so as not to delay progress of the Work.

B. The Contractor will be reimbursed for early order materials or items upon receipt and verification of quality and quantity against submittals and shipping documents by Owner's Representative. Receipt shall be to the job site or stored at Owner's other premises in an orderly and safe manner, secured from normal weather damage. Security remains the responsibility of the Contractor.

C. When such items are procured by BSD, the items will be assigned to the General Contractor for receiving and installation.

D. As part of the procurement of the items, the specifications will require the start of the product warranty/guarantee extended to coincide with the Project Substantial Completion date and be fully assignable to the General Contractor or its designee.

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 COORDINATION

A. The contractor shall coordinate scheduling, submittals, sequencing of the installation of interdependent elements, utility coordination, and space requirements for installation and maintenance of finished work and storage or staging areas for all trades. The mechanical, electrical, and electrical drawings are diagrammatic and may require special coordination between trades. The Contractor shall provide multidisciplinary coordination of drawings as necessary to insure proper space and layout of various portions of the work.

B. Notes on various drawings are not meant to determine trade or work jurisdictions. As an example, there may be “architectural” items shown or indicated on mechanical, plumbing, and electrical drawings. Further, there may also be “mechanical”, “plumbing” or “electrical” items shown on architectural drawings. The Contractor is responsible to include all items in the bid cost regardless of which drawing they are indicated on.

C. The Contractor shall coordinate all work with the Owner’s representative to minimize conflict and insure the least inconvenience to the general public and adjoining properties. Claims for additional time or money resulting from a lack of coordination will not be considered.
   1. Directions shall originate only from the Owner’s designated representative and/or the Architect. Communications with other BSD stakeholders are to be considered supplementary and not binding. Instructions, information, and/or direction from other BSD stakeholders are <u>not</u> official direction, and must be confirmed with the Owner’s designated representative and/or the Architect.

1.2 SUPERVISION

A. The Contractor shall provide a competent superintendent who is present on-site during all phases of construction and while work is in progress.

1.3 PRE-CONSTRUCTION CONFERENCE

A. Purpose:
   1. To discuss items of interest in such detail that the Contractor shall have a clear understanding of the Owner's requirements, Contract Documents, and conditions affecting the Work. Items to be discussed include, but are not limited to:
      a. Roles of Architect, Owner, Contractor, and Inspectors.
      b. Procedures for handling change orders, requests for payment, and other administrative details.
      c. Procedures for handling shop drawing, substitutions, inspections, etc.
      d. Scheduling of the work.
      e. Contractor's comments on any inaccuracies or ambiguities found in the Contract Documents.
      f. To discuss any and all questions by the Contractor to make sure that the Contractor is aware of all conditions affecting the work prior to the awarding of the Contract.

2. For the General Contractor to discuss with the Owner, Architect, subcontractors, and other interested parties the design, methods, organization, schedule of the work, contract requirements, mutual understandings relative to the Contract Documents, and procedures of the Administration of the Contract. Items to be discussed include, but are not limited to:
   a. Construction Schedule.
   b. Project Coordination: Designation of responsible personnel.
   c. Procedures and processing of submittals, pay requests, change orders.
   d. Record Document maintenance.
   e. Hazardous materials.
   f. Review of existing building conditions.

B. Date of Conference: Before actual construction begins, when scheduled by the Architect.

C. Attendance: The Owner, Architect, Contractor, and his superintendent shall attend as well as subcontractors and suppliers designated by the Owner, Architect, or Contractor.

D. Place: To be designated by the Owner.

1.4 PROJECT COORDINATION SUBMITTALS

A. Schedule of Values: Submit within 15 days from Award of Contract. Provide in format approved by the Owner's Representative.
   1. Format: Identify each line item with number and title of the corresponding SPECIFICATION SECTIONS. Indexing by general division is not acceptable.
   2. Keep Schedule of Values current with progress of work, and provide as integral part of Application for Payment. Revise schedule to list Change Orders for each Application for Payment.
   3. Breakdown per phasing (if included in project). Submit via E-Builder.

B. Construction Schedule:
   1. Submit Construction Schedule in line with published schedule contained in these bid documents within 20 days of Award of Contract and provide update at every week subcontractor coordination meeting. Schedule shall consist of a horizontal bar chart with separate designation for each major trade or operation, identifying first workday of each week. Clearly designate Critical Path of construction.
   2. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Show projected percentage of completion for each item of work as of the first of each month. Submit via E-Builder.

1.5 SUBMITTAL PROCEDURES

A. Submit information as required by each Section of the Specification. Coordinate with construction schedule and allow sufficient time for Architect and consultant review. Allow time for potential disapproval and re-submittal.
   1. The Contractor should expect a minimum review/processing time of seven (7) days for the Architect review and a minimum of fourteen (14) days for Architect's consultant and Owner's review.

1.6 SHOP DRAWINGS

A. Submit drawings via E-Builder.

1.7 SAMPLES

A. Submit full range of manufacturer's standard colors or custom colors where specified, textures and patterns for Architects final selection. Submit via E-Builder unless sample cannot be adequately reviewed without seeing the physical sample.

B. Submit samples to illustrate functional characteristics of the product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.

C. Include identification on each sample, giving full information.

D. The Contractor shall clearly mark and identify applicable products, models, options and other data on manufacturer's standard data or catalog cuts. The Contractor shall provide supplemental data or information unique to this project. Where specified in other sections of the specification, assembly, installation, start-up, adjusting and finishing. The Contractor shall submit supporting reference data, affidavits and certifications that products meet or exceed the specified requirements.

1.8 PRODUCT DATA

A. Mark each copy to identify applicable products, models, options, and other data; supplement manufacturer's standard data to provide information unique to the work.

B. Submit via E-Builder.

1.9 WARRANTIES

A. Prior to final payment, furnish one (1) digital submission of all warranties required for each item of materials where stipulated in the Contract Documents. Submit as part of the O&M deliverables.

1.10 LAYOUT OF THE WORK

A. The Contractor shall survey and verify the conditions of the existing project site. The purpose of the survey is to record existing conditions prior to the construction for comparison with the Contract Documents.

B. The Contractor shall report any conflicts to the Architect prior to the start of the Work. The Architect will provide revisions to the Contract Documents or issue instructions to deal with conflicts.

C. The Contractor shall be responsible for remedying conflicts that could have been prevented by timely reviews of existing conditions. All remedies which vary from the Contract Documents shall be approved by the Architect and the Owner's Representative.

1.11 JURISDICTIONAL REPORTING REQUIREMENTS

A. Certification of occupancy shall not be issued prior to all inspections normally required in the course of construction by the Authority Having Jurisdiction.

1.12 PROGRESS MEETINGS

A. Purpose: Project meetings will be held each week, from beginning of construction to final acceptance, to discuss items of mutual interest regarding coordination and progress of the work.
   1. The Contractor shall fully brief the Architect and BSD Representative on the progress of the Work.

B. Day of Week: To be mutually determined by the Architect, Owner, and the Contractor.

C. Attendance: The Owner, Architect, Contractor, and his superintendent shall attend, or their representatives. Other subcontractors, suppliers, or manufacturer's representatives shall attend when requested by the Contractor, Owner, or Architect.

D. Place: Project site or as otherwise designated by the Owner.

E. Chairman: The Contractor shall chair the meeting.

F. Meeting Date Changes: Contact Owner’s Representative to request any changes in the meeting date; provide 24 hour notice. The Owner’s Representative will set the new date.

G. Meeting Report: The Contractor will later issue a meeting report to the Contractor and Owner. Submit via E-Builder.

H. The Contractor shall be responsible for notifying subcontractors and other representatives of scheduled construction meetings where their attendance is requested.

1.13 PRE-INSTALLATION CONFERENCES:

A. Pre-Installation Conferences: Contractor to arrange and conduct pre-installation conferences prior to initialization of work of major trades as required within the Specifications. Attendance shall include Owner’s representative, Contractor, major sub-contractor(s), and Architect. Include technical representatives of product manufacturers and others recognized as expert or otherwise capable of influencing success of the installation. Review significant aspects of requirements for the work. Record discussion and distribute as plan of action. Review procedures, distribute schedule and discuss requirements pertaining to the work. Designate responsible personnel. Conduct walkover inspection of existing site.

END OF SECTION

SECTION 01 31 23

PROJECT MANAGEMENT DATABASE (E-BUILDER)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Summary.

B. General Requirements.

C. System Requirements.

D. System Access.

E. System Use.

1.2 SUMMARY

A. Project Management Communications: The Owner, Contractor and Architect shall use the Internet web-based project management communications tool, E-Builder® ASP software and protocols included in that software during this project. The use of project management communications as herein described does not replace or change any contractual responsibilities of the participants.

B. Purpose: The intent of using E-Builder® is to improve project work efforts by promoting timely initial communications and responses and to reduce the number of paper documents while providing improved record keeping by creation of electronic document files.

1.3 GENERAL REQUIREMENTS

A. Project management communications is available through E-Builder® as provided by "E-Builder®" in the form and manner required by the Owner.

B. The project communications database is on-line and fully functional. User registration, electronic and computer equipment, and Internet connections are the responsibility of each project participant. The sharing of user accounts is prohibited.

C. Support: E-Builder® will provide on-going support through on-line help files.

D. Authorized Users: Access to the web site will be by individuals who are licensed users as required by the Owner.

E. Licenses Granted by Owner: Owner shall pay for and provide licenses for the following members of the project team:
   1. Lead member and backup member of Architect's design team responsible.

2. Contractor's project manager or lead member and a back up member of Contractor's project staff.
3. Others as deemed appropriate by Owner.

1.4 SYSTEM REQUIREMENTS

A. System Configuration:
1. PC system 500 MHz Intel Pentium III or equivalent AMD processor.
2. 128 MB Ram .
3. Display capable of SVGA (1024 x 768 pixels) 256 colors display.
4. 101 key Keyboard .
5. Mouse or other pointing device.

B. Operating system and software configuration:
1. All software shall be properly licensed with vendors or developers. Use of “E-Builder” does not convey any rights or licensure for use of any software, hardware or internet service provider.
2. Software Configuration:
a. Most current version of Microsoft Internet Explorer (current version is a free distribution for download). This specification is not intended to restrict the host server or client computers provided that industry standard HTTP clients may access the published content.
b. Most current version of Adobe Acrobat Reader (current version is a free distribution for download).
c. Other plug-ins specified by E-Builder® as applicable to the system (current versions are a free distribution for download from www.e-builder.net).
d. Users are recommended to have properly licensed versions of the standard Microsoft Office Suite (current version must be purchased) or the equivalent.

1.5 SYSTEM ACCESS

A. Minimum Equipment and Internet Connection: In addition to other requirements specified in this Section, the Contractor shall be responsible for providing suitable computer systems for each licensed user at the users normal work location with high-speed Internet access, i.e. DSL, local cable company's Internet connection, or T1 connection.

B. Authorized users will be contacted directly by the web site provider, E-Builder®, who will assign the temporary user password.

C. Individuals shall be responsible for the proper use of their passwords and access to data as agents of the company in which they are employed.

1.6 SYSTEM USE

A. Owner's Administrative Users: Owner administrative users have access and control of user licenses and all posted items. DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE!

B. Improper or abusive language toward any party or repeated posting of items intended to deceive or disrupt the work of the project will not be tolerated and will result in deletion of the offensive items and revocation of user license at the sole discretion of the Administrative User(s). Costs incurred or associated with such issues shall be the financial responsibility of the party responsible for the transgression.

C. Communications: Communication for this project for the items listed below shall be solely through E-Builder®:
   1. RFI, Requests for Information.
   2. Change Order Requests.
   3. Architect's Supplemental Instructions.
   4. Calendar of Events (meetings, events, open houses, public site tours etc.).
   5. All other communication shall be conducted in an industry standard manner.

D. Document Integrity and Revisions:
   1. Documents, comments, drawings and other records posted to the system shall remain for the project record. The authorship time and date shall be recorded for each document submitted to the system. Submitting a new document or record with a unique ID, authorship, and time stamp shall be the method used to make modifications or corrections.
   2. The system shall identify revised or superseded documents and their predecessors.
   3. Server or Client-side software enhancements during the life of the project shall not alter or restrict the content of data published by the system. System upgrades shall not affect access to older documents or software.

E. Document Security: The system shall provide a method for communication of documents. Documents shall allow security group assignment to respect the contractual parties communication except for Administrative Users.

F. Document Integration: Documents of various types shall be logically related to one another and discoverable.

G. Notifications and Distribution: Document distribution to project members shall be accomplished both within the extranet system and via email as appropriate. Project document distribution to parties outside of the project communication system shall be accomplished by secure email of outgoing documents and attachments, readable by a standard email client.

H. Ownership of Documents and Information: All documents, files or other information posted on the system shall become the property of the Owner.

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 CONSTRUCTION PROGRESS DOCUMENTATION

A. Progress Schedules & Reports. The Contractor, within ten calendar days after being awarded the Contract, shall prepare and submit for the information of the BSD Representative and the Consultant a Progress Schedule in critical path management ("CPM") format satisfactory to the BSD Representative for the Work. The Progress Schedule shall conform to any requirements of the Specifications, shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, shall provide for expeditious and practicable execution of the Work, and shall be utilized and conformed to by the Contractor and its Subcontractors. Contractor shall comply with the Progress Schedule. The Progress Schedule is for District's benefit, and to the full extent permitted by law, changes to or variations from the Progress Schedule shall not entitle the Contractor to an extension of the Contract Time or increase of Contract Sum.

B. Meeting Minutes: Contractor shall be responsible for the preparation and distribution of meeting minutes. Submit via E-Builder.

C. Documentation of existing conditions
1. The Contractor will photograph existing conditions that could be damaged by construction. This will help the Owner and Architect to determine at the end of construction whether an area or item damage was preexisting or caused by the Contractor. Submit existing photos via E-Builder.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Submit overall construction schedule, 3-week work schedule, shop drawings, product data, samples, schedule of values, record documents, and products list as specified.
   1. Submit to Architect via E-Builder only through Contractor.
   2. Do not submit directly to Consulting Engineers without prior approval by the Architect for each individual submittal.
   3. The Architect/Consultant will forward a marked up set of submittals to the District Representative for review and approval after review by the Architect and Consultant(s).

1.2 QUALITY ASSURANCE

A. Within 15 days of the Award of Contract, submit schedules of values, list of principal subcontractors and suppliers, progress schedule, copies of building permits, and similar start-up authorization via E-Builder.

PART 2 PRODUCTS

2.1 CONSTRUCTION SCHEDULE

A. Content: Within 20 days of the award of contract, submit a comprehensive progress schedule indicating a time bar for each significant category of work to be performed via E-Builder. Show product and installation dates for major products. Show dates for each construction activity, Substantial Completion and punch list preparation, Final Completion, and Occupancy.

B. Designate in the Construction Schedule, the dates for submission and review of Shop Drawings, product data and samples that are needed for the product. Show critical submittal dates or prepare a separate coordinated listing of critical submittal dates.
   1. Any critical path submittals shall be identified as critical in the E-Builder Submittal Module.

C. Updating: Indicate progress of each activity and show revised completion dates. Provide listing of current and anticipated accelerations and delays. Describe proposed corrective action when required. Revise at intervals matching payment requests and redistribute with each payment request.

2.2 MEETING MINUTES

A. Meeting minutes to be prepared by Contractor and distributed to all meeting attendees via E-Builder with 2 days. Action items uploaded to E-Builder by the end of that same day.

2.3 SCHEDULE OF VALUES

A. Submit a Schedule of Values covering various parts of work including quantities aggregating the total sum of the Contract to E-Builder. Show dollar value and percent of total for each unit of work scheduled. This Schedule will be the basis for the Contractor's Application for Payment.

B. Submit on the latest edition of AIA Document G703, Continuation Sheet, within 15 days of Award of Contract and with each payment request. Revise each time schedule is affected by change order or other revision.

C. Upon request by the Architect, support values given with data that will substantiate their correctness.

2.4 PAYMENT REQUESTS

A. Submit a request each calendar month to E-Builder. Use the latest edition of AIA Document G702, Application and Certificate for Payment, fully completed, notarized, and executed and G703, Schedule of Values.

2.5 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. General:
1. Review, stamp with Contractor's stamp, and sign each submittal to certify Contractor has reviewed submittal for compliance with Contract Documents prior to submitting to the Architect. Submittals issued without the Contractor's review may be returned to the Contractor without being reviewed by the Architect. Submit to E-Builder.
2. Provide 3" x 4" clear space on each submittal for the Architect's stamp.
3. Provide additional copies as required by governing authorities.

B. Shop Drawings-Submit via E-Builder.
1. Submit shop drawings showing connections, details, dimensions, finishes, fasteners, etc.
2. Maintain 1 print as a mark-up copy for the "Record Drawings".
3. In the event that the submittal is a partial submittal, identify related shop drawings to be submitted at a later date.

C. Product Data-Submit via E-Builder.
1. Submit manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other description data on manufactured products and systems.
2. Mark to indicate the actual product to be provided. Show selections from among options in the manufacturer's printed product data.
3. Maintain 1 copy at the project site for reference purposes.

D. Office Samples-Submit via E-Builder:
1. Maintain one returned set at the project site for purposes of quality control comparisons.
2. Sample submittals are for Architect's observation of color, texture, pattern, and "kind".

E. Miscellaneous Submittals: Submit via E-Builder of miscellaneous submittals as follows:
1. Warranties: Submit executed copy for maintenance manual.

2. Field Records: Submit for inclusion in the submittal of "Record Documents".
3. Maintenance Manuals.
4. "Contractor Redlines": Submit a scanned PDF of the original maintained marked-up prints.
5. Construction Schedule and Schedule of Values.

2.6 3-WEEK WORK SCHEDULE

A. Each week provide to the Architect a 3-Week Work Schedule on a form approved by the Architect. Submit via E-Builder. Each 3-Week Work Schedule is to show the description of all phases of the work to be accomplished during the week submitted and the 2 following weeks. The 3-Week Work Schedule is to be updated every week and presented to the Architect. Indicate any suspected utility service interruption on the 3-Week Work Schedule.

PART 3 EXECUTION

3.1 CONTRACTOR'S SUBMITTAL

A. Review submittals prior to submission and provide stamp of approval signed or initialed by the Contractor indicating the Contractor has inspected the submittals and certifying that they are complete, correct, in compliance with the Contract Documents and suitable for the Project.

B. Verify field measurements and other field construction criteria.

C. Submit submittals required by each Specification Section to the Architect. Notify the Architect in writing at time of submission of deviation in submittals from requirements of the Contract Documents.

D. The Architect/Consultant shall provide a marked up set of submittals to the District Representative for review and approval after review by the Architect/Consultant.

E. Submittals shall be arranged by specification section with the specification sections identified on divider tabs. Product Submittals shall include catalog data sheet clearly marking the following information for the exact equipment being installed: manufacturer, type, style, complete catalog number, dimensions, physical description, and specifications for each item and each option submitted. Submittals shall reference equipment number as designated on Project Drawings, equipment schedules, or specifications for any and all equipment identified by unique designation in project documents. Contractor must submit the proposed startup documentation for the equipment upon submittal for that equipment. Include the manufacturer’s recommended installation and startup procedures with associated checklists for each unique piece of equipment under a separate tab titled “Installation/Startup”. These procedures and forms shall be for the specific piece of equipment to be provided.
   1. Submittals shall be divided out and listed separately in the E-Builder Submittal Register, and each submittal shall be uploaded separately to the Submittal in E-Builder.

F. Submittals to be provided as a complete package.

3.2 ARCHITECT'S REVIEW

A. Architect will review submittals for design concept and conformance with the Contract Documents and return submittals to the Contractor for distribution with corrections noted thereon.

B. Stamp: The Architect will stamp each submittal to be returned with a uniform, self-explanatory action stamp, appropriately marked and executed to indicate the status of the submittal. The stamp indicates and requires the follow action:
   1. No Exception Taken: No further action is required.
   2. Make Corrections Noted: Make the corrections upon fabrication of the material only.
   3. Rejected: The material submitted is not acceptable and another material submission is required.
   4. Revise and Resubmit: The material submittal is not acceptable, and it is to be elaborated upon or corrected and resubmitted prior to material fabrication.
   5. Submit Specified Item: Submittal is rejected, and the material specified is to be submitted.
   6. Checking is only for general conformance with the design concept of the Project and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for dimensions which shall be confirmed and correlated at the job site, fabrication processes and techniques of construction, coordination of Contractor’s work with that of all other trades and the satisfactory performance of Contractor’s work.

C. Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Architect's review of submittals unless the Contractor has made written request for the deviations and the Architect gives written acceptance of specific deviations requested.

3.3 CORRECTIONS

A. Immediately incorporate all required corrections in the submittals and resubmit for further review, if required.

3.4 TIME SCHEDULE FOR SUBMITTALS

A. Construction Schedule: Submit to the Architect via E-Builder no later than 20 calendar days after Award of Contract.

B. Shop Drawings: Submit to the Architect via E-Builder for review. The Architect will review within 15 calendar days. Schedule submissions to allow ample time for ordering and delivery of materials after review.

C. Product Data: Submit to the Architect via E-Builder for review. The Architect will review within 15 calendar days. Schedule submissions to allow ample time for ordering and delivery of materials after review.

D. Office Samples: Submit to the Architect via E-Builder for review. The Architect will review within 15 calendar days. Schedule submissions to allow ample time for ordering and delivery of materials after review.

E. Schedule of Values: Submit to the Architect via E-Builder no later than 15 calendar days after receipt of the Notice to Proceed.

3.5 SUBMITTAL SCHEDULE

A. Submittals required by Specifications and the Drawings shall be made regardless of whether or not they are scheduled herein. Each specification section should be reviewed for exact submittal requirements. All submittals must be reviewed by the Architect prior to being used and must be submitted in sufficient time to preclude a delay in meeting the approved Construction Schedule.

SECTION NUMBER	SECTION NAME	REQUIRED SUBMITTAL
01 29 00	Payment Procedures	Applications for Payment Schedule of Values
01 31 00	Project Management and Coordination Shop Drawings	Schedule of Values Construction Schedule Color Submittal Samples Site Staging Plan Product Data Warranties Washington County Reporting Requirements
01 32 00	Construction Progress Documentation	Progress Schedules & Reports
01 33 00	Submittal Procedures	Construction Schedule Schedule of Values 3 Week Work Schedule
01 45 00	Quality Control	Reports
01 61 00	Common Product Requirements	Manufacturer’s Instructions
01 77 00	Closeout Procedures	Prerequisites to Substantial Completion Prerequisites to Contract Closeout
01 78 00	Closeout Submittals	Closeout Submittal Log Contractors Redlines/ Record Documents Contractors Redlines/ Record Specifications Record Product Data Miscellaneous Record Submittals Warranties Operation and Maintenance and Manuals Release of Liens Certificate of Occupancy
07 92 00	Joint Sealants	Product Data MSDS Sheets

		Closeout Submittals Guarantee Non-Staining Warranty
08 20 00	Solid Core Wood Doors	Shop Drawings Product Data
08 41 00	Aluminum Framed Entrances	Shop Drawings Product Data Guarantee
08 71 00	Door Hardware	Hardware Schedule Templates Surface Door Closers Factory Guarantee
08 81 10	Glass Glazing	Shop Drawings Product Data Guarantee
09 29 00	Gypsum Board	Product Data Product Preparation Instructions and Recommendations Storage and Handling Requirements
09 51 13	Acoustical Panel Ceilings	Product Data Product Preparation Instructions and Recommendations Storage and Handling Requirements
09 65 13	Resilient Wall Base	Product Data Product Preparation Instructions and Recommendations Storage and Handling Requirements
09 68 00	Carpet Flooring	Product Data Product Preparation Instructions and Recommendations Storage and Handling Requirements
09 91 00	Painting	Product Data Office Samples Product Preparation Instructions and Recommendations Storage and Handling Requirements Installation Methods Finish Schedule Date Schedule Closeout Submittals Extra Stock Manufacturer’s Warranty
22 00 00	Basic Plumbing Requirements	Performance Data and Technical Information Shop Drawings Record Drawings Warranty
23 00 00	Basic HVAC Requirements	Performance Data and Technical Information

		Shop Drawings Record Drawings Warranty
26 00 00	Electrical General Provisions	Warranty Electrical Data Installation and Record Drawings Cost Breakdown of Electrical Work Record Information

END OF SECTION

SECTION 01 35 00

SPECIAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Asbestos: No asbestos containing materials may be used in the construction or remodel of any facilities located within the Beaverton School District.

1. The Beaverton School District retains an Asbestos Abatement Consultant to test presumed asbestos containing material (PACM) and to oversee all asbestos abatement work that takes place within our facilities. This consultant is to be an integral part of the construction process. They are to be notified before any asbestos abatement takes place within the designated facility. If material is found during the construction process that has not been specifically identified as asbestos containing material, but is presumed to contain asbestos, then a bulk sample must be sent for laboratory analysis before the material may be removed or repaired. The Asbestos Abatement Consultant is charged with keeping records which are forwarded to the AHERA Designated Person for the Beaverton School District. This information is crucial to the maintenance of the BSD asbestos database for all facilities.
2. The Contractor must have a full-time construction project manager on site to oversee the construction takes place within the facility. It will be the responsibility of the construction project manager to notify the Asbestos Abatement Consultant in conjunction with the Abatement Contractor so that the Asbestos Abatement Consultant is on site to oversee the abatement of the asbestos and to document the material removed for the BSD asbestos database. Asbestos abatement is to be completed by the General Contractor and the cost to be incurred by the General Contractor.
3. Procedures to follow if there has been an asbestos release event
    a. Shut down all heating, ventilation and air conditioning units that supply return or draw air to, or from the area in question.
    b. Keep the area in question closed off. Post signs to restrict any person from accidentally walking into the contaminated area.
    c. Notify the BSD Representative and the Asbestos Abatement Consultant for the District. They will make the arrangements for the clean up of the asbestos contamination.
4. Construction Contractor shall be held liable for any actions of its agent, personnel or subcontractors and all costs, expenses, damages, claims and causes of action rising out of an asbestos release that occurs during performance of their work. All costs incurred by the District to clean up the asbestos release shall be the responsibility of the Contractor.

B. Environmental pollutants:

1. Contractor shall obtain the District's written consent prior to bringing onto the work site any environmental pollutants or hazardous substances or materials.
2. Properly handle, use, and dispose of all environmental pollutants and hazardous substances or materials brought onto the work site, in accordance with all applicable federal, state, or local statues, rules, or ordinances.
3. Be responsible for any and all spills, releases, discharges, or leaks of (or from) environmental pollutants or hazardous substances or materials which Contractor has brought on the work site.
4. Promptly clean up, without cost to the District, such spills, releases, discharges, to the District's satisfaction and in compliance with all applicable federal, state, or local statutes, rules, or ordinances.
5. Contractor shall be liable for any and all costs, expenses, damages, claims and causes of action, or any of them related to or arising out of a spill, release, discharge

or leak of (or from)any environmental pollutant or hazardous substance or material, to the extent such spill release, discharge, or leak was caused or contributed to by the Contactor's negligence or failure to perform in accordance with the contract documents.

6. Contractor must report, when safe to do so, all quantity releases via telephone to the BSD Representative. A written follow-up report is to be submitted to the BSD Representative within 48 hours of the telephone notification. At a minimum, the report must contain the following information:
   a. Description of times released (identity, quantity, and all other documentation required by law).
   b. Whether amount of items released is reportable to EPA/DEQ, and if so, when it was reported.
   c. Exact time and location of release, including a description of the area involved.
   d. Containment procedures initiated.
   e. Summary of communications about the release that Contractor has had with members of the press or State officials other than District.
   f. Description of clean-up procedures employed, or to be employed at the site, including disposal location of spill residue.
   g. Personnel injuries, if any, resulting from or aggravated by, the release.

C. Environmental Clean-up:
   1. As part of the Final Completion Notice, or as a separate written notice submitted with or before the Notice of Completion, the Contractor shall notify the District that all environmental pollution clean-up which was performed as part of this construction project has been disposed of in accordance with all applicable rules, regulations, laws and statutes of all agencies having jurisdictions over such environmental pollution. The notice shall indemnify and hold harmless the District from any claims resulting from the disposal of the environmental pollution including removal, encapsulation, transportation, handling, and disposal.
   2. Construction Contractor will be held responsible for any and all releases of environmental pollution during performance of the Contract that occur as a result of, or are contributed to, by actions of its agent, personnel, or subcontractors.
   3. All costs incurred by the District in meeting applicable regulations, in correcting any unhealthy or unsafe working conditions, or costs incurred by the District to complete any of the Contractor's work, will be charged to the Contractor.

D. Hazardous Materials:
   1. In the event that PCB ballasts, lead paint, heavy metals, underground storage tanks, or other hazardous materials are encountered during construction, contact the BSD Representative who will notify BSD Environmental Management. Separate arrangements will be made to remove the hazardous material and clean the facility in a manner that is safe and consistent with Beaverton School District policies and all regulatory authorities.
   2. Any time "assumed lead" painted surfaces are disturbed the work must be done by a certified firm with a trained and certified contractor. In addition the areas of the building that will be affected must be posted with appropriate signage warning of the potential hazard and parents and guardians of the children must receive information about the renovation work that is planned an EPA pamphlet about renovation.

E. In the event that an event occurs contact the National Response Center and obtain a file report number that will be forwarded to the District Representative.

END OF SECTION

SECTION 01 35 26

SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 SAFETY REQUIREMENTS

A. The following requirements, as applicable, apply to Work specified herein.

1. Associated General Contractors of America, Inc., “Manual of Accident Prevention in Construction.”

2. Workmen’s Compensation Board “Safety Code for Construction Work.”

3. Oregon State Employment Act Safety Requirements.

4. Oregon Occupational Safety and Health Act (OROSHA) requirements, as applicable, apply to Work specified herein.

END OF SECTION

SECTION 01 35 53

SECURITY PROCEDURES

PART 1 GENERAL

1.1 CONSTRUCTION/MAINTENANCE BUILDING SECURITY RULES

A. The Contractor shall enforce strict discipline and good order among the Contractor's employees, Subcontractors, and other persons carrying out the contract on District property. The District may require that the Contractor immediately remove from the project site and District property any employee or other person carrying out the contract that the District considers objectionable.

B. District Personnel (i.e., Building Administrator, Custodian, or a building monitor etc.) must be present when a contractor is performing work within an existing school facility.

C. Only District Personnel will deactivate the security system upon arriving and reactivate the system when they leave the facility.

1. If the responsible District Personnel for a particular day changes during the day, the District Personnel shall coordinate this change in responsibility and advise the Contractor's superintendent.

D. Contractor personnel will not be furnished District security badges and/or access codes to the Building security system. All personnel under the employment of the Contractor and its subcontractors that travel to or spend time at the project site are to wear ID badges while on the work site. ID badges are to contain:
1. Individuals full name.
2. Individuals company affiliation.

E. The Contractor shall have a responsible party such as a superintendent, foreman, or supervisor on site during any work being performed by either their own forces or that of their subcontractors.

F. The superintendent shall check in with the responsible District Personnel upon arrival and advise when all work is complete, contract personnel have left, and the area is secure.

G. The Contractor's superintendent shall be responsible for security in areas where work is being performed as well as ingress and egress to that area.

H. At the BSD Representative's discretion, the superintendent may be issued a building key to allow access to area's where work is being performed.

I. The superintendent shall maintain a daily log defining what areas within the building were accessed by Contractor personnel, which personnel from their firm were in the building, and which subcontracting firms were in the building.

J. Each of the Contractor's employees, Subcontractors' employees, and principals/owners involved at the site may, at the option of the District, be subject to a security check, at any time, through the Beaverton Police Department or other venue.

K. Contractor shall pay and perform or have performed criminal background checks for every employee on all active campus (i.e., children are present) projects prior to that employee's admittance to the project site. Once an employee passes the criminal background check they will create an ID badge which they must wear while they are on site at all times. Contractor

may be fined up to $500 for every worker working on site without the proper ID badge. The following are the convicted crimes that may not appear on the background check.

CONVICTIONS RENDERING INELIGIBILITY per ORS 342.143

- Aggravated Murder or Murder
- Assault in the First Degree
- Kidnapping in the First Degree
- Rape in the First, Second, or Third Degree
- Sodomy in the First, Second, or Third Degree Second Degree
- Unlawful Sex Penetration in the First or Second Degree
- Arson in the First Degree
- Sexual Abuse in the First, Second, or Third Degree
- Contributing to the Sexual Delinquency of a Minor
- Sexual Misconduct
- Public Indecency
- Bigamy
- Incest
- Child Neglect in the First Degree
- Endangering the Welfare of a Minor
- Using Child in Display of Sexually Explicit Conduct
- Sale or Exhibition of Visual Reproduction of Sexual Conduct by a Child
- Paying for Viewing of Sexual Conduct Involving a Child
- Encouraging Child Sex Abuse in First, Second or Third Degree
- Possession of Materials Depicting Sexual Explicit Conduct of a Child in the First or Second Degree
- Arson in the First Degree
- Robbery in the First Degree
- Treason
- Abuse of a Corpse in the First Degree
- Prostitution, Promoting Prostitution, or Compelling Prostitution
- Sadomasochistic Abuse or Sexual Conduct in a Live Show
- Furnishing, Sending, or Displaying Obscene Materials to Minors
- Exhibiting an Obscene Performance to a Minor
- Disseminating Obscene Materials
- Publicly Displaying Nudity or Sex for Advertising Purposes
- Distribution of Controlled Substance to Minors
- Manufacture or Delivery of Controlled Substance to Minor or Student within 1000 Feet of a School
- Attempt to Commit Any of the Above-Listed Crimes

L. Smoking and any use of tobacco products is not allowed within 50 feet of the campus property. Contractor may be fined up to $500 for each incident of tobacco use within the area of work by the Contractor or Subcontractors.

M. Firearms are not allowed on campus property. Law enforcement will be contacted if any contractor personnel are in possession of a firearm on site. (This includes firearms locked up in a vehicle.)

N. Abusive, inappropriate, and/or foul language is strictly prohibited on active campus projects. Employees who abuse this rule will be asked to leave the project site.

O. Contractor is responsible to maintain security of building per BSD operating procedures. Failure to do so will result in a fine being levied by BSD.

END OF SECTION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Permits and Fees**:**

1. BSD will pay the actual cost of the building permit, permanent utility connection permits and fees, and permits required for construction of work in the public right and associated bonds or assurances. Any other required permits including trade permits, deferred submittals, and governmental fees, licenses and inspections necessary for proper execution and completion of the Work, and any penalties, extensions or fines assessed to the above permits or fees shall be paid by the Contractor.

2. The Contractor shall secure and closeout all permits. BSD will pay all system development charges, traffic impact fees, land use fees, building plan review and application fees applicable to the project.
   1. Typical Permits and Fees to be paid by Contractor as a part of the cost of the work, including but not limited to:
      a. Deferred Submittal Fees
      b. Demolition Permit Fee
      c. Other permits or fees required during the construction phase

B. The Contractor shall be responsible for securing and paying for all permits and fees in a timely manner so not to impede the progress of the Work.

C. BSD will pay land use fees and the initial building and/or plan check fees. Contractor shall pay for design build or subsequent application and/or plan check fees.

END OF SECTION

SECTION 01 42 00

REFERENCES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Codes, Ordinances and Regulations.

1.2 RELATED DOCUMENTS

A. Bidding Requirements.

B. Conditions of the Contract.

C. Drawings and Specifications.

1.3 CODES, ORDINANCES AND REGULATIONS

A. All work shall comply with the Codes, Ordinances and Regulations
   1. General Construction Work:
      a 2019Oregon Structural Specialty Code.
      b State of Oregon Rules and Regulations of the State Board of Health.
      c Local Air Pollution Control and Agency and/or the Department of Environmental Quality, State of Oregon.
      d Department of Labor and Industries, State of Oregon.
      e Oregon Occupational Safety and Health Administration.

B. Comply with all applicable fire codes, plumbing codes, mechanical codes and electrical codes.

C. Comply with requirements of Washington County and State of Oregon Departments of Health. Comply with the requirements of the State of Oregon regarding the listing and handling of hazardous materials.

D. Comply with requirements of the State of Oregon, Department of Environmental Quality.

E. All temporary facilities and construction procedures shall comply with requirements of local and State Health codes and the United States Department of Labor, Occupational Safety and Health Administration (OSHA) Standards.

1.4 SPECIFICATION OF HIGHER STANDARD

A. Drawings and Specifications govern whenever Drawings and Specification require higher standards than are required by referenced codes and regulations.

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 GENERAL

1.1 WORK INCLUDED

A. The Owner will select, employ, and pay for services of an independent testing laboratory to perform inspections, sampling, testing, and other services required by the local building code and the Project Manual.
   1. Special inspections by independent inspection and testing laboratory services shall be provided by the District.
   2. The District may contract an independent consultant to review design and construction of the building envelope with particular emphasis in the areas of water intrusion.

B. Specific quality control requirements are specified in individual Project Manual Sections.

C. Inspection and testing services are intended to determine compliance of the Work with requirements specified.

D. Refer to the Structural Notes on the Drawings (Sheet S0.2) for the special inspection and testing plan.

1.2 SUBMITTALS

A. Submit a certified written report of each inspection, test, or similar service to the Architect, Structural Engineer, Contractor, and the Owner. Include additional copies of each report to governing authorities when so directed.

B. Report Data: Written inspection or test reports shall include:
   1. Name of testing agency or test laboratory.
   2. Date and location of samples, tests, or inspections.
   3. Names of individuals present.
   4. Complete inspection or test data.
   5. Test results.
   6. Interpretations.
   7. Recommendations.

PART 2 PRODUCTS

2.1 SCOPE

A. Nature and Scope of Testing Services: In accordance with the requirements of governing authorities having jurisdiction over the work and as otherwise specified and consistent with reasonable standards of engineering practice.

PART 3 EXECUTION

3.1 TESTING LABORATORY'S RESPONSIBILITIES

A. Conduct, interpret tests, and report deviations or conditions that may lead to deviations from the Contract Documents to the Architect immediately by telephone.

B. State in each test report whether or not tests showed conformance with requirements of the Contract Documents and specifically note deviations, if any, from these requirements.

3.2 CONTRACTOR'S OBLIGATIONS

A. Cooperate with any representative of the Owner or the Testing Laboratory. Furnish tools, materials, equipment, and assistance.

B. Notify the Architect, Testing Laboratory, and Owner 48-hours prior to each expected placement, installation, or fabrication phase requiring inspection tests as indicated herein.

C. Where tests reveal defects requiring replacement, retest as required under this Contract at no change in Contract amount and reimburse Owner, Architect, and Consultants costs for preparation and supervision.

D. When the initial tests indicate non-compliance with the Contract Documents, any subsequent retesting occasioned by non-compliance shall be performed by the same agency and the cost thereof borne by the Contractor.

E. Representatives of the testing agency shall have access to the work at all times. The Contractor shall provide facilities for such access in order that the agency may properly perform its functions.

F. Any testing laboratory stand-by time due to the Contractor's delays shall be paid for by the Contractor.

G. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

3.3 TEST OBSERVATIONS

A. If the Architect wishes to observe the inspections, tests, or approvals required by this paragraph, he will do so promptly and, where practicable, at the source of supply.

B. Neither the observations of the Architect in his Administration of the Construction Contract, nor inspections, tests, or approvals by persons other than the Contractor shall relieve the Contractor from his obligations to perform the Work in accordance with the Contract Documents.

3.4 EVALUATION OF TESTS AND INSPECTIONS

A. Results of laboratory or field control tests and inspections shall be the principal basis upon which satisfactory completion of the Work shall be judged.

B. If results of tests and inspections indicate the Work is below requirements of the Contract Documents, that portion of the Work is subject to condemnation.

3.5 ADJUSTMENTS

A. Remove and replace Work so condemned at Contractor's expense including costs of subsequent tests and inspections until the Work meets requirements of the Contract Documents.

END OF SECTION

SECTION 01 51 00

TEMPORARY UTILITIES

PART 1 GENERAL

1.1 DESCRIPTION

A. Remodels and Renovations: BSD will provide access to water and electrical as required. Contractor to provide all other temporary utilities.

B. Contractor to provide all temporary job site facilities, materials, systems and services as required to complete the work and as hereinafter listed. Upon completion of the work, remove all temporary structures and materials. All necessary temporary facilities shall be furnished and paid for by the subcontractor unless specifically noted herein to be paid for by the Owner. All temporary facilities to be in place prior to construction.

1.2 SITE MAINTENANCE

A. Progress Cleaning:

1. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition ON A DAILY BASIS.
2. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces, prior to enclosing the space ON A DAILY BASIS.
3. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust ON A DAILY BASIS.
4. All construction debris and storage will be kept in an orderly, neat and organized fashion, and within the areas of work. Areas of work shall be free of construction debris ON A DAILY BASIS AT A MINIMUM.
5. At existing building sites, Contractor shall provide secured construction dumpsters and shall not intermingle trash with school dumpsters.

END OF SECTION

SECTION 01 52 00

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 DESCRIPTION

A. Contractor to provide drawing of acceptable areas for contractor staging, trailer locations and contractor parking on site plan(s). Owner will review.

B. Project Personal Identification. All contract personnel shall wear an ID badge that is a distinctive color with the word “Contractor” on the badge. The badge must be worn by any contract personnel within existing buildings. Contractor’s Superintendent to issue badges and maintain process.

1.2 SANITARY FACILITIES

A. Workmen will not be permitted to use existing toilet facilities of the existing building. Provide portable facilities and drinking water as required for workmen. Keep facilities clean and in sanitary condition. Remove from the site upon completion of the Work.

B. Comply with governing regulations including safety and health codes for the type, number, location, operation, and maintenance of fixtures and facilities.

C. Supply toilet tissue, hand sanitizer, and similar disposable materials as appropriate for each facility. Provide covered waste containers for used material.

1.3 TEMPORARY TELEPHONE

A. Contractor shall not use existing phone service. A separate cell and network service will need to be provided by the Contractor at the job site office.

1.4 TEMPORARY WATER

A. Existing water services may be used. Make temporary connection, as required. Exercise control over usage to conserve water.

1.5 TEMPORARY ELECTRICAL POWER SERVICE

A. Contractor to provide temporary power, phone & data service for job trailer and for construction work. Existing electrical services not to be used if at all possible. Contractor to establish a utility allowance to cover cost of services.

B. Provide temporary lighting throughout construction period as required by governing agencies.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 INSTALLATION

A. Use qualified tradesmen for installation.

B. Locate temporary services and facilities where they will serve the project adequately and result in minimum interference with the Work.

C. Temporary Utility Installation:
   1. Engage the local utility company to install temporary service or to make connections to existing service.
   2. Arrange with the companies and existing users for an acceptable time when service can be interrupted to make connections.
   3. Establish a service implementation and termination schedule. As early as possible change to use of permanent service, to enable removal of the temporary utility, and to eliminate any possible interference with completion of the Work.
   4. Provide adequate capacity at each stage of construction.
   5. Prior to availability at the site, provide trucked-in services for start up of construction operations.
   6. Obtain and pay for easements required to bring temporary utilities to the site where the Owner's easement cannot be utilized for that purpose.

3.2 OPERATION, TERMINATION, AND REMOVAL

A. Supervision:
   1. Limit availability of temporary services and facilities to essential and intended uses to minimize waste and abuse.
   2. Do not permit temporary installations to be abused or endangered.

B. Maintenance:
   1. Operate and maintain temporary services and facilities in good operating condition and in a safe and efficient manner until removal is authorized.
   2. Do not overload services or facilities.
   3. Protect from damage by freezing temperatures and similar elements.
   4. Do not allow unsanitary conditions, public nuisances, or hazardous conditions to develop or persist on the site.
   5. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24 hour basis where required to achieve indicated results and avoid the possibility of damage to the Work or to temporary facilities.

3.3 TERMINATION AND REMOVAL

A. Remove each temporary service and facility promptly when need has ended, or when replaced by use of a permanent facility, but no later than Substantial Completion.

B. Complete, or if necessary, restore permanent work delayed because of interference with the temporary service or facility.

C. Repair damaged work, clean exposed surfaces, and replace work that cannot be repaired.

D. At Substantial Completion, clean and renovate permanent services and facilities that have been used to provide temporary services and facilities during the construction period.

END OF SECTION

SECTION 01 53 00

TEMPORARY CONSTRUCTION

PART 1 GENERAL

1.1 SITE MAINTENANCE

A. Burning or burying of rubbish and waste materials on site is prohibited.

B. Disposal of volatile fluid wastes (such as mineral spirits, oil or paint thinner) in storm or sanitary sewer systems is prohibited. The washing/ rinsing of concrete trucks is prohibited onsite.

C. Keep site and surrounding areas clear of accumulations of waste material and rubbish resulting from operations under this Contract. Remove waste from site systematically during the progress of construction and immediately upon completion of Work.

1.2 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Provide a neat and uniform appearance in temporary construction and support facilities acceptable to the Architect and the Owner.

B. Locate field offices, storage and fabrication sheds, and other support facilities for easy access to the Work.

C. Make the change-over to use of permanent services and facilities at the earliest feasible date to minimize hazards and interferences with performance of the Work.

D. Maintain field offices, storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, recycling bins, and project identification and temporary signs until near Substantial Completion. Immediately prior to Substantial Completion remove these facilities. Personnel remaining at the site after Substantial Completion will be permitted to use permanent facilities, under restricted use conditions.

1.3 TEMPORARY HEAT

A. Provide temporary heat where needed for performance of the Work, for curing or drying of recently installed work, or for protection of work in place from adverse effects of low temperatures or high humidity.

B. Provide UL or FM tested and labeled heating units known to be safe and without adverse effect upon work in place or being installed.

C. Coordinate with ventilation requirements to produce the ambient condition and minimize fuel or energy consumption.

D. Maintain a minimum temperature of 45°F in permanently enclosed portions of the building and areas where finished Work has been installed.

E. Except where use of the permanent heating system is available and authorized, provide properly vented self-contained LP gas or fuel oil heaters with individual space thermostatic control for temporary heat.

F. Do not use open burning or salamander type heating units.

G. Minimum Interior Ventilation: Provide local exhaust ventilation to prevent harmful dispersal of hazardous substances into the atmosphere at all times. Provide ventilation for materials being cured.

1.4 STORAGE AND FABRICATION SHEDS

A. Install storage and fabrication sheds as required to accommodate the Work. Maintain temperatures and ventilation as required for materials being stored.

B. Sheds may be open shelters or fully enclosed spaces. Where fully enclosed, provide one ABC Type portable fire extinguisher in each shed.

1.5 FIRST AID SUPPLIES

A. Provide required first aid facilities. Comply with governing regulations and recognized recommendations within the construction industry.

1.6 MISCELLANEOUS SERVICES AND FACILITIES

A. Design, construct, and maintain miscellaneous services and facilities as needed to accommodate performance of the work, including temporary stairs, ramps, ladders, staging, shoring, scaffolding, temporary partitions, waste chutes, and similar items.

1.7 TEMPORARY FIRE PROTECTION

A. Until fire protection needs may be fulfilled by permanent facilities, install and maintain temporary fire protection of the types needed to protect against losses.

B. Comply with recommendations of NFPA Standard 10.

C. Locate fire extinguishers where most effective. Provide not less than one on each floor at or near each stairwell.

D. Provide type "A" fire extinguishers for temporary offices and spaces where there is minimal danger of electrical or flammable liquid fires. Provide type "ABC" dry chemical extinguishers elsewhere.

E. Store combustible materials in containers in fire-safe locations.

F. Review fire prevention and protection needs with local fire department officials and establish procedures to be followed in the event of fire.

G. At temporary water outlets, provide hoses of sufficient length to reach construction areas. Hang hoses with a warning sign indicating that hoses are for fire protection purposes and are not to be removed.

H. At the earliest feasible date, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel at the site on how to use facilities that may not be self-explanatory.

1.8 ENVIRONMENTAL PROTECTION

A. Conduct construction activities, and by methods that comply with environmental regulations, minimize the possibility that air, waterways, and subsoil might be contaminated or polluted, or that other undesirable effects might result from the performance of work at the site.

B. Avoid the use of tools and equipment that produce harmful noise.

C. Restrict the use of noise making tools and equipment to hours of use that will minimize complaints.

END OF SECTION

SECTION 01 55 00

VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.1 ACCESS, PARKING, AND TRAFFIC

A. Parking area for project visitors and construction personnel shall be at location designated by the Owner's Designated Representative.

B. Provide barricades, warning signs, flagmen, or other traffic regulators that may become necessary for protection of the public, construction personnel, or property.

C. Street/Parking Lot work to not impede flow of traffic.

D. The provision of designation signage and temporary traffic flow signage is required if construction changes parking and/or access flow.

END OF SECTION

SECTION 01 56 00

TEMPORARY ENCLOSURES

PART 1 GENERAL

1.1 TEMPORARY ENCLOSURE

A. Provide temporary enclosure of materials, equipment, work in progress, and completed portions of the Work to provide protection from exposure, foul weather, other construction operations, and similar activities.
   1. Subcontractor is solely responsible for security of their own tools and equipment.

B. Coordinate with ventilating, material drying, or curing requirements to avoid dangerous conditions.

C. Close openings through the floor or roof decks and other horizontal surfaces with substantial load-bearing wood-framed or similar construction.

1.2 COLLECTION AND DISPOSAL OF WASTES

A. Establish a system for daily collection and disposal of waste materials.

B. Enforce requirements strictly.

C. Do not retain collected materials longer than 7 days during normal weather or 3 days when the daily temperature is expected to rise above 80 degrees F.

D. Handle waste materials that are hazardous, dangerous or unsanitary separately from other waste by containerizing.

E. Dispose of waste material in a lawful manner.

F. Burying or burning of waste materials on the site or washing waste material down sewers will not be permitted.

G. Provide silt bags in catch basins and biobags around the basins adjacent to construction work.

H. Offsite Disposal: Disposal of all waste materials caused by the construction will be off the site and will be the responsibility of the Contractor. Provide paperwork to landfill stating that no hazardous material is present in trash being dumped.

1.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Provide a neat and uniform appearance in security and protection facilities acceptable to the Architect and the Owner.

B. Maintain site in a safe, lawful and publicly acceptable manner.

1.4 BARRICADES, WARNING SIGNS AND LIGHTS

A. Comply with recognized standards and code requirements for erection of substantial barricades where needed to prevent accidents.

B. Paint with appropriate colors and provide warning signs to inform personnel at the site and the public of the hazard being protected against.

C. Provide lighting where needed including flashing red lights where appropriate.

1.5 ENCLOSURE FENCE

A. Install an enclosure fence with lockable entrance gates to enclose the entire site or portion sufficient to accommodate the construction operation.

B. Install so as to prevent persons, dogs, and similar animals from entering the site except through the entrance gates.

C. Provide No. 11 gage galvanized open-mesh, chain-link fabric fencing 6 feet high with galvanized barbed wire top strand and galvanized steel pipe posts, 1-1/2" for line posts and 2-1/2" for corner posts.

D. Set posts in precast post blocks.

1.6 CONSTRUCTION AID BARRIERS

A. Provide ramps, ladders, stairs, guardrails, chutes and material hoists as required. Construct and maintain to requirements of governing agencies. Furnish for safety of public and construction personnel.

B. Provide barriers to protect materials, equipment, new and existing work, construction personnel and the public.

C. Provide temporary dust barriers and other appropriate protection, as required, to prevent dust from entering the existing portions of the building.

D. Completely remove temporary materials and equipment upon completion of construction.

E. Repair damage caused by installation of temporary items and restore finishes to specified condition.

END OF SECTION

SECTION 01 58 00

PROJECT IDENTIFICATION

PART 1 GENERAL

1.1 DESCRIPTION

A. The BSD Representative will direct the type of project identification signage to be placed at each project. General contractor to install BSD provided sign. No sign or advertising media of any nature shall be permitted on the site of Work or enclosing structures without the written approval of the BSD Representative. Any approved signs shall comply with the applicable laws, ordinances, and/or rules. Contractor shall not use in its external advertising, marketing programs, or other promotional efforts, any data, pictures or other representation of the District, except with prior specific written authorization from the BSD Representative.

END OF SECTION

SECTION 01 61 00

COMMON PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 MATERIAL AND EQUIPMENT SELECTION

A. Comply with Standards and these Specifications including size, make, type, and quality specified, or as accepted in writing by the Architect.

B. All products shall be new and of current manufacture unless otherwise specified.

C. All similar products shall be of the same manufacturer.

D. Manufactured and Fabricated Products:

1. Design, fabricate, and assemble in accordance with the best engineering and shop practices.
2. Manufacture like parts of duplicate units to standard sizes and gauges and to be interchangeable.
3. All similar products shall be of the same manufacturer. Two or more items of the same kind shall be considered identical and by the same manufacturer.
4. Provide products suitable for service conditions.
5. Adhere to equipment capacities, sizes, and dimensions shown or specified unless variations are specifically approved in writing.

E. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

F. Fabricate and install equipment to deliver its full rated capacity at the efficiency for which it was designed.

G. Select and install equipment to operate at full capacity without excessive noise or vibration.

H. Provide electrical products with Underwriter's Laboratories Label or as approved by the local inspection authority.

I. Any software provided with products shall be provided with appropriate licensing and use agreements for a minimum of 10 years.

1.2 MANUFACTURER'S INSTRUCTIONS

A. Perform work in accordance with manufacturer's printed installation instructions, obtain and distribute copies of such instructions to parties involved in the installation, including 3 copies to the Architect.

B. Maintain one set of complete instructions at the job site during installation and until completion.

C. Handle, install, connect, clean, condition, and adjust products in strict accordance with manufacturer's printed instructions and in conformity with specified requirements.
   1. Consult with the Architect for further instructions should job conditions or specified requirements conflict with manufacturer's instructions.
   2. Do not proceed with work without clear instructions.

D. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by the Contract Documents.

END OF SECTION

SECTION 01 62 00
PRODUCT OPTIONS

PART 1 GENERAL

1.1 PRODUCT OPTIONS

A. Specifications for public improvement contracts may not expressly or implicitly require any product by any brand name or mark, nor the product of any particular manufacturer or seller unless the product meets exemption criteria under ORS 279C.345. Consult with BSD representative if seeking an exception.

B. “Any brand” with standard of quality, performance and other characteristics clearly described, is the preferred specification and requires no specific approval by the BSD representative.

C. Single Product Named: For products specified by naming one product or manufacturer and "or accepted substitute", the Contractor must submit a request for substitution for any product or manufacturer not specifically named. Submittal is to be in accordance with this Section. “Brand X” or approved equal specification may be used, when the use is advantageous for the District, because the brand name describes the standard of quality, performance and other characteristics of the product needed by the District. Specific approval by BSD representative is required.

D. Two or More Products Named: For products specified by naming several products or manufacturers and "or accepted substitute", select any one of the products or manufacturers named, provided the product selected complies with the specifications. If another product or manufacturer not named is to be used, the Contractor must submit a request for substitution for that product or manufacturer in accordance with this Section.

E. “Or Accepted Substitute” and "Or Equal" Provisions: Where products or manufacturers are specified by name accompanied by the term “or accepted substitute” or "or equal", provide either the product named or comply with the requirements for gaining approval of "substitutions" for the use of an unnamed product. BSD approval is required. May be used when the use is advantageous to the District, because the brand name describes the standard of quality, performance, and other characteristics of the product needed by the District. “Brand X” only specifications should rarely be used and only under conditions listed in ORS 279C.345 Specifications for contracts; exemptions.
   1. It is unlikely that the exemption will encourage favoritism in the awarding of public improvement contracts or substantially diminish competition for public improvement contracts;
   2. The specification of a product by brand name or mark, or the product of a particular manufacturer or seller, would result in substantial cost savings to the contracting agency;
   3. There is only one manufacturer or seller of the product of the quality required; or
   4. Efficient utilization of existing equipment or supplies requires the acquisition of compatible equipment or supplies.

F. No materials or products containing any hazardous materials are to be used in the construction of this project. If any material or product specified in this Project Manual is known

to contain hazardous materials, it shall be brought to the attention of the Architect and Owner before ordering or fabricating that material or product.

END OF SECTION

SECTION 01 1 00
PRODUCT TRANSPORTATION, STORAGE, AND HANDLING REQUIREMENTS

PART 1 GENERAL

1.1 TRANSPORTATION

A. Arrange deliveries of products in accord with construction schedules; coordinate to avoid conflict with work and conditions at the site.
   1. Deliver products in undamaged condition and in manufacturer's original containers or packaging with identifying labels intact and legible.
   2. Immediately upon delivery, inspect shipments to assure compliance with requirements of the Contract Documents and to assure products are properly protected and undamaged.

B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.2 STORAGE AND PROTECTION

A. Store products in accordance with manufacturer's instructions with their seals and labels intact and legible.
   1. Store products subject to damage by the elements in weather tight enclosures.
   2. Maintain temperature and humidity within the ranges required by the manufacturer's instructions.
   3. Protect equipment and systems from moisture, chemical, or mechanical damage before and
      after installation.
   4. Protect shafts and bearing housings from rust.

B. Exterior Storage:
   1. Store fabricated products above the ground on blocking or skids to prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet covering. Provide adequate ventilation to avoid condensation.
   2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

C. Inspection: Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions and free from damage or deterioration.

D. Protection after Installation:
   1. Provide substantial coverings as necessary to protect installed products from damage by traffic or subsequent construction operations.
   2. Plug or cap pipe and conduit openings to prevent the entrance of foreign matter.
   3. Remove when no longer needed.

END OF SECTION

SECTION 01 71 00

EXAMINATION AND PREPARATION

PART 1 GENERAL

1.1 SUMMARY

A. Comply with requirements in individual Specification Sections for examination and preparation of work areas prior to installation of new work.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Examine areas of work prior to demolition or construction activities. Report the condition of the roof substrate and other deterioration encountered to the Architect.

B. See additional requirements in:
1. Section 02 41 19 SELECTIVE DEMOLITION.
2. Part 3 of individual Sections within these Specifications.

END OF SECTION

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 GENERAL

1.1 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

A. District sustainability goals require that this Project generate the least amount of waste possible. Every effort shall be made to minimize waste generated due to poor planning, breakage, mishandling, contamination, or other factors. Waste that is generated shall be reused, salvaged, or recycled when economically feasible. Waste disposal in landfills shall be minimized in accordance with Metro requirements.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 FINAL CLEANING

A. Contractor to provide final cleaning of Work prior to Substantial Completion Inspection.

1. Use cleaning materials that are non-hazardous.
2. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and materials being cleaned.
3. Clean debris from roofs, gutters, downspouts, and drainage systems.
4. Clean site; sweep paved areas, rake clean landscaped surfaces.
5. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner, do not burn or bury.
6. Re-clean areas or equipment; after Substantial Completion Inspection, or if dirtied as result of Contractor's work in preparing for final inspection or completion of punch list.

END OF SECTION

SECTION 01 76 00

PROTECTING INSTALLED CONSTRUCTION

PART 1 GENERAL

1.1 DESCRIPTION

A. Contractor shall adequately protect materials being stored, completed construction, and/or construction in progress so as to prevent damage from subsequent operations or vandalism. This would include but is not be limited to control of traffic to prevent damage to equipment and surfaces and providing coverings to protect finished surfaces from damage.

B. If materials or construction is damaged due to inadequate protection or vandalism, the Contractor shall clean and repair the Work and/or, at the BSD's representative's direction, replace the Work.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 CONTRACT CLOSEOUT

A. Prerequisites to Substantial Completion:
1. Obtain and submit releases enabling Owner's full and unrestricted use of the work and access to services and utilities, including (where required) occupancy permits, operating certificates, and similar releases.
2. Complete final cleaning up requirements, including touch up of marred surfaces.
3. Upon receipt of Contractor's written request for substantial completion inspection, Architect will either proceed with inspection or advise Contractor of prerequisites not fulfilled.
4. Following initial inspection, Architect will either prepare certificate of substantial completion, or advise Contractor of work which must be performed prior to issuance of certificate; and repeat inspection when requested and assured that work has been substantially completed.
5. Results of completed inspection will form initial "punch list" for final acceptance.

B. Prerequisites to Contract Closeout:
1. Letter referencing the Architect's last punch list by date, stating that all items listed have been completed and requesting a contract completion inspection.
2. Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include releases and waivers of liens from Contractors subcontractors and material suppliers, in form approved by the Owner. Include certificates of insurance for projects and completed operations where required.
3. Submit updated final statement, accounting for additional (final) changes to Contract sum.
4. Submit certified copy of Architect's final punch list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by Architect.
5. Submit consent of surety.
6. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.
7. Submit specific warranties, workmanship/ maintenance bonds, maintenance agreements, final certification and similar documents, all complete in final form.

C. Reobservation Fees: Should Architect perform more than one reobservation due to failure of the Work to comply with the claims of status of completion made by the Contractor,
1. Owner will compensate Architect for such additional services, and
2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

D. Submissions to E-builder: Submit all closeout submittals to E-builder.

END OF SECTION

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 WARRANTY, MAINTENANCE, AND OPERATIONAL MANUALS

A. General:
1. The purpose is to provide BSD with record information necessary for future operation and maintenance of the Project. Organize warranty and operating and maintenance data into suitable sets of manageable size.
2. Include the following types of information:
   a. Emergency instructions
   b. Spare parts list
   c. Summary schedule of all warranties
   d. Copies of warranties and contact information
   e. Wiring diagrams
   f. Recommended "turn around" cycles
   g. Inspection procedures
   h. Record Shop Drawings and Installed Product Data
   i. Fixture lamping schedule
   j. Ballast and driver schedule

B. Format: PDF each manual, make them searchable and selectable.

C. Manual will generally include:
1. A table of contents for each volume.
2. A list of all Subcontractors with contact information including emergency phone number at the beginning of each volume.
3. All information needed to operate and maintain systems and equipment provided in the Project presented and arranged in a logical manner for efficient use by the BSD's operating personnel.
4. A list of manufacturers with phone numbers and addresses of local distributors, services representatives, parts dealers, etc. Include 24-hour service representatives when available.
5. Equipment manufacturer, make, model number, size, and nameplate data.
6. Description of system, configuration and operation, including component identification and interrelations. A master control schematic drawings(s) will normally be required for this purpose.
7. Dimensional and performance data for specific unit provided. Extraneous catalog data must be eliminated.
8. Manufacturer's recommended cleaning methods and materials.
9. Manufacturer's recommended operating instructions as appropriate.
10. Manufacturer's recommended maintenance requirements and preventative maintenance recommendations including lubrication and other servicing data.
11. Complete parts list, including reordering information, recommended spares, and anticipated useful life (if available). Include name, telephone, and fax numbers of manufacturer's authorized service/parts distribution outlets nearest to Project.
12. Emergency instructions.
13. Warranties/guarantees.

14. Extra stock receipts.
15. Training schedule.

D. Documents to be filed in e-Builder:
1. Table of contents
2. Contact list
3. Certificate of substantial completion
4. Contractor statement of warranty
5. Lead free certification letter
6. Asbestos free certification letter
7. Certificate of occupancy
8. Final permit inspection approvals
9. Product data and warranties
   a. Product data, warranty and shop drawings to be included.
   b. Electronic Manuals: For each product, provide a pdf for the O&M and a pdf for the warranty, each named according to CSI/Specification number and title. Include a pdf of shop drawings if applicable.

E. Review Procedures:
1. Submit an electronic O&M Manual for review/acceptance; submit via E-Builder. Only submit final versions with the intent of the most expedient review process possible.

F. Provide final O&M Manual, final and complete as built files, redlined record drawings, and specifications set in PDF format. Submit via E-Builder.
1. Final and complete sets of as built drawings shall accurately and clearly reflect as-built conditions.

G. Submissions to E-Builder: Submit all closeout submittals to E-Builder.

1.2 CERTIFICATIONS

A. Asbestos Free Certification:
1. Absolutely no materials containing asbestos are to be provided or installed as part of this Project. The Contractor shall ensure that no subcontractor or any of Contractor's own forces installs any materials containing asbestos. At final closeout of the Project, the Contractor shall provide to the School District certification that no materials containing asbestos have been installed in the Project and that the Project is asbestos free as required by the State of Oregon.

B. Certificate of Occupancy.

C. Final permit inspection and approvals.

1.3 PROJECT RECORD DOCUMENTS

A. General:
1. Contractor shall not use redlined record documents for construction purposes; protect from deterioration and loss in a secure location; provide access to redlined record documents for BSD's reference during normal working hours.

B. Contractor Redlines/ Record Documents:

1. Contractor to maintain a clean, undamaged set of prints of Contract Drawings and Shop Drawings as the redline drawings and specs. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
2. Mark Record Sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
3. Mark new information that is important to the BSD, but was not shown on Contract Drawings or Shop Drawings.
4. Note related Change Order numbers where applicable.
5. Record Sets shall be digital PDF format.
6. Organize sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on the cover of each set.
7. Create copy of mechanical, electrical, and plumbing “As Built” Record Sets and submit directly to BSD Representative at Substantial Completion via E-Builder.
   a. Final and complete sets of as built drawings shall accurately and cleanly reflect as-built conditions.
8. Deliver complete Record Documents to the Architect. An electronic copy of Record Documents to be given to the Owner at the end of the Project via E-Builder.
   a. Final and complete sets of as built drawings shall accurately and cleanly reflect as-built conditions.

C. Contractor Redline/ Record Specifications:

1. Contractor to maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related Record Drawing information and Product Data.
2. Upon completion of the Work, submit Record Specifications for the BSD's records. Submit electronic copy via E-Builder at end of Project.

D. Record Product Data

1. Contractor to maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of Record Drawings and Specifications.
2. Upon completion of mark-up, submit complete set of Record Product Data to the Architect for the BSD's records. An electronic copy on a thumb drive of Record Product Data to be given to the Owner at the end of the Project.
3. Any marked up data to be provided in O&M manual. Do not submit varying versions of the same product data.

E. Miscellaneous Record Submittals:

1. Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the BSD's records.

F. Submit 1 hard copy, and one PDF set, of Permit Drawing Set with original stamp, signature and date to BSD Representative.

END OF SECTION

SECTION 02 41 20

SELECTIVE BUILDING DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Removal of designated building construction, equipment, and fixtures.
2. Identification of utilities.

B. Related Sections:
1. Division 01 - Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

A. None

1.3 REGULATORY REQUIREMENTS

A. Conform to applicable code for demolition work, safety of structure, and dust control.

B. Obtain required permits from authorities.

C. Notify affected utility companies before starting work and comply with their requirements.

D. Conform to applicable codes when hazardous or contaminated materials are discovered.

E. Do not close or obstruct exits.

F. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

1.4 PROJECT CONDITIONS

A. Minimize interference with streets, walks, public right-of-ways, and adjacent facilities.

B. If hazardous materials are discovered, notify Architect and await instructions.

C. See attached hazardous materials report for testing locations, results, and remedial actions.

D. If any of the following conditions are encountered, cease work immediately, notify Architect and await instructions:
1. Materials or conditions encountered differ from those designated in the Contract Documents.

E. Coordinate salvage and disposal with BSD.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

A. Erect temporary partitions, barricades, warning devices, and controls.

B. Provide protective coverings, shoring, bracing, and supports for construction designated to remain.

C. Temporarily or permanently disconnect utilities as required.

3.2 DEMOLITION

A. Remove existing construction to extent indicated and as necessary to join new work to existing. Do not remove more than is necessary to allow for new construction.

B. Do not damage work designated to remain.

C. Minimize noise and spread of dirt and dust.

D. Assign work to trades skilled in procedures involved.

E. Plug ends of disconnected utilities with threaded or welded caps.

F. Protect and support active utilities designated to remain. Post warning signs showing location and type of utility and type of hazard.

G. Store items designated to remain property of Owner where directed by Owner
   1. Wall partitions to be saved and delivered to Owner.

H. Remove and dispose of waste materials off site.

END OF SECTION

SECTION 03 30 00

CAST-IN PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Related Sections:
1. Section 01 4500: Quality Control, for special inspection and independent testing requirements.

1.2 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.
1. Provide schedule of specific areas to receive each type of product specified for interior slab treatment, such as sealers, and hardeners. Identify name of each product proposed for use.

B. Design Mixes: For each concrete mix. Submit at least 10 days prior to concrete delivery to site.

1.3 QUALITY ASSURANCE

A. Quality Assurance: Comply with ACI301, "Specification for Structural Concrete," and ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

B. Reinforcing Steel Standards: CRSI “Manual of Standard Practice.”

C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

D. Installer Qualifications: Use skilled workers trained and experienced in necessary crafts and familiar with requirements and methods needed for proper performance of Work of this Section.

E. Equipment for mixing and transporting concrete shall conform to ASTM C94 or ASTM C685. Ready-mixed and site mixed concrete shall be batched, mixed and delivered in accordance with ASTM C94 or ASTM C685.

1.4 SITE CONDITIONS

A. Temperature Requirements:
1. Do not place concrete when temperature will affect performance or appearance of concrete.
a. Temperature Range for Ambient Air During Concrete Placement: 40 to 80 degrees F.
b. Temperature Range for Ambient Air During Epoxy Bonding Grouts: 40 to 85 degrees F.

2. Minimum Ambient Air Temperature: 40 degrees F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS / PRODUCTS

A. Provide products by manufacturers indicated in this Section, or approved.
   1. Substitutions: Submit according to requirements of Division 01 for “Substitutions.”

2.2 CONCRETE MATERIALS

A. Concrete:

   1. Portland Cement: ASTM C 150, Type I or II.
      a. Fly Ash: ASTM C 618, Class F or Class C.
   2. Aggregate: ASTM C 33.
   3. Water: ASTM C 94, clean, free of oils, acids, organic material.
   4. Air-Entraining Admixture: ASTM C 260.
   5. Water-Reducing Admixture: ASTM C 494, Type A.
   6. Chemical Admixture: ASTM C 494, Type A water reducing or Type D water reducing and retarding.
   7. Mineral Admixture: ASTM C 618, Class F or Class C.

2.3 CONCRETE MIXES

A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, with the following properties:

   1. Minimum Compressive Strength: f'c = 2,500 psi in 28 days.
      a. Minimum Compressive Strength for Foundations: f'c = 2,500 psi in 28 days.
   2. Maximum Aggregate Size: 3/4 inch.
   3. Air Content: 4.5 to 7.0 percent.
   4. Water/Cement Ratios:
      a. 0.42 for interior slabs-on-grade.
      b. 0.50 for other concrete.

B. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information.

   1. Mix full load of concrete for 3 minutes at high speed upon arrival at site.
   2. Mix concrete for an additional 5 minutes after adding water

C. On-Site Mixed Concrete using Small-Quantity Concrete Mixers. Use standard manufacture small-quantity concrete mixers capable of combining aggregate, cement (or fly ash) and water (and admixtures, if any) into a uniform mixture. Use self-powered concrete mixers capable of mixing a volume of concrete that requires 1 sack (minimum) of cement. Clean the mixers at suitable intervals. The Engineer will periodically examine the concrete mixers for changes in condition. Acceptable concrete mixers shall consistently produce well mixed, uniform concrete.

   1. Equipment for mixing and transporting concrete shall conform to ASTM C94 or ASTM C685. Ready-mixed and site mixed concrete shall be batched, mixed and delivered in accordance with ASTM C94 or ASTM C685.

PART 3 - EXECUTION

3.1 CONCRETE PLACEMENT

A. Deposit concrete continuously and avoid segregation. Deposit concrete in forms in horizontal layers no deeper than 24 inches, avoiding cold joints.

1. Consolidate concrete with mechanical vibrating equipment.
2. Screed and initial-float concrete floors and slabs using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.2 FINISHING HORIZONTAL CONCRETE

A. Floated Slab Finish:
1. Provide floated finish for slab surfaces to receive a broom finish.
2. Comply with ACI 301, paragraph 5.3.4.2.b.
3. Begin floating when water sheen has disappeared, and surface has stiffened sufficiently to permit float finishing. Comply with ACI 301, paragraph 11.7.2; Begin floating when concrete surface has stiffened sufficiently to permit float finishing.
4. Check surface plane with a 10 foot straightedge at two or more angles during or after first floating.
5. Level to flatness of 1/4 inch in 10 feet or 1/16 inch in 3 feet.
6. Refloat immediately to a uniform sandy texture.
7. Finish to match adjoining work.

B. Horizontal Surface Finish Tolerances: Finish concrete horizontal surfaces as specified in ACI 302, paragraph 8.3.

3.3 FIELD QUALITY CONTROL

A. Test Requirements:
1. Comply with Building Code, Section 1701 for evaluation and acceptance of concrete.

B. Ready Mixed and On-Site Mixed Concrete Inspection and Testing:

1. Sample each truck load or batch of ready mixed concrete, complying with ASTM C172.
2. Perform one slump test for each truck load or batch of ready mixed concrete, complying with ASTM C 143.
3. Perform one air content test for each set of compressive strength specimens, complying with ASTM C 231.
4. Make one set of 3 of compressive strength specimens for each day of structural concrete pouring or each 50 cubic yards or fraction thereof for each class of concrete, complying with ASTM C 31.
5. Test one specimen in accordance with ASTM C 39 after curing 7 days, two specimens after curing 28 days, unless first specimen tested at 28 days does not meet specified compressive strength, in which case retain one specimen for testing after 35 days or as directed by Architect.
6. Batch Ticket:
   a. Receive a batch weight ticket from each truck; batch ticket to comply with requirements of ASTM C 94 in Article 16 for Batch Ticket Information.
   b. Verify water/cement ratio.
      1) No water may be added if load is at specified ratio.
      2) Reject truck or site mixed batch if ratio does not conform

3.4 REPAIRS AND PROTECTION

A. Surface Repairs for Exposed Concrete: Any portion of work that retains water will be repaired or replaced. Ponding of water is unacceptable.

1. Thoroughly clean, dampen with water and brush-coat area to be patched with Bonding Agent.
2. Fill honeycomb voids and rock pockets with patching compound.
3. Compact in place and screed as recommended by patching compound manufacturer.
4. Finish to match adjoining work
5. If defects in color and texture of surface cannot be repaired, remove and replace concrete.

B. Replace damaged and defective grout and anchoring cement work.

C. Protection:

1. Protect concrete from frost damage until protected by soil backfill or until cured for 28 days.
2. Protect concrete from physical damage or reduced strength caused by air temperatures below 45 degrees F. and above 75 degrees F. during curing period, complying with recommendations in ACI 306R and 305R respectively.
3. Protect concrete from shrinkage crack damage until protected by curing procedure.
4. Cover fresh grout and anchoring cement with plywood or oriented strand board for 24 hours minimum, where exposed to public, pedestrian, and animal traffic.

D. Physical Barrier Protection:

1. Barricade area containing fresh concrete slabs, stairs, ramps and walks for 24 hours minimum.
2. Cover fresh concrete with plywood where exposed to public, pedestrian, and animal traffic.

END OF SECTION

SECTION 03 01 30

CONCRETE PATCHING AND REPAIR SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes a self-drying, cement-based finish underlayment that provides a smooth surface prior to the installation of floor covering over a variety of substrates, including concrete with relative humidity up to 95%.

B. Related Sections:
1. Section 014500: Quality Control, for special inspection and independent testing requirements.
2. Section 033000, Cast-In-Place Concrete

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Safety Data Sheets.

B. Qualification Data: For Installer

1.3 QUALITY ASSURANCE

A. Product must be cement-based having an inorganic binder content which includes a minimum 80% Portland cement per ASTM C150: Standard Specification for Portland cement and other specialty hydraulic cements. Gypsum products are not acceptable.

B. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.

B. Store products in a dry area with temperature maintained between 50° and 85°F (10° and 29°C and protect from direct sunlight.

C. Handle products in accordance with manufacturer's printed recommendations.

1.5 SITE CONDITIONS

A. Do not install material below 50°F (10°C) surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section. Install quickly if substrate is warm and follow warm weather instructions per manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS / PRODUCTS

A. Self-Drying, Cement-Based Finish Underlayment
   1. Provide products by manufacturers indicated in this Section, or approved.

      a. ARDEX FEATHER FINISH® XF™; Manufactured by ARDEX Engineered Cements: 400 Ardex Park Drive, Aliquippa, PA, 15001, USA 724-203-5000, www.ardexamericas.com
      b. WATER: Water shall be clean, potable, and sufficiently cool (not warmer than 70°F).

   2. Substitutions: Submit according to requirements of Division 01 for “Substitutions.”

PART 3 - EXECUTION

3.1 CONCRETE PLACEMENT

A. General: Prepare substrate in accordance with manufacturer’s instructions.

   1. Concrete:

      a. Prior to proceeding, please refer to ASTM F710 Standard Practice for Preparing Concrete Floors to receive Resilient Flooring. All concrete subfloors must be sound, solid, clean, and free of all oil, grease, dirt, curing compounds, and any substance that might act as a bond breaker before priming. Mechanically clean if necessary, using shot blaster or other. Acid etching and the use of sweeping compounds and solvents are not acceptable.

      b. Substrates shall be inspected in accordance with ASTM F2170 and corrected for moisture or any other conditions that could affect the performance of the underlayment or the finished floor covering.

3.2 APPLICATION

A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.

B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.

C. Mixing: Comply with manufacturer's printed instructions. Do not overwater.

D. Application: Comply with manufacturer's printed instructions.

E. Curing:

   1. As soon as the product can be worked on without damaging the surface (15-20 minutes), standard floor coverings such as VCT, sheet vinyl and carpeting can be installed. If installing wood flooring, or, if high-performance adhesives will be used, such as epoxies or urethanes, the product must first cure for 16 hours (70°F).

3.3 REPAIRS AND PROTECTION

A. Surface Repairs for Exposed Concrete: Any portion of work that retains water will be repaired or replaced. Ponding of water is unacceptable.

1. Thoroughly clean, dampen with water and brush-coat area to be patched with Bonding Agent.
2. Fill honeycomb voids and rock pockets with patching compound.
3. Compact in place and screed as recommended by patching compound manufacturer.
4. Finish to match adjoining work
5. If defects in color and texture of surface cannot be repaired, remove and replace concrete.

B. Replace damaged and defective grout and anchoring cement work.

C. Protection:

1. Protect concrete from frost damage until protected by soil backfill or until cured for 28 days.
2. Protect concrete from physical damage or reduced strength caused by air temperatures below 45 degrees F. and above 75 degrees F. during curing period, complying with recommendations in ACI 306R and 305R respectively.
3. Protect concrete from shrinkage crack damage until protected by curing procedure.
4. Cover fresh grout and anchoring cement with plywood or oriented strand board for 24 hours minimum, where exposed to public, pedestrian, and animal traffic.

D. Physical Barrier Protection:

1. Barricade area containing fresh concrete slabs, stairs, ramps and walks for 24 hours minimum.
2. Cover fresh concrete with plywood where exposed to public, pedestrian, and animal traffic.

END OF SECTION

SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Non-load-bearing steel stud wall framing.
2. Steel ceiling joist framing.
NOTE: NO EQ (Equivalent Steel) STUDS.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. American Iron and Steel Institute (AISI) www.steel.org - Specification for the Design of Cold-Formed Steel Structural Members.

B. American Society of Civil Engineers (ASCE) www.asce.org7 - Minimum Design Loads for Buildings and Other Structures.

C. American Welding Society (AWS)www.aws.org D1.3/D1.3M - Structural Welding Code - Sheet Steel.

D. ASTM International (ASTM) www.astm.org:
1. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
2. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
3. A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
4. C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.
5. C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
6. C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.

E. Steel Framing Industry Association (SFIA) (www.sfia.memberclicks.net) - Member Directory.

F. Steel Stud Manufacturer's Association (SSMA) (www.ssma.com) - Member Directory.

G. Society for Protective Coatings (SSPC) (www.sspc.org) - Painting Manual.

1.3 QUALITY ASSURANCE

A. Manufacturer: Current member of SFIA or SSMA.

B. Installer Qualifications: Minimum 5 years experience in work of this Section.

C. Calculate structural properties of framing members in accordance with AISI Specifications.

D. Design wall stud system to withstand:
   1. Minimum 1/2 inch vertical deflection of structure unless noted otherwise.

E. Design system to accommodate construction tolerances, deflection of building structural members, and clearances at openings.

F. Welder Qualifications: AWS D1.3/D1.3M.

1.4 DELIVERY, STORAGE AND HANDLING

A. In accordance with ASTM C1007.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Clark Dietrich.
   2. SCAFCO Corporation.
   3. Steeler, Inc.
   4. Or accepted substitute

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Framing Materials:
   1. ASTM A653/A653M or A1003/A1003M, galvanized sheet steel, G60 coating class.
   2. Fabricate components to ASTM C955.
   3. Studs: SSMA stud profile, C-shaped, punched for utility access.
   4. Tracks:
      a. SSMA stud track profile, C-shaped, same gage, and depth as studs, unpunched.
      b. Top track: Deflection type, deep leg track with slotted screw holes; permit plus or minus 1/2 inch movement of overhead structure without damage to framing.
      c. Rim track: Provide closure for ends of joists.

2.3 ACCESSORIES

A. Bracing, Furring, Bridging and Web Stiffeners: Formed sheet steel, thickness determined by performance requirements specified.

B. Plates, Gussets, Clips: Formed sheet steel, thickness determined by performance requirements specified.

C. Fasteners: ASTM C1513; self-drilling, self-tapping screws.

D. Touch Up Paint: SSPC Paint 20, Type I or II.

2.4 FABRICATION

A. Framing components may be prefabricated using templates.

B. Cut members square and with tight fit to adjacent framing.

C. Assemble components using screw connection, welding, or clinching methods. Welding to conform to AWS D1.3/D1.3M.

D. Fabricate straight, level, and true, without warp or rack.

E. Fabrication Tolerances: In accordance with ASTM C955.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

A. Install framing components in accordance with ASTM C1007, manufacturer's instructions, and construction documents.

B. Welding: In accordance with AWS D1.3/D1.3M.

C. Make provisions for erection stresses. Provide temporary alignment and bracing.

3.2 INSTALLATION - NON-AXIALLY LOADED STUD FRAMING

A. Place top and bottom tracks in straight lines with ends butted. Fasten tracks at maximum 12 inches on center.

B. Place studs at spacing indicated and not more than 2 inches from abutting walls and at each side of openings.

C. Install deflection compensating top track at framing extending to underside of structure.

D. Connect studs to top and bottom tracks.

E. Construct corners using minimum of three studs.

F. Do not splice studs.

G. Erect, brace, and reinforce stud framing to develop strength to achieve design requirements.

H. Install headers above openings and intermediate studs above and below openings to align with wall stud spacing.

I. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

J. Laterally brace walls at locations indicated.

3.3 INSTALLATION TOLERANCES

A. In accordance with ASTM C1007.

3.4 FIELD QUALITY CONTROL

A. Testing and Inspection Services: Inspect and test shop and field welds in accordance with AWS D1.3/D1.3M.

3.5 ADJUSTING

A. Clean and touch up galvanized coatings at welded and abraded surfaces in accordance with ASTM A780, Annex A2.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Metal Grate
2. Steel Handrail
3. Metal Accessories

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section 03 30 00 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.

1.2 REFERENCES

A. American Welding Society (AWS)www.aws.org D1.3/D1.3M - Structural Welding Code - Sheet Steel.

B. ASTM International (ASTM) www.astm.org:
1. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
2. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
3. A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.

C. Society for Protective Coatings (SSPC) (www.sspc.org) - Painting Manual.

1.3 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.4 DELIVERY, STORAGE AND HANDLING

A. In accordance with ASTM C1007.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
1. Direct Metals
2. Clark Dietrich.
3. SCAFCO Corporation.

4. Steeler, Inc.
5. Or accepted substitute

B. Substitutions: Under provisions of Division 01.

2.2 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.3 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

D. Rolled-Stainless-Steel Floor Plate: ASTM A 793.

E. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

F. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

G. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
1. Size of Channels: 1-5/8 by 1-5/8 inches, unless indicated otherwise on Drawings.
2. Material for Spaces Containing Water Spray Equipment: Galvanized steel, ASTM A 653/A 653M, commercial steel, Type B or structural steel, Grade 33, with G90 coating; 0.064-inch nominal thickness, unless indicated otherwise on Drawings.
3. Material for Dry Spaces: Cold-rolled steel, ASTM A 1008/A 1008M, commercial steel, Type B or structural steel, Grade 33; 0.0528-inch minimum thickness; coated with rust-inhibitive, baked-on, acrylic enamel, unless indicated otherwise on Drawings.
4. See Section 05 43 01 "Slotted Channel Framing Supporting Suspended Ceilings" for ceiling supports.

H. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

I. Bar Grating: Basis of Design: TiteWeld 7-TW-4 Welded Steel grate panel or approved substitution.

2.4 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
1. Provide stainless-steel fasteners for fastening stainless steel.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593;

with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 1.

D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
   1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

E. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

F. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

G. Post-Installed Anchors: Torque-controlled expansion anchors.
   1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
   2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.5 MISCELLANEOUS MATERIALS

A. Anti-Corrosive Shop Primer: Either of following, compatible with finish paints specified to be used over it:
   1. Anti-Corrosive Alkyd Primer for Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   2. Rust-Inhibitive, Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.

B. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

E. Concrete: Comply with requirements in Section 03 30 00 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.6 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise

impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.7 ACCESSORIES

A. Bracing, Furring, Bridging and Web Stiffeners: Formed sheet steel, thickness determined by performance requirements specified.

B. Plates, Gussets, Clips: Formed sheet steel, thickness determined by performance requirements specified.

C. Fasteners: ASTM C1513; self-drilling, self-tapping screws.

D. Touch Up Paint: SSPC Paint 20, Type I or II.

2.8 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.9 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean items of grease,

dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, or masonry, or unless otherwise indicated.

D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
1. Items Indicated to Receive Anti-Corrosive Shop Primer: SSPC-SP 3, "Power Tool Cleaning."
2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Items Indicated to Receive Primers Specified in Section 09 96 00 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Items: SSPC-SP 3, "Power Tool Cleaning."

E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLATION TOLERANCES

A. In accordance with ASTM C1007.

3.3 FIELD QUALITY CONTROL

A. Testing and Inspection Services: Inspect and test shop and field welds in accordance with AWS D1.3/D1.3M.

3.4 ADJUSTING AND CLEANING

A. In the following paragraph, A2 - Repair Using Paints Containing Zinc Dust, is the most common method. A1 - Repair Using Zinc-Based Alloys requires heating the surface to 600 degrees F and using repair sticks that melt on contact; A3 - Repair Using Sprayed Zinc (Metallizing) requires blast cleaning of affected areas and special application equipment.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION

SECTION 06 10 00

WOOD CARPENTRY

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Provide solid blocking or backing in framing for attachment of wall mounted casework.

1.2 REFERENCES

A. American Plywood Association: PS 1, Construction and Industrial Softwood Plywood, latest edition.

B. APA PRP-108: Performance Standards and Policies for Structural Use Panels, latest edition.

1.3 SUBMITTALS

A. Shop Drawings:
1. Show layout, dimensions, profiles, joint details, and other pertinent items.
2. Show connections to adjacent work, and complete assembly.
3. Include the manufacturer's descriptive literature for specialty items.
4. Identify each item as to location, material grade, workmanship grade, wood species, finish, and location of casework

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver sheathing with edges protected from bundling strap damage and store above grade, protected from moisture.

PART 2 - PRODUCTS

2.1 MATERIALS

A. B. Screw Fasteners: Bugle head screws in accordance with ICC-ES ER-0126.

C. Lumber: Construction Grade, S-dry, Douglas Fir. Moisture content shall conform to WCLIB Rules #16, latest edition, General Grading Provisions, paragraph 3, Seasoning Provisions.

D. Fire Treatment: Osmose "Flame Proof" treated meeting flame spread 25 or less, bearing UL FR-S label. All lumber products are to be pressure impregnated with fire retardant chemicals.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Blocking:
1. Secure blocking to the building structural frame or to wall studding with appropriate fasteners to support accessory items being mounted to the blocking material.
2. Use templates furnished with accessory items to determine the location of blocking or backing materials.
3. Verify fastening devices furnished with accessory items to determine the appropriate backing material size and shape.

4. Check hardware schedule for locations where wall door bumpers are called for. Do not fasten solely to wall finish materials.

B. Wood Contacting Concrete: Wherever wood makes end or side contact against concrete, install 2 layers of No. 30 pound roofing felt so there will be no contact between wood and concrete.

3.2 ADJUSTMENTS, CLEANING, AND REPAIRING

A. Adjust moving parts to operate satisfactorily at time of project Substantial Completion and during warranty period.

B. Damage Adjustments: Repair damaged or defective work as directed. Touch up finish as required. Remove and refinish damaged areas of finish.

C. Cleaning: Clean exposed and semi-exposed surfaces.

D. Including work of other trades, clean, repair, and touch-up or replace, when directed, any products that have been soiled, discolored, or damaged by work of this Section.

E. Leave surfaces ready for finishing specified in other Sections.

F. Remove debris from project site upon work completion or sooner, if directed.

END OF SECTION

SECTION 07 23 00

INTERIOR PARTITION ACOUSTICAL INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Provide glass fiber acoustical insulation for interior partitions as indicated in drawings.

1.2 REFERENCES

A. Section 092900 Gypsum Board
B. Section 054000 Cold-formed Framing

1.3 QUALITY ASSURANCE

A. Product Data: Submit product literature, samples and installation instructions for specified insulation.

1.4 DELIVERY, STORAGE AND HANDLING

A. Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.
B. Label insulation packages to include material name, production date and/or product code.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Owens-Corning
   2. Certain Teed
   3. Johns Manville
   4. Or approved equal

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Sound Attenuation Batts:
   1. Type: Unfaced glass fiber acoustical insulation complying with ASTM C 665 Type I.
   2. Size: As required to fill partition cavities completely.
   3. Surface Burning Characteristics:
      a. Maximum flame spread: 10
      b. Maximum smoke developed: 10 When tested in accordance with ASTM E 84
   4. Combustion Characteristics: Passes ASTM E 136.
   5. Fire Resistance Ratings: Passes ASTM E 119 as part of a complete fire tested wall assembly.
   6. Dimensional Stability: Linear Shrinkage less than 0.1%

PART 3 EXECUTION

3.1 INSPECTION AND PREPARATION

A. Examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified.
B. Verify mechanical and electrical services within the shaftwall have been tested and inspected.
C. Obtain installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.
D. Clean substrates of substances harmful to insulation.

3.2 INSTALLATION - GENERAL

A. Comply with manufacturer’s instructions for particular conditions of installation in each case.
B. Batts may be friction-fit in place until the interior finish is applied.
   1. Install batts to fill entire stud cavity. If stud cavity is less than 96” in height, cut lengths to friction-fit against floor and ceiling tracks.
   2. Walls with penetrations require that insulation be carefully cut to fit around outlets, junction boxes and other irregularities.
C. Where walls are not finished on both sides or insulation does not fill the cavity depth, supplementary support must be provided to hold product in place.
D. Where insulation must extend higher than 8 feet, temporary support can be provided to hold product in place until the finish material is applied.

3.3 PROTECTION
A. Protect installed insulation as recommended by manufacturer.

END OF SECTION

SECTION 079200

JOINT SEALERS

PART 1GENERAL

1.1 SUMMARY

A. Section Includes:
1. Joint backup materials.
2. Joint sealers.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. ASTM International (ASTM):
1. C510 - Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.
2. C719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
3. C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants.
4. C834 - Standard Specification for Latex Sealing Compounds.
5. C920 - Standard Specification for Elastomeric Joint Sealants.
6. C1193 - Standard Guide for Use of Joint Sealants.
7. C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants.
8. C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
9. C1472 - Standard Guide for Calculating Movement and Other Effects When Establishing Sealant Joint Width.
10. D2203 - Standard Test Method for Staining from Sealants.
11. E 84 – Standard Test for Surface Burning Characteristics of Building Materials.
12. E 814 – Standard Test Method for Fire Tests of Penetration Firestop System.

1.3 SUBMITTALS

A. Submittals for Review:
1. Product Data: Indicate sealers, primers, backup materials, bond breakers, and accessories proposed for use.
2. Warranty: Sample warranty form.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Minimum 5 years experience in work of this Section.

B. Maximum Volatile Organic Compound (VOC) Content; interior sealers and accessories:
1. Sealers: 250 grams per liter.
2. Primers for non-porous substrates: 250 grams per liter.
3. Primers for porous substrates: 775 grams per liter.

C. Field Pre-Construction Testing:
1. Install sealers using joint preparation methods and materials recommended by sealer manufacturer.

2. When tests indicate sealant adhesion failure, modify joint preparation, primer, or both and retest until joint passes sealant adhesion test.

1.5 PROJECT CONDITIONS

A. Do not apply sealers at temperatures below 40 degrees F unless approved by sealer manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
1. BASF Building Systems. (www.buildingsystems.basf.com)
2. Dow Corning Corp. (www.dowcorning.com)
3. GE Silicones. (www.siliconeforbuilding.com)
4. Pecora Corp. (www.pecora.com)
5. Sika Corp. (www.sikausa.com)
6. Tremco, Inc. (www.tremcosealants.com)

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Joint Sealer Type 6:
1. ASTM C834, single component acrylic latex, non sag.
2. Movement capability: Plus or minus 7-1/2 percent.
3. Color: White.

B. Joint Sealer Type 7:
1. ASTM C920, Grade NS, single component silicone, non sag, mildew resistant.
2. Movement capability: Plus or minus 25 percent.
3. Color: To be selected from manufacturer's full color range.

C. Joint Sealer Type 8:
1. ASTM E 84 Flame Spread- 0 Smoke Development-0
2. ASTM E814
3. Intumescent acrylic sealant.

2.3 ACCESSORIES

A. Primers, Bondbreakers, and Solvents: As recommended by sealer manufacturer.

B. Joint Backing:
1. ASTM C1330, closed cell polyethylene foam, preformed round joint filler, non absorbing, non staining, resilient, compatible with sealer and primer, recommended by sealer manufacturer for each sealer type.
2. Size: Minimum 1.25 times joint width.

2.4 MIXES

A. Mix multiple component sealers in accordance with manufacturer's instructions.
1. Mix with mechanical mixer; prevent air entrainment and overheating.
2. Continue mixing until color is uniform.

PART 3 EXECUTION

3.1 PREPARATION

A. Remove loose and foreign matter that could impair adhesion. If surface has been subject to chemical contamination, contact sealer manufacturer for recommendation.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Protect adjacent surfaces with masking tape or protective coverings.

D. Calculate joint dimensions in accordance with ASTM C1472.

3.2 APPLICATION

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

B. Install sealers and accessories in accordance with ASTM C1193.

C. Install joint backing to maintain required sealer dimensions. Compress backing approximately 25 percent without puncturing skin. Do not twist or stretch.

D. Use bondbreaker tape where joint backing is not installed.

E. Fill joints full without air pockets, embedded materials, ridges, and sags.

F. Tool sealer to smooth profile.

G. Apply sealer within manufacturer’s recommended temperature range.

3.3 CLEANING

A. Remove masking tape and protective coverings after sealer has cured.

B. Clean adjacent surfaces.

3.4 SCHEDULE

JOINT LOCATION OR TYPE	SEALER TYPE
Interior Joints:	
Joints and penetrations in fire rated assemblies	8
Other joints	6

END OF SECTION

SECTION 081113

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Hollow steel doors and frames.

B. Related Sections:
   1. Division 01: Administrative, procedural, and temporary work requirements.
   2. Section 087100 - Door Hardware.
   3. Section 082000 – Wood Doors
   4. Section 099100 - Painting

1.2 REFERENCES

A. American National Standards Institute (ANSI)/Steel Door Institute (SDI):
   1. A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finished Painted Steel for Steel Doors and Frames.
   2. A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings.
   3. A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
   4. A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
   5. A250.11 - Recommended Erection Instructions for Steel Frames.

B. ASTM International (ASTM):
   1. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
   2. A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
   3. A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
   4. C518 - Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
   5. E413 - Classification for Rating Sound Insulation.

C. National Fire Protection Association (NFPA) 80 - Standard for Fire Doors and Fire Windows.

D. Steel Door Institute (SDI) 117 - Manufacturing Tolerances for Standard Steel Doors and Frames.

E. Underwriters Laboratories (UL):
   1. 10B - Standard for Fire Tests of Door Assemblies.
   2. 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.

1.3 SUBMITTALS

A. Submittals for Review:
   1. Shop Drawings: Show locations, elevations, dimensions, model designations, fire ratings, preparation for hardware, and anchoring details.

2. Product Data: Show elevations, dimensions, gages of metal, hardware reinforcing gages and locations, and anchor types.

B. Quality Control Submittals:
1. Certificates of Compliance: Certification that products furnished comply with ANSI/SDI A250.3, ANSI/SDI 250.4, and ANSI/SDI A250.10.

1.4 QUALITY ASSURANCE

A. Doors: ANSI/SDI A250.8.
1. Grade: II - Heavy Duty
2. Model: 1 - Full Flush.

B. Frames: ANSI/SDI A250.8, Grade II - Heavy Duty.

C. Fire Door and Frame Construction: Conform to UL 10C.

D. Installed Fire Rated Door and Frame Assemblies: Conform to NFPA 80.

E. Installed by qualified tradesmen with no less than 2 years of experience in installing similar doors.

1.5 DELIVERY, STORAGE AND HANDLING

A. Ship door frames with removable angle spreader; do not remove until frame is installed.

B. Store doors upright in protected, dry area, off ground or floor, with at least 1/4 inch space between individual units.

C. Do not cover with non vented coverings that create excessive humidity.

D. Remove wet coverings immediately.

1.6 CLOSEOUT DELIVERABLES

A. Closeout Deliverables for Doors and Frames.
1. Drawings and specifications updated to show changes that occurred during construction.
2. Shop drawings updated to show changes that occurred during construction.
3. Operation and maintenance information.

1.7 WARRANTY

A. Provide 1-year warranties on door frames.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
1. Curries. (www.curries.com)

B. Substitutions: None accepted.

2.2 DOOR TYPE:

A. Curries 747 T with 2” face frame designed for Curries 747 T doors.

2.3 MATERIALS

A. Steel Sheet:
1. ASTM A1008/1008M, cold rolled.

B. Core:
1. Interior non-fire rated doors: 8 lb. density mineral wool.

2.4 ACCESSORIES

A. Primer: Zinc rich type.

2.5 FABRICATION

A. Fabricate doors and frames in accordance with ANSI/SDI A250.8.

1. Fabricate vertical door edges as vertical seam edge filled, dressed smooth, intermittently welded seams, edge filled, dressed smooth, or continuously welded seam, dressed smooth.

B. Frames:
1. Fabricate from minimum 16 gage sheets.
2. Provide self aligning tabs and slots to hold corners in alignment.

C. Accurately form to required sizes and profiles.

D. Grind and dress exposed welds to form smooth, flush surfaces.

E. Do not use metallic filler to conceal manufacturing defects.

F. Fabricate with internal reinforcement for hardware specified in Section 087100; weld in place.

G. Design Clearances:
1. Between door and frame: Maximum 1/8 inch.
2. Undercut:
a. Non-fire rated doors: Maximum 3/4 inch.
3. Between face of door and stop: 1/16 to 3/32 inch.

H. Manufacturing Tolerances: In accordance with SDI-117.

2.6 FINISHES

A. Dress tool marks and surface imperfections to smooth surfaces.

B. Clean and chemically treat steel surfaces.

C. Touch up damaged metallic coatings.

D. Apply manufacturer's standard rust inhibiting primer paint, air-dried or baked on, meeting requirements of ANSI/SDI A250.10.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install doors and frames in accordance with ANSI/SDI A250.11.

B. Set plumb and level.
C. Secure to adjacent construction using fastener type best suited to application.

D. Install hardware in accordance with Section 087100.

3.2 ADJUSTING

A. Touch up minor scratches and abrasions in primer paint to match factory finish.

END OF SECTION

SECTION 08 20 00
WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Solid-core wood doors

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section 081113 - Hollow Metal Doors and Frames
3. Section 087100 - Door Hardware
4. Section 099100 - Painting

1.2 REFERENCES

A. Window and Door Manufacturers Association (WDMA).

1.3 SUBMITTALS

A. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
1. Dimensions and locations of mortises and holes for hardware.
2. Dimensions and locations of cutouts.
3. Undercuts.
4. Doors to be factory primed for field finishing doors.
5. Location and size of glass viewing panels (lites) for factory installation.

1.4 QUALITY ASSURANCE

A. Frames: Hollow metal frames per Section 08 11 13, Hollow Metal Doors and Frames.

B. Fire Door and Frame Construction: Conform to UL 10C.

C. Installed Fire Rated Door: Conform to NFPA 80.

D. Installed by qualified tradesmen with no less than 2 years of experience in installing similar doors.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store doors upright in protected, dry area, off ground or floor, with at least 1/4 inch space between individual units.

B. Do not cover with non-vented coverings that create excessive humidity.

C. Remove wet coverings immediately.

1.6 CLOSEOUT DELIVERABLES

A. Closeout Deliverables for Doors and Frames.
1. Drawings and specifications updated to show changes that occurred during construction.
2. Shop drawings updated to show changes that occurred during construction.

3. Operation and maintenance information.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84- inch section of a 1.75 inch thick door.
      b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
   2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
   3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Basis of design Oregon Door
   2. Lynden Door
   3. VT Industries
   4. Vancouver Door

B. Substitutions: Under provisions of Division 01.

2.2 DOOR TYPE:

A. WDMA I.S.1-A Performance Grade:
   1. Extra Heavy Duty, 1.75 inches thick. Classrooms
      a. All doors must meet specified WDMA performance duty level, including face screw holding requirement. Surface applied hardware shall be installed with screws or through-bolts.

2.3 MATERIALS

A. Interior Solid-Core Doors:
   1. Grade: Premium (Grade AA faces).
   2. Faces: Any closed-grain hardwood of mill option ready to receive field paint.
   3. Finish: Paint per Section 099100 – Painting
   4. Glazing: For all interior doors designated with lites, 1/4 inch clear float, tempered as required by current code and regulation.
   5. Vision lite frames: Shall be 18 gauge, cold-rolled steel, factory primed for paint.
   6. Exposed Vertical Edges: Same closed-grain hardwood as faces
   7. Core: Structural composite lumber core.
   8. Construction: Seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.
   9. Adhesives: Type I WDMA T.M.-6.
   10. WDMA I.S.1-A Performance Grade: Extra Heavy Duty

2.4 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with

DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

C. Openings: Factory cut and trim openings through doors.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs. Any deficiencies must be corrected prior to door installation.
2. Reject doors with defects.

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

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 Door Hardware.

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/4 inch (6.4 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.

2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3 degrees) at lock and hinge edges.

3.3 ADJUSTING

A. Operation: Correct any deficiency that prohibits doors from swinging or operating freely. Do not remove hinge screws after initial insertion. Shims used for alignment purposes must be inserted between hinge and frame. Do not insert shims between hinge and door.

B. To prevent stile failure, ensure that door closers are properly adjusted and do not limit the door opening swing. Limit door opening swing only with a properly located stop.

C. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Storefront framing for exterior storefronts.
2. Storefront framing for punched openings.
3. Glazing gaskets and sealants for storefront framing.

1.2 SUBMITTALS

A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
a. Joinery, including concealed welds.
b. Anchorage.
c. Expansion provisions.
d. Glazing.
e. Flashing and drainage.

3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

D. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch lengths of full-size components and showing details of the following:
1. Joinery, including concealed welds.
2. Anchorage.
3. Expansion provisions.
4. Glazing.
5. Flashing and drainage.

E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.

1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront.

B. Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by the manufacturer and witnessed by their qualified testing agency, or tests performed by a qualified testing agency, for the following:

1. Seismic design.
2. NFRC energy performance.

C. Sample Warranties: For special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

1.5 QUALITY ASSURANCE

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

B. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated .

C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Noise or vibration created by wind and thermal and structural movements.
c. Deterioration of metals and other materials beyond normal weathering.
d. Water penetration through fixed glazing and framing areas.
e. Failure of operating components.

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

B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

    a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design aluminum-framed entrances and storefronts.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

    a. Thermal stresses transferring to building structure.
    b. Glass breakage.
    c. Noise or vibration created by wind and thermal and structural movements.
    d. Loosening or weakening of fasteners, attachments, and other components.
    e. Failure of operating units.

C. Structural Loads:

1. Wind loads: Provide entrance system including anchorage capable of withstanding wind load design pressures. The design pressures are based on the 2019 Oregon Structural Specialty Code, Section 2404 and ASCE 7 per OSSC Section 1609.
2. Uniform Load: A static air design load of 20 psf (958 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 1330. There shall be no deflection in excess of L/175 for typical application or L/180 for Small-Missile and Large-Missile impact, of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

D. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite Insert deflection limit or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane:

a. Glass Glazing: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.
b. Non-Glass Glazing: Amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch].

E. Structural: Test according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:
a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft..

H. Seismic Performance: Aluminum-framed entrances and storefronts shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Seismic Drift Causing Glass Fallout: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.6 at design displacement and 1.5 times the design displacement.
2. Vertical Interstory Movement: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.7 at design displacement and 1.5 times the design displacement.

I. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.38 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.36 as determined according to NFRC 200.

J. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

K. Basis-of-Design Product: Subject to compliance with requirements, provide Kawneer an Arconic Co.; Trifab VersaGlaze 451T 2”x4 ½” Framing System or comparable product by one of the following:

1. Arcadia, Inc.
2. EFCO Corporation.
3. Oldcastle BuildingEnvelope.
4. Tubelite.
5. United States Aluminum.

L. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

2.2 FRAMING

A. Exterior Storefront Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Thermally broken.
2. Glazing System: Retained mechanically with gaskets on four sides.
3. Glazing Plane: Exterior.
4. Finish: Finish Type 23 - High-performance organic finish two coat.
5. Fabrication Method: Field-fabricated stick system.

B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Materials:

1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

a. Sheet and Plate: ASTM B 209.
b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
d. Structural Profiles: ASTM B 308/B 308M.

2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 GLAZING

A. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

B. Glazing Sealants: As recommended by manufacturer.

2.4 DOORS

A. Basis of Design: Kawneer AA™425 Thermal Entrance; Wide stile, 4-1/4" (108 mm) vertical face dimension, 10” bottom rail face, 2-1/4" (57 mm) depth.

B. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than 0.68.

C. Forced Entry: Tested in accordance with AAMA 1304.

2.5 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.
3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-milthickness per coat.

2.6 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

5. Provisions for field replacement of glazing from interior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.7 ALUMINUM FINISHES

A. Kawneer Permanodic™ AA-M10C21A44 / AA-M45C22A44, AAMA 611, Architectural Class I Color Anodic Coating, Color: Medium bronze.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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

3.2 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full mastic sealant bed as specified in Section 07 92 00 "Joint Sealants" to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install glazing as specified in Section 08 80 00 "Glazing."

3.3 ERECTION TOLERANCES

A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment:
   a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
   b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
   c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.4 FIELD QUALITY CONTROL

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

B. Field Quality-Control Testing: Assist in performing the following test on representative areas of aluminum-framed entrances and storefronts.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect will be tested according to AAMA 501.2 and must not evidence water penetration.
   a. Assist in performing tests in each test area as directed by Architect. Assist in performing at least three tests, prior to 10, 35, and 70 percent completion.

C. Aluminum-framed storefronts will be considered defective if they do not pass tests and inspections.

D. Owner's agency will prepare test and inspection reports.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Hardware for doors.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section 061000 - Wood Carpentry
3. Section 082000 - Solid Core Wood Doors

1.2 REFERENCES

A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):
1. A156.1 - Butts and Hinges.
2. A156.2 - Bored and Preassembled Locks and Latches.
3. A156.4 - Door Controls - Closers.
4. A156.5 - Auxiliary Locks and Associated Products.
5. A156.18 - Materials and Finishes.

B. National Fire Protection Association (NFPA):
1. 80 - Standard for Fire Doors and Windows.
2. 105 - Installation of Smoke Control Door Assemblies.

1.3 SUBMITTALS

A. Submittals for Review:
1. Shop Drawings: Schedule hardware by door type and location; show door size, hand, thickness, edge bevel, hardware components and quantities, keying, and finishes.
2. Product Data: Manufacturer's descriptive data for each component.
3. Warranty: Sample warranty form.

B. Closeout Submittals:
1. Copy of approved hardware schedule.
2. Drawings and specifications updated to show changes that occurred during construction
3. Shop drawings updated to show changes that occurred during construction.
4. Operation and maintenance information
5. Provide 3-year warranty on doors
6. Keys; tag with mark corresponding to keying schedule.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Minimum 5 years documented experience in work of this Section.

B. Provide hardware labeled by recognized independent testing laboratory and meeting requirements of NFPA 80 for fire rated doors.

C. Provide smoke gasketing at fire rated doors in accordance with NFPA 105.

D. Conform to OSSC 2019 for locating hardware and for door opening force requirements.

E. Labels:

1. Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80.
2. Provide hardware that has been tested and listed by UL for the types and sizes of doors required and complies with the requirements for the door and door frame labels.

F. ADA Compliance:
1. Interior Doors: All interior doors are required to meet ADAAG requirement that the force for pushing or pulling open interior swinging egress doors, other than fire doors, shall not exceed 5-pounds. Any interior swinging egress door not meeting this requirement will not be allowed.
2. Exterior Doors: The maximum opening force allowed is to not exceed 8-1/2-pounds.
3. Interior Fire Doors: Conform to NFPA 101 for the opening forces for interior side-hinged or pivoted-swinging door leaves without closers. These forces shall not exceed 5-pounds while the forces required to fully open any door leaf manually in a means of egress shall not exceed 15-pounds to release the latch, 30-pounds to set the leaf in motion, and 15-pounds to open the leaf to the minimum required width.

G. Pre-occupancy adjustments.
1. No less than 30 days before Substantial Completion (occupancy), Contractor, aided by door hardware Supplier, shall adjust all locks, door hinges, door swings, door wall stops, thresholds, door sweeps, door alarms, and any door powering devices for smooth and effective operation.

H. Post-occupancy adjustments.
1. At six months following Substantial Completion, Contractor, aided by door hardware Supplier, shall again adjust all locks, door hinges, door swings, door wall stops, thresholds, door sweeps, door alarms, and any door powering devices for smooth and effective operation.

1.1 DELIVERY, STORAGE AND HANDLING

A. Pack hardware items separately, with fasteners, installation instructions, and templates.

B. Mark containers with item number corresponding to hardware schedule.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers - Butt Hinges:
1. Ives by Allegion (www.allegion.com)

B. Acceptable Manufacturers – Locksets and Cylinders:
1. Schlage. (http://www.schlage.com)

C. Acceptable Manufacturers - Closers:
1. LCN by Allegion (www.allegion.com)

D. Acceptable Manufacturers - Door Seals:
1. Hager Companies. (www.hagerco.com)
2. National Guard Products, Inc. (www.ngpinc.com)
3. Pemko Manufacturing Co., Inc. (www.pemko.com)

E. Acceptable Manufacturers – Thresholds and Wall Mounted Door Stop:
1. Pemko Manufacturing Co., Inc. (www.pemko.com)

F. Acceptable Manufacturers - Kickplates:
1. Ives by Allegion (www.allegion.com)

G. Substitutions: Under provisions of Division 01.

2.2 MANUFACTURED UNITS

A. Butt Hinges:
1. Description: ANSI/BHMA A156.1, full mortis type, five knuckle, NRP.
2. Weight: Heavy weight.
3. Bearing type: Ball bearing.
4. Size: 4-1/2 x 4-1/2 inches.

B. Locksets, and Cylinders:
1. Locksets: Schlage ND92PD Vanguard Classroom Lever Lock
2. Strike plates: Curved lip, minimum lip projection necessary to protect door frame and trim and to conceal edges of strike cutout.
3. Strike boxes: Steel.
4. 6 pin with interchangeable core.
5. Keying:
   a. Schlage Classic FSIC cores 23-030-626 in the designated keyways:
      1) Elmonica Elementary School “F”
      2) Erroll Hassell Elementary School “F”
      3) Greenway Elementary School “F”
   b. Provide cores to the BSD rep for BSD keying to the specific school.

C. Closers:
1. Description: ANSI/BHMA A156.4, overhead exposed, metal cover, sized to door conditions.
2. Construction: Cast aluminum or iron body, rack and pinion operation with compression spring, fully hydraulic.
3. Closing and latching speeds: Controlled by independently adjustable concealed valves.
4. Mounting: Surface mounted, non handed with universal regular or parallel arm. Suitable for mounting on 1-3/4 inch minimum door top rail or transom bar without drop plate.
5. Adjustable opening force and delayed closing in accordance with applicable accessibility code.

D. Door Stops: As scheduled.

E. Kick Plates:
1. Type: 18-gauge, square edges, secured with flathead countersunk screws.
2. Size: 10 inches high x door width less 2 inches.

F. Thresholds:
1. Description: Provide thresholds conforming to ANSI/BHMA A156.21, extruded aluminum, clear anodized finish, BHMA 628. Provide neoprene or silicon foot seals, 1” wider than frame depth.
2. Basis-of-Design: Pemko 158
3. Installed threshold must be ADA compliant, no more than ½” in height change.

G. Rain Guards:
1. Description: Provide rain guard conforming to UL10C, dark bronze anodized aluminum. Provide neoprene seals, equal to rain guard width.
2. Basis-of-Design: Pemko 346
3. Installed rain guard length should be equal to door width, plus 4” (2” each side), per manufacturers recommendation.

1.1 FINISHES

A. Finishes: To ANSI/BHMA A156.18.

B. Door Closers: Finish No. 689, aluminum/ silver enamel.

C. Hinges at Fire-Rated Doors: Finish No. 626, satin chrome plated.

D. Thresholds and Door Seal Housings: Clear.

E. Other: Finish No. 626, satin chrome plated unless noted otherwise

F. Substitutions: Under provisions of Division 01.

PART 2 EXECUTION

2.1 INSTALLATION

A. Install hardware in accordance with approved hardware schedule and manufacturer's instructions.

B. Install locksets, closers, and trim after finish painting.

C. Set thresholds in mastic and secure.

D. Mount closers so that closers and closer arms are not visible on corridor or public side of doors.

E. Mounting Heights - Finished Floor to Center Line of:
1. Locksets: 38 inches.
2. Top hinge: Verify in field match existing spacing.
3. Bottom hinge: Verify in field match existing spacing.
4. Intermediate hinges: Verify in field match existing spacing.
5. Wall stop: to protect wall.

2.2 PROTECTION

A. Remove or protect hardware until painting is completed.

2.3 ADJUSTING

A. Test and adjust hardware for quiet, smooth operation, free from binding and rattling.

B. Adjust doors to operate with maximum opening forces in accordance with applicable accessibility code.

2.4 SCHEDULE

SET NO.	QTY	DESCRIPTION	MFR	MODEL	FINISH	NOTES
H1	3	HINGES		5HBB1HW 4.5 X 4.5 NRP	626	4.5”X4.5”
	1	WALL STOP	IVES	WS406/407CCV	630	
	2	KICKPLATE	IVES	8400 10” x 2” LDW B-CS	630	10” x 2”
	1	LOCKSET	SCHLAGE	ND92PD	626	
H2	1	SURFACE CLOSER	LCN	4111 EDA-RH TBWMS	689	NO SCUSH REQ.
	1	SURFACE CLOSER	LCN	4111 EDA-LH TBWMS	689	NO SCUSH REQ.
	6	HINGES		5B1HW 5” X 4.5” NRP	626	5”X4.5”
	2	WALL STOP	IVES	WS406/407CVX	630	
	2	KICKPLATE	IVES	8400 10” x 2” LDW B-CS	630	10” X 2”
	1	PANIC HARDWARE	VON	LD-99-27-NL RHR LBR	626	
	1	PANIC HARDWARE	VON	LD-99-27-EO LHR LBR	626	

	1	TRIM	VON	996-L-NL-R&V RHR	626	
	3	SPECIAL SCREWS		10-24 X 1-1/4" FHMS		
	2	WALL MOUNT MAG	LCN	SEM7850	689	
H3	1	LOCKSET	SCHLAGE	ND92PD	626	
H4	1	THRESHOLD	PEMKO	252x3 FGV	628	
	1	DOOR SWEEP	PEMKO	3452-V	628	
H5	3	HINGES		5HBB1HW 4.5 X 4.5 NRP	626	4.5"X4.5"
	1	WALL STOP	IVES	WS406/407CCV	630	
	1	SURFACE CLOSER	LCN	4111 EDA TBWMS	689	NO SCUSH REQ.
	2	KICKPLATE	IVES	8400 10" x 2" LDW B-CS	630	10" x 2"
	1	PANIC HARDWARE	VON	LD-99-27-NL LBR	626	
	1	TRIM	VON	996-L-NL-R&V RHR	626	
	1	THRESHOLD	PEMKO	252x3 FGV	626	
	1	DOOR SWEEP	PEMKO	3452-V	626	
	1	WEATHER STRIP	PEMKO	S88D		
	1	DRIP GUARD	PEMKO	346D	DK BR	E.A2b DOOR
H6						A101 ONLY
	3	HINGES	IVES	5HBB1HW 4.5 X 4.5 NRP	626	4.5"X4.5"
	1	WALL STOP	IVES	WS406/407CCV	630	
	2	KICKPLATE	SCHLAGE	8400 10" x 2" LDW B-CS	630	10" x 2"
	2	LOCKSET		ND92PD	626	

END OF SECTION

SECTION 08 81 10

GLASS GLAZING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Float glass.
2. Insulating glass units with solar control low-e coatings.
3. Aluminum spandrel panels.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section 08 41 13 - Aluminum-Framed Entrances and Storefronts.
3. Section 08 20 00 - Solid Core Wood Doors

1.1 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data:
1. Manufacturer's data sheets on each product to be used.
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Typical installation methods.

C. Verification Samples: Two representative units of each type, size, pattern and color; 12 inches square.
1. Insulating glass.
2. Aluminum spandrel panels.

D. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.

B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store and handle in per manufacturer's written instructions and recommendations.

B. Protect from damage due to weather, excessive temperature, and construction operations.

1.4 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental

conditions outside manufacturer's recommended limits.

1.5 WARRANTY

A. Manufacturer's standard limited warranty unless indicated otherwise.
   1. Enhance - Glass Surface Protection
      a. Interior Applications: A limited lifetime warranty.
      b. Exterior Applications: 10-year warranty.
   2. Insulating Glass Units:
      a. Manufacturer's standard form in which insulating glass manufacturer agrees to replace insulating glass units that deteriorate within specified warranty period.
      b. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions.
      c. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
      d. Warranty Period: 10 years from date of manufacture

PART 1 PRODUCTS

1.1 FLOAT GLASS

A. Basis of Design: Float Glass
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
   2. Heat-Strengthened, Tempered: ASTM C1048, Kind HS and FT.
   3. Tempered Safety Glass: ANSI Z97.1 and 16 CFR 1201.
   4. Glazing Type: Low-iron glass. Ultra-clear float glass for the highest level of visible light transmission and truest color rendering when viewing objects through the glass.
      a. Fabrication: Heat-strengthened, tempered where indicated on drawings.
      b. Product: Cut-to-size.
      c. Thickness: 1/4 inch (6 mm).

1.2 INSULATING GLASS WITH SOLAR CONTROL LOW-E COATINGS

A. Basis of Design: Energy Select 73 Plus as manufactured by AGC Glass North America and fabricated by GGI. Exterior use only.
   1. A pyrolytic passive solar low-emissivity glass.
   2. Tempered where indicated on drawings.
   3. Heat strengthened.
   4. Glazing Thickness: 1/4 inch (6 mm); standard.
   5. Overall Insulating Unit Thickness: 1 inch for new storefront system; as required for reglazing existing storefront system noted on drawings.
      a. Energy Select 36/U4: Neutral. SHGC: 0.36 maximum. Light to Solar Gain: 1.10 minimum.
         1) Outboard Glass Lite Coating Position: Surface 2.
         2) Inboard Glass Lite Coating Position: Surface 4.

1.3 ALUMINUM SPANDREL PANELS

A. Basis of Design: Insulated Aluminum Composite Panels
   1. A layered aluminum, MDF, and insulation panel.
   2. R-Value of 4 or better.
   3. Panel Thickness: 1” Nominal; standard.
   4. Color: To match existing / adjacent as noted on drawings.

PART 2 EXECUTION

2.1 EXAMINATION

A. Do not begin installation until substrates have been properly constructed and prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

2.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

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

2.3 INSTALLATION

A. Install in accordance with manufacturer's instructions approved submittals and in proper relationship with adjacent construction.

2.4 FIELD QUALITY CONTROL

A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

2.5 CLEANING AND PROTECTION

A. Clean products in accordance with the manufacturers recommendations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Acoustical insulation.
2. Gypsum board.
3. Taping and bedding of gypsum board.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section 079200 - Joint Sealers.

1.2 REFERENCES

A. American National Standards Institute (ANSI):
1. A108.11 - Interior Installation of Cementitious Backer Units.
2. A118.9 - Test Methods and Specifications for Cementitious Backer Units.

B. ASTM International (ASTM):
1. C475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
2. C514 - Standard Specification for Nails for the Application of Gypsum Wallboard.
3. C665 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Wood Frame and Light Construction Buildings.
4. C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Board.
5. C1047 - Standard Specifications for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
6. C1178 - Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel.
7. C1396 - Standard Specification for Gypsum Board.
8. C1629 - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
9. D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
10. E90 - Standard Test Method for Airborne Sound Transmission Loss of Building Partitions.
11. E413 - Standard Test Method for Classification for Rating Sound Insulation.

C. Gypsum Association (GA):
1. GA-214 - Levels of Gypsum Board Finish.
2. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
3. GA-600 - Fire Resistance Design Manual.

D. Underwriters Laboratories, Inc. (UL) - Fire Resistance Directory.

1.3 QUALITY ASSURANCE

A. Fire Resistance Ratings:

1. Construct assemblies to achieve fire resistance ratings indicated on Drawings, in accordance with referenced GA or UL design number.
2. If requirements of assembly numbers referenced conflict with Contract Document requirements, conform to assembly requirements.

1.4 PROJECT CONDITIONS

A. Maintain temperature in spaces in which work is being performed above 50 degrees F during and after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers - Gypsum Panels:
1. CertainTeed Gypsum, Inc. (www.certainteed.com)
2. GP Gypsum Corporation. (www.gp.com)
3. National Gypsum Co. (www.nationalgypsum.com)
4. USG Corporation. (www.usg.com)

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS - GYPSUM PANELS

A. Fire Resistant Gypsum Board: ASTM C1396, Type X; 48 inches wide x thickness indicated, maximum practical length, tapered edge; apply to fire rated assemblies.

2.3 ACCESSORIES

A. Fasteners: ASTM C1002, Type S screws, minimum 5/8 inch penetration into framing.

B. Adhesive:
1. Type recommended by gypsum panel manufacturer.
2. Maximum volatile organic compound VOC content: 50 grams per liter.

C. Trim Accessories: ASTM C1047.
1. Material: Formed steel, minimum 26 gage core steel, hot dip galvanized finish, expanded flanges.
2. Corner reinforcement: GA-216, Type CB-100 x 100.
3. Casing: GA-216, Type LC.
4. Control joint.

D. Joint Treatment Materials:
1. Reinforcing tape and joint compound; ASTM C475.
2. Joint compound; maximum volatile organic compound (VOC) content: 250 grams per liter.

E. Pocket Trim:
1. Product: Fry Reglet DMPT-75: Pocket Trim or approved equal.
2. Material: Aluminum Alloy (6063 T5)
3. Size: 3/4” sizing. Lengths appropriate for wall height.

PART 3 EXECUTION

3.1 INSTALLATION OF GYPSUM PANELS

A. Install panels and accessories in accordance with ASTM C754, GA-216, and manufacturer's instructions.

B. Accurately cut panels to fit around openings and projections. Do not tear face paper or break gypsum core.

C. Apply panels in most economical manner, with ends and edges occurring over supports.

D. Apply panels at fire-rated assemblies as required by design assembly.

E. Stagger joints on opposite sides of partitions.

F. Do not locate joints to align with edges of openings unless a control joint is installed.

G. Mechanically fasten panels to framing. Place fasteners minimum 3/8 inch from edges of panels; drive heads slightly below surface. Stagger fasteners at abutting edges.

H. Apply face layer of double layer applications with joints offset from those in base layer; secure with mechanical fasteners to framing or with adhesive to base layer.

I. At deflection compensating head tracks, cut panels 1/2 inch short of structure at head; do not secure panels to top runner channel.

J. Treat cut edges and holes in moisture resistant gypsum board with joint sealer.

K. Where recessed items occur in fire rated partitions, box item on all sides with gypsum board as required to maintain continuity of fire rating.

3.2 INSTALLATION OF ACCESSORIES

A. Install in accordance with manufacturer's instructions.

B. Install corner reinforcement at outside corners. Use single lengths where length of corner does not exceed standard length.

C. Install casings where indicated and where gypsum board abuts dissimilar materials or stops with edge exposed.

D. Install control joints at ceilings:
1. At maximum 50 feet on center.
2. Where ceiling framing changes direction.
3. Additional locations as indicated.

E. Install control joints at walls and partitions:
1. At changes in backup material.
2. At maximum 30 feet on center.

3.3 JOINT TREATMENT

A. Treat joints and fasteners in gypsum board in accordance with GA-214.

B. Levels of Finish:
1. Surfaces to receive tile, wall panels, or FRP Level 2 finish.
2. Surfaces to receive flat, satin or eggshell paints: Level 4 finish.
3. Surfaces to receive semigloss or gloss paints, or applied graphics: Level 5 finish.

END OF SECTION

SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.1 SUMMARY

Section includes suspended ceiling system(s) with the following:

Acoustical Panels.
1. Exposed suspension system.
2. Metal edge moldings and trim.

2.1 ACTION SUBMITTALS

Product Data: For each type of product.

A. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

Acoustical Panel: Set of 6-inch square Samples of each type, color, pattern, and texture.
1. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch long Samples of each type, finish, and color.

3.1 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES, indicating conformance with Seismic Design Category indicated on Structural Drawings for Project.

4.1 CLOSEOUT SUBMITTALS

Maintenance Data: For finishes to include in maintenance manuals.

5.1 MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Acoustical Ceiling Panels: Full-size panels equal to 2 percent of quantity installed.
1. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

6.1 DELIVERY, STORAGE, AND HANDLING

Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

A. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

B. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

7.1 FIELD CONDITIONS

Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 PRODUCTS

1.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7; see Structural Drawings for Project Seismic Design Category.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Class A: Flame spread index 0 - 25; smoke developed index 0 - 450.

2.1 ACOUSTICAL PANELS, GENERAL

A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.

B. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.

C. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

3.1 ACOUSTICAL PANELS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong World Industries, Inc.; School Zone Fine Fissured, Item No. 1714 or comparable product by one of the following:

1. CertainTeed Corp.
2. USG Interiors, Inc.; Subsidiary of USG Corporation.

B. Color: White .

C. LR: Not less than 0.90.

D. NRC: Not less than 0.60 .

E. CAC: Not less than 40.

F. Edge/Joint Detail: Reveal sized to fit flange of exposed suspension-system members .

G. Modular Size: 24 by 48 inches.

4.1 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.

a. Type: Postinstalled expansion anchors.
b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
c. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchor.
d. Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B 164 for UNS No. N04400 alloy.

2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch diameter wire.

D. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

E. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

F. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.

5.1 METAL SUSPENSION SYSTEM

A. Narrow-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation; with prefinished 9/16-inch wide metal caps on flanges.

1. Structural Classification: Heavy-duty system.
2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
3. Face Design: Flat, flush.
4. Cap Material: Steel or aluminum cold-rolled sheet.
5. Cap Finish: Painted white.

6.1 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

PART 3 EXECUTION

1.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

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

2.1 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.1 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
6. Fasten hangers to concrete filled metal decks using power-actuated fasteners or post-installed expansion anchors that extend through metal decking into concrete.
7. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
8. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

    a. Where use of exposed fasteners is unavoidable, use only pop rivets with heads factory finished to match moldings and trim.

D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
2. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

4.1 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 65 13

RESILIENT WALL BASE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Resilient Wall Base

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide resilient wall base materials manufactured in the United States of America by a firm with a minimum of 10 years' experience with resilient rubber materials of type equivalent to those specified.

B. Provide resilient wall base, flooring materials, adhesives, accessories, and subfloor preparation products from one manufacturer to ensure color matching and compatibility.

C. Manufacturer shall be capable of providing technical training and technical field service representation.

1.3 RELATED WORK

A. Installer must be professional, licensed, insured and acceptable to manufacturer of resilient flooring materials. Project Managers or Field Supervisors must be INSTALL (International Standards & Training Alliance)certified CFI (Certified Floorcovering Installers) Certified and/or an FCICA (The Flooring Contractors Association) CIM (Certified Installation Manager) for the requirements of the project or equivalent.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within the range recommended by Flexco of 55 degrees F (13 degrees C) and 85 degrees F (29 degrees C).

1.5 PROJECT CONDITIONS

A. Install resilient products after other finishing operations, including painting, have been completed.

B. Maintain ambient temperatures within range of (± 10 degrees F) 65 degrees (18 degrees C) and 85 degrees F (29 degrees C) in the spaces to receive the resilient products during:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

C. Maintain relative humidity between 40% and 65% during installation.

D. Avoid conditions in which dew point causes condensation on the installation surface.

1.6 WARRANTY

A. Provide manufacturer's standard limited commercial warranty to cover manufacturing defects

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Basis-of-Design: Flexco Floors | 1401 East 6th Street | Tuscumbia, AL 35674 | P: (800) 633-3151

B. Substitutions: Under provisions of Division 01.

2.2 PRODUCTS

A. TRADITIONAL WALL BASE
   1. Meets the performance requirements for the following Industry Standards:
      a. ASTM F1861, Standard Specification for Resilient Wall Base, Type TP (rubber, thermoplastic), Group 2 (layered), Style A&B(straight, cove)
      b. ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials, Class A.
      c. ASTM E648 (NFPA 253), Standard Test Method for Critical Radiant Flux, Class 1, >0.45 W/cm².
      d. ASTM E662 (NFPA 258), Standard Test Method for Smoke Density, Passes, <450
      e. ASTM F137, Standard Test Method for Flexibility of Resilient Flooring Materials protocols, Passes
      f. ASTM F386, Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces, Passes
      g. ASTM F925, Standard Test Method for Resistance to Chemicals of Resilient Flooring, Excellent
      h. ASTM F1515, Standard Test Method for Measuring Light Stability of Resilient Flooring protocols, Passes National Fire Protection Association (NFPA):
      i. NFPA 253, Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source
      j. NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials
      k. NFPA 258, Test Method for Specific Density of Smoke Generated by Solid Materials

B. RUBBER WALL BASE
   1. Flexco Base 2000, or approved substitution.
   2. 4” height (match existing)
   3. Coved
   4. Color: Match existing.

2.3 INSTALLATION AND MAINTENANCE MATERIALS
A. Substrate/Background Preparation Products:
   1. Adhesives: Adhesives should be selected based on the site conditions and use of the space being installed.
B. Recommended Adhesive Products:
   1. Excelsior WB-600 Acrylic Wall Base Adhesive by Flexco
   2. Excelsior C-630 Contact Adhesive by Flexco

PART 3 EXECUTION

3.1 EXAMINATION
A. Verification of Conditions: Inspect all substrates/backgrounds to ensure they are clean, smooth, permanently dry, structurally sound and without voids. Confirm all areas are properly sealed and acclimated per manufacturer’s requirements.
B. Verification of Products: In accordance with manufacturer’s installation requirements, visually inspect material for size, style, color or visual defects prior to installing. Any material that is incorrect or visually defective shall not be installed.

3.2 SUBSTRATE/BACKGROUND PREPARATION
A. General: Follow guidelines laid out in Division 01, Section 017100 – Examination and preparation. All work required ensuring substrate/background meets manufacturers’ guidelines are the responsibility of the general contractor.

B. Preparation: Ensure substrate/background meets the requirements of ASTM F1861 for resilient wall base and/or manufacturer's Technical Data Sheets.
   1. Substrates/backgrounds must be free of visible water or moisture, dust, sealers, paint, residual adhesives and adhesive removers, solvents, wax, oil, grease, mold, mildew and any other extraneous coating, film, material or foreign matter.
   2. Acclimate all products to be used during the installation and the installation environment prior to installation according to the manufacturers written instructions.
   3. Fill cracks, holes, depressions and irregularities in the substrate/background to prevent transferring through to the surface of the resilient wall base.

3.3 INSTALLATION
A. General: Follow all relevant guidelines detailed in Division 01, as well as wall base and adhesive manufacturer's technical data sheets.
B. Resilient Vinyl Wall Base: Install material in accordance with manufacturer's recommendations.
   1. Select the appropriate adhesive for the application and job site conditions.
   2. Install material according to roll sequence or with like run numbers.
   3. Ensure material is rolled appropriately into the adhesive using a hand roller.

3.4 CLEANING & MAINTENANCE
A. General: Clean up installation area and vacuum dust or wipe material to remove any dirt, dust, or debris.
B. Initial Maintenance: Conduct initial maintenance per the manufacturer's recommended procedures stated in the Maintenance Documents.
C. Regular Maintenance: Conduct maintenance on regular intervals as needed. Insufficient cleaning will reduce the wear life of the wall base and alter the aesthetic properties of the wall base. The amount of maintenance depends directly upon the amount of dirt and particulates the area is subjected to.

END OF SECTION

SECTION 09 65 19

RESILIENT TILE FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Flooring and accessories as shown on the drawings and as indicated by the requirements of this section.
B. Related Sections:
   1. Division 3 Concrete; not the work of this section
   2. Section 01 30 00 - Submittals.

1.2 REFERENCES

A. ASTM International:

   1. ASTM E 648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
   2. ASTM E 662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
   3. ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
   4. ASTM F 1066 Standard Specification for Vinyl Composition Tile
   5. ASTM F 1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
   6. ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
B. National Fire Protection Association (NFPA):
   1. NFPA 253 Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
   2. NFPA 258 Standard Test Method for Measuring the Smoke Generated by Solid Materials

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Provide flooring which has been manufactured, fabricated and installed to performance criteria certified by manufacturer without defects, damage, or failure.
B. Administrative Requirements
   1. Pre-installation Meeting: Conduct an on-site pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.
   2. Pre-installation Testing: Conduct pre-installation testing as follows: moisture test, bond test, and pH test.
C. Sequencing and Scheduling

1. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring.
2. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond, moisture tests and pH test.

1.4 SUBMITTALS

A. Submit manufacturer's technical data, installation, and maintenance instructions for flooring and accessories.

B. Submit the manufacturer's standard sample line allowing the Owner to select colors for flooring and applicable accessories.

C. Submit Safety Data Sheets (SDS) available for adhesives, moisture mitigation systems, primers, patching/leveling compounds, floor finishes (polishes) and cleaning agents and Material Information Sheets for flooring products.

D. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.

2. Warranty: Warranty documents specified herein.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility: provide types of flooring and accessories supplied by one manufacturer, including moisture mitigation systems, primers, leveling and patching compounds, and adhesives.

B. Select an installer who is experienced and competent in the installation of resilient vinyl composition tile flooring and the use of subfloor preparation products.

C. Fire Performance Characteristics: Provide resilient vinyl composition tile flooring with the following fire performance characteristics as determined by testing material in accordance with ASTM test methods indicated below by a certified testing laboratory or other testing agency acceptable to authorities having jurisdiction:

1. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I

2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.

B. Store materials in a clean, dry, enclosed space off the ground, protected from harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing. Store flooring, adhesives and

accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

1.07 PROJECT CONDITIONS

A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65ºF and a maximum temperature of 85ºF for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55ºF in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

1.08 WARRANTY

A. Resilient Flooring: Submit a written warranty executed by the manufacturer, agreeing to repair or replace resilient flooring that fails within the warranty period.

B. Limited Warranty Period: 5 years

C. Limited Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

D. For the Limited Warranty to be valid, this product is required to be installed using the Manufacturer's specific installation instructions.

1.10 MAINTENANCE

A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials from same production run as products installed. Packaged with protective covering for storage and identified with appropriate labels.

1. Furnish quantity of flooring units minimum of 10 square feet.
2. Comply with Owner's requirements for delivery, storage and protection of extra material.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Resilient tile flooring, adhesives, and subfloor preparation products and accessories:

1. Armstrong Flooring Inc. (Basis of Design)
2. Johnsonite (Tarkett)
3. Congoleum Corporation

2.2 RESILIENT TILE FLOORING MATERIALS

A. Provide Vinyl Composition Tile: Armstrong Standard Excelon Imperial Texture or approved equal. Pattern and texture to match existing as approved by Owner.

1. Description: Tile composed of polyvinyl chloride resin, plasticizers, fillers, stabilizers and pigments with colors and texture dispersed uniformly throughout its entire thickness.
2. Vinyl composition tile shall conform to the requirements of ASTM F 1066, “Standard Specification Vinyl Composition Floor Tile", Class 2, through-pattern
3. Pattern and Color: Color to be an approximate match to existing as selected by the Owner from Manufacturer’s standard line of colors.
4. Size: 12 in. x 12 in.
5. Thickness: 1/8"/0.125 in. (3.2mm) – Verify and match existing tile thickness.

2.3 PRODUCT SUBSTITUTION

A. Substitutions per Division 01.

2.4 ADHESIVES

A. For Tile Installation System, Full Spread: Provide Armstrong S-515 “Tile Strong” Floor Tile Adhesive under the tile suitable for high moisture. Zero VOC.

2.5 ACCESSORIES

A. For patching, smoothing, and leveling monolithic subfloors (concrete), provide Armstrong S-456 High Performance Patching and Smoothing compound. Zero VOC.

B. For priming porous substrates to aid in adhesive bond strength and reducing subfloor porosity, provide S-454 Prime Strong™ acrylic primer for porous substrates. For non-porous substrates, provide S-455 Prime Strong™ acrylic primer for non-porous substrates.

C. Floor Transitions:

1. Description: A transition between VCT and carpet is required in all instances.
2. Basis-of-Design: PEMCO 173A

PART 3 EXECUTION

3.1 MANUFACTURER’S INSTRUCTIONS

A. Comply with manufacturer’s product data, including technical bulletins, product catalog, installation instructions, and product carton instructions for installation and maintenance procedures as needed.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions (i.e. moisture tests, bond test, pH test, etc.).

B. Visually inspect flooring materials, adhesives and accessories prior to installation. Flooring material with visual defects shall not be installed and shall not be considered as a legitimate claim.

C. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

D. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.

E. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

F. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.3 PREPARATION

A. Subfloor Preparation: Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with cement based self-leveling compound as recommended by the flooring manufacturer. Refer to ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional information on subfloor preparation.

B. Subfloor Cleaning: The surface shall be free of dust, solvents, varnish, paint, wax, oil, grease, sealers, release agents, curing compounds, residual adhesive, adhesive removers and other foreign materials that might affect the adhesion of resilient flooring to the concrete or cause a discoloration of the flooring from below. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents. Spray paints, permanent markers and other indelible ink markers must not be used to write on the back of the flooring material or used to mark the concrete slab as they could bleed through, telegraphing up to the surface and permanently staining the flooring material. If these contaminants are present on the substrate they must be mechanically removed prior to the installation of the flooring material. Refer to ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional information on subfloor preparation.

C. For Tile High-Moisture Installation Warranty when using S-515 Adhesive, perform subfloor moisture testing in accordance with ASTM F 1869,“Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride” and Bond Tests as described in the Armstrong Flooring Guaranteed Installation Systems manual, F-5061, to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. Relative humidity shall not exceed 95%.MVER shall not exceed 7 lbs./1000 sq. ft./24 hrs. On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained.

D. Concrete pH Testing: Perform pH tests on concrete floors regardless of their age or grade level. All test results shall be documented and retained.

3.4 INSTALLATION OF FLOORING

A. Install flooring in strict accordance with the Manufacturer's written instructions.

B. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.

C. Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.

D. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

3.5 INSTALLATION OF ACCESSORIES

A. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

3.6 CLEANING

A. Perform initial cleaning maintenance per the Manufacturer's written instructions.

3.7 PROTECTION

A. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.

END OF SECTION

SECTION 09 68 00

CARPET FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes OFCI Broadloom Carpet.
B. Broadloom Carpet
C. Carpet Tile.
D. Carpet cushion.

1.2 RELATED SECTIONS

A. None.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
B. Installer Qualifications: Minimum 2 year experience installing similar products.

1.5 DELIVERY, STORAGE AND HANDLING

A. Owner to supply stock of OFCI Broadloom carpet.

B. Store materials in a clean, dry, enclosed space off the ground, protected from harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

1.6 PROJECT CONDITIONS

A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65ºF and a maximum temperature of 85ºF for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55ºF in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

1.7 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.8 MAINTENANCE

A. Extra Materials: Return extra materials to Owner. Packaged with protective covering for storage and identified with appropriate labels.

1. Furnish quantity of flooring units minimum of 4 square feet.
2. Comply with Owner's requirements for delivery, storage and protection of extra material.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Adhesives, and subfloor preparation products and accessories:

1. Armstrong Flooring Inc. (Basis of Design)
2. Johnsonite (Tarkett)
3. Congoleum Corporation

2.2 CARPET FLOORING MATERIALS

A. OFCI. BSD to provide carpet stock for patching &/or carpet to be salvaged from onsite demo as shown in plan.

B. Carpet Broadloom
Products: Basis-of-Design products from Mohawk, Lees Commercial or comparable by one of the following:

1. Interface
2. Mannington Mills, Inc.

Product:

1. Color: As indicated in Color and Materials Schedule in drawings or if not indicated, as selected by Architect from full range of ready to ship industry colors, we anticipate a color to be selected from the grey and /or blue color lines.

2. Pattern: As indicated in Color and Materials Schedule in drawings or if not indicated, as selected by Architect from full range of ready to ship industry colors.

3. Fiber Content: Duracolor by LEES Stain Resistant System, Performance Loop Pile, Solution Dyed

4. Product Construction: Tufted Broadloom

5. Pile Thickness: 0.203 inches

6. Surface Pile Weight: 22 oz./sq. yd.

7. Pile Density: 6,739 oz/sq. yd.

8. Primary Backing/Back-Coating: Manufacturer's standard composite materials.

9. Backing System: Intergra HP

10. Size: 12’ width

Performance Characteristics:

1. Appearance Retention Rating: Severe traffic, 3.5 minimum according to ASTM D 7330.

2. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.

3. Dry Breaking Strength: Not less than 100 lbf (445 N) according to ASTM D 2646.

4. Dimensional Tolerance: Within 1/32 inch (0.8 mm) of specified size dimensions, as determined by physical measurement.

5. Dimensional Stability: Less than 10% according to AATCC – 134.

6. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.

7. Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) according to AATCC 16, Option E.

8. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

C. Carpet Tile (Walk-Off Mat)
Products: Basis-of-Design products from Mohawk, First Step II or comparable by one of the following:

3. Interface
4. Mannington Mills, Inc.

Product:

1. Color: As indicated in Color and Materials Schedule in drawings or if not indicated, as selected by Architect from full range of industry colors.

2. Pattern: As indicated in Color and Materials Schedule in drawings or if not indicated, as selected by Architect from full range of industry colors.

3. Fiber Content: Duracolor by LEES Stain Resistant System, Performance Loop Pile, Solution Dyed

4. Product Construction: Tufted

5. Pile Thickness: 0.203 inches

6. Surface Pile Weight: 38 oz./sq. yd.

7. Pile Density: 6,739 oz/sq. yd.

8. Primary Backing/Back-Coating: Manufacturer's standard composite materials.

9. Backing System: EcoFlex ICT

10. Size: 24” x 24”

Performance Characteristics:

1. Appearance Retention Rating: Severe traffic, 3.5 minimum according to ASTM D 7330.

2. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.

3. Dry Breaking Strength: Not less than 100 lbf (445 N) according to ASTM D 2646.

4. Dimensional Tolerance: Within 1/32 inch (0.8 mm) of specified size dimensions, as determined by physical measurement.

5. Dimensional Stability: Less than 10% according to AATCC – 134.

6. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.

7. Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) according to AATCC 16, Option E.

8. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

2.3 PRODUCT SUBSTITUTION

A. None.

2.4 ADHESIVES

A. Full Spread: Provide Armstrong S-288 Flooring Adhesive under the carpet suitable for high moisture. Zero VOC.

2.5 ACCESSORIES

A. For patching, smoothing, and leveling monolithic subfloors (concrete), provide Armstrong S-456 High Performance Patching and Smoothing compound. Zero VOC.

B. For priming porous substrates to aid in adhesive bond strength and reducing subfloor porosity, provide S-454 Prime Strong™ acrylic primer for porous substrates. For non-porous substrates, provide S-455 Prime Strong™ acrylic primer for non-porous substrates.

C. No floor transition is required between walk-off material and existing carpet.

PART 3 EXECUTION

3.1 EXAMINATION

B. Do not begin installation until substrates have been properly prepared.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

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

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction. Test for proper operation and adjust until satisfactory results are obtained.

B. Comply with recommendations of Carpet and Rug Institute 'Specifier's Handbook'.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.5 WARRANTY

A. Manufacturers standard warranty for any new product/ material, as well as a Contractor 1-year labor warranty.

B. OFCI / Salvage carpet to carry Contractors 1-year labor warranty and the Manufacturers standard warranty for the adhesive product applied.

END OF SECTION

SECTION 09 72 00

WALL COVERINGS

PART 1 GENERAL

1.1 SUMMARY

A. Contractor shall furnish, install and finish a vinyl wallcovering as specified in the contract documents.
B. Related Sections:
   1. Division 01: Administrative, procedural, and temporary work requirements.
   2. Section 092900 – Gypsum Board.

1.2 QUALITY ASSURANCE

A. Delivery, Storage and Handling

   1. All necessary materials for installation including wallcovering, primer, and adhesives must be delivered to the job site undamaged. All containers are to be clearly marked with the manufacturer's identification label. Store vinyl wallcovering rolls and materials in a clean, dry area where temperature and humidity remain constant and within the manufacturer's specifications.

1.3 PROJECT CONDITIONS

A. Maintain temperature in spaces in which work is being performed above 65 degrees F during and for at least 48 hours after installation.
B. Walls shall be finished to the Architect's specification and be free of surface defects and dirt. The Contractor for the installation process must provide sufficient lighting and access.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers – Vinyl Wall Covering:
   1. Koroseal. (www.koroseal.com)
   2. Wolf Gordon (www.wolfgordon.com/)

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS – VINYL WALL COVERING

A. Contractor to match approximate style, gauge and finish of existing vinyl wallcovering material.
B. All vinyl wallcoverings installed shall meet the latest GSA Federal Specification *CCC-W-408-D. In addition, wallcoverings must meet or exceed Wallcovering Association Quality Standard *W-101-2013 for Vinyl Coated Fabric Wallcovering.
C. All Type I (15 oz) and Type II (20 oz) wallcoverings specified shall pass the ASTM-G21 testing for mold and mildew resistance. *The ASTM-E84 test must be passed with the wallcovering mounted to common gypsum wallboard.

PART 3 EXECUTION

3.1 INSPECTION

A. The Contractor shall provide a complete copy of the manufacturers hanging instructions to the installer pertaining to the installation of the wallcovering. ALL INSTALLATIONS MUST CONFORM

TO THE MANUFACTURERS CURRENT INSTALLATION INSTRUCTIONS AND PRODUCT TECHNICAL INFORMATION.

B. All Labels shall be checked for accuracy by the installer to insure that the shipment is received as ordered.

C. If no defect is evident before installation, the material should be inspected after the product is installed. If any defect is evident at this time (or at any point of the installation) no further material should be applied and the Contractor should be contacted IMMEDIATELY.

3.2 SURFACE PREPARATION

A. All hanging surfaces must be clean, smooth, dry, undamaged, free of mold, mildew, grease, or stains and structurally intact. All loose paint and other wallcoverings must be removed. If moisture is present, immediately identify and eliminate the source(s) of the moisture and verify that all wall surfaces are completely dry before proceeding.

B. Any mold or mildew must be removed from walls and hanging surfaces prior to installation. Walls should not contain in excess of 4% residual moisture content. Moisture infiltration and accumulation can lead to mold or mildew growth and must be corrected prior to the installation of the wallcovering.

C. Proper surface preparation is key to getting results. To prepare the surface properly, it is recommended that a universal, white-pigmented mold inhibiting wallcovering primer is applied to wall surfaces prior to installation.

D. Use only a lead pencil for marking walls and back of wallcovering. Do not use ballpoint or marking pen, they will bleed through the surface.

E. Do not install wallcovering unless a temperature above 65 degrees F is maintained in both areas of installation and storage for at least 48 hours prior to installation.

3.3 INSTALLATION

A. If the application is a textured or non-matched wallcovering pattern, reverse hanging of alternate panels is required to ensure color continuity from strip to strip. If the application is a mural it is recommended that every other panel is rotated 180 degrees when printing to minimize the side-to-side color shift that may occur with each printer.

B. Determine whether the pattern match is random, straight across, or drop match. Measure the wall height, allowing for pattern match, add 4 inches, and then cut the wallcovering. It will overlap onto the ceiling and the base approximately 2 inches. Apply the recommended adhesive to the back using either a pasting machine or a paint roller. Work the adhesive in, to cover the back completely, especially near the edges. Fold each end toward the middle, pasted sides together, aligning the edges carefully so they do not dry out. CAUTION: Do not crease wallcovering. Allow to “relax” for ten minutes (booking). This will allow the adhesive to penetrate the wallcovering fabric, which is important to a successful installation.

C. WITH ALL DIRECTIONAL PATTERNS, IT IS IMPORTANT TO LINE UP PATTERNS AT EYE LEVEL ALLOWING ANY DRIFT IN LINEUP TO RUN OFF TOWARD CEILING AND FLOOR. THE STANDARD ALLOWANCE IS ONE QUARTER OF AN INCH UP OR DOWN. IF PATTERN IS LINED UP AT THE CEILING THE PATTERN WILL BEGIN MISALIGNMENT SOONER AND THE GAP WILL BE LARGER. ALSO, MOST PATTERNS WILL BE VIEWED AT EYE LEVEL THEREFORE IT IS THAT AREA THAT NEEDS TO LOOK ALIGNED. IF THERE ARE ANY QUESTIONS ABOUT PATTERN LINEUP, CONTACT SUPPLIER. BE SURE FIRST DROP OF WALLCOVERING IS SQUARE ON WALL BY PLUMBING THE WALL AND USING A LEVEL.

D. Avoid burnishing the face of the material. Use a wallcovering brush or a plastic scraper to smooth the wallcovering onto the wall. For optimal durability we recommend the use of a liquid topcoat to protect the surface of the wallcovering pattern from stain and abrasion.

E. Do not rub. Do not allow vinyl adhesive to dry on surface as it may leave a white residue. Wash off excess paste from face of wallcovering as you hang it with a cellulose sponge. The cellulose sponge must be rinsed in clean water after every use. Blot dry with a clean cloth.

F. Place the second strip to the edge of the first strip. Tape seams before overlapping and double cutting to avoid getting adhesive on the wallcovering. If paste does get on the vinyl, clean it off

immediately with clean warm water and blot dry with a clean lint less towel. Use a soft bristle brush to wash the ceiling and the baseboard to remove any paste residue. Do not leave any overlap on the seams since vinyl will not adhere to itself. *Seams should be vertical, have a tight fit, and be free from air and paste bubbles. Seams should not be located closer than 6” to corners.

G. Examine the installed panels for color uniformity. Any objectionable variations in colormatch, pattern match, etc should be immediately communicated to the printer for inspection before proceeding further with installation.

H. After installation, the walls and wallcovering should be monitored for potential moisture or vapor infiltration or accumulation. Any such infiltration/accumulation after installation must be promptly eliminated in order to reduce the risk of mold/mildew growth.

3.4 CLEAN UP AND COMPLETION

A. Upon completion of work, remove all surplus material and debris from work site. All work sites must be clean and orderly upon installation crew departure.

END OF SECTION

SECTION 098200

SOUND ABSORPTION MATERIAL

PART 1GENERAL

1.1 SUMMARY

A. Section Includes:
Sound, Draft, Heat, Cold and Dust Blocking; Fire-resistant Acoustic Partition closure and Joint Filler for Interior, Non-moving Joints and Gaps

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
2. Division 09: Interior Walls and Partitions
3. Division 08: Store Fronts and Curtainwalls

1.2 SUBMITTALS

A. Submittals for Review:
1. Product Data: Indicate sealers, primers, backup materials, bond breakers, and accessories proposed for use.
2. Warranty: Sample warranty form.

1.3 QUALITY ASSURANCE

A. The following paragraph specifies a minimum level of experience required of the parties performing the work of this section. Retain if required and edit to suit project requirements.

B. Manufacturer's Checklist must be completed by expansion joint subcontractor and returned to manufacturer at time of ordering material.

C. Warranty – Manufacturer's standard warranty shall apply.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver products to site in Manufacturer's original, intact, labeled containers. Handle and protect as necessary to prevent damage or deterioration during shipment, handling and storage. Store in accordance with manufacturer's installation instructions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The Basis-Of-Design material is QuietJoint SHH (for opaque substrates) and QuietJoint SHG (when against transparent substrates as manufactured by: (USA & International) EMSEAL JOINT SYSTEMS, LTD 25 Bridle Lane, Westborough, MA 01581-2603, Toll Free: 800-526-8365. (Canada) EMSEAL, LLC 120 Carrier Drive, Toronto, Ontario, Canada M9W 5R1 Toll Free: 800-526-8365. www.emseal.com

B. Alternate manufacturers must demonstrate that their products meet or exceed the performance criteria of the basis of design products and must submit certified performance test reports performed by recognized independent laboratories as called for in section 1.02 Submittals.

2.2 GENERAL

A. Provide a non-invasively-anchored, high-STC/OITC, sound attenuating, fire-resistant, and thermally insulating mass-loaded partition closure for sealing construction-created voids and gaps.

B. Typical locations include, but are not limited to the following: acoustic partition barriers, end of partition to window (SHG 3-sided coating), end of partition to mullion (SHH 2-sided coating), end of partition to wall (SHH), and head of wall (SHH).

C. Provide open-cell foam infused with a mass-loading, fire-retardant impregnation.

D. Silicone external color facing to be factory-applied to the foam. Silicone coating to be available in a range of not less than 26 standard colors for coordination with typical building materials.

E. Select the sealant system model appropriate to the design requirements at each gap location that meets the project specification or as defined by the designer of record.

PART 3 EXECUTION

3.1 PREPARATION

A. The contractor shall clean the joint opening of all contaminants immediately prior to installation of joint closure.

3.2 APPLICATION

A. Consult manufacturer’s installation instructions supplied with materials before proceeding.

B. Being careful not to stretch it, lay out the material and cut it to the desired length.

C. Position material over the joint opening and squeeze by hand to ease it into the joint. Position the material so as to ensure a uniform, flat, plane.

D. The silicone coating will fold at its edges to absorb slight variations in substrates while maintaining a smooth appearance.

E. Once in desired location, use a plastic putty knife to tuck the edges of the silicone against the substrates to remove any wrinkles.

F. The internal backpressure of the material will mate it to the mullion, partition, glass or other joint faces. The material is to remain free of any metal components, i.e. fasteners, screws, bolts, extrusions, etc.

3.3 CLEANING

A. Protect the system and its components during construction. Subsequent damage to the joint closure will be repaired at the general contractor’s expense. After work is complete, clean exposed surfaces with a suitable cleaner that will not harm or attack the finishes.

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Surface preparation and field application of paints.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. ASTM International (ASTM):
1. D4442 - Standard Test Method for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
2. D6886 - Standard Test Method for Speciation of the Volatile Organic Compounds (VOCs) in Low VOC Content Waterborne Air-Dry Coatings by Gas Chromatograpy.

B. Green Seal, Inc. (GS) 11 - Standard for Paints and Coatings.

C. Master Painters Institute (MPI)- Architectural Painting Specification Manual.

D. Society for Protective Coatings (SSPC) - Painting Manual.

1.3 SUBMITTALS

A. Submittals for Review:
1. Product Data: Manufacturer's data on materials proposed for use including:
a. Product designation and grade.
b. Product analysis and performance characteristics.
c. Standards compliance.
d. Material content.
e. Mixing and application procedures.
f. MSDS Information Sheet.

2. Samples:
a. 5 x 8inch samples of each coating system on representative substrate. Step back successive coats so that all coats remain exposed. Indicate type of material used for each coat.

3. Paint Schedule: Indicate types and locations of each surface, paint materials, and number of coats to be applied.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Minimum 5 years documented experience in work of this Section.

B. Materials, Preparation, and Workmanship: Conform to MPI Painting Manual.

1.5 DELIVERY, STORAGE AND HANDLING

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

B. Paint Materials: Store at ambient temperature from 45 to 90 degrees F in ventilated area, or as required by manufacturer's instructions.

C. Comply with requirements of authorities having jurisdiction, in regard to the use, handling, storage and disposal of hazardous materials.

D. All surplus latex paint shall be recycled using a local latex paint recycling program. Surplus paint includes all latex paint in excess of quantities stored for touch-up purposes. Latex paint stored for touch-up purposes may not exceed 5% or 5 gallons, whichever is smaller, by volume, to the nearest gallon.

1.6 PROJECT CONDITIONS

A. Do not apply materials when surface and ambient temperatures or relative humidity are outside ranges required by paint manufacturer.

B. Maintain ambient and substrate temperatures above manufacturer’s minimum requirements for 24 hours before, during. and after paint application.

C. Do not apply materials when relative humidity is above 85 percent or when dew point is less than 5 degrees F different than ambient or surface temperature.

D. Provide lighting level of 30 foot candles at substrate surface.

1.7 MAINTENANCE

A. Extra Materials: Minimum of 1/2 gallon of each color and sheen, clearly labeled, provided to owner at project closeout.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design: Rodda Paint Unique II | 10120 SW Park Way, Portland, OR 97225| P: (503) 292-1515
   1. Rodda Paint Co. – Cedar Hills (www.Roddapaint.com)

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Paints:
   1. Color to be selected by Owner per manufacturers standard line.
   2. As scheduled at end of Section, or approved substitute.
   3. Free from all forms of lead and mercury.

B. Maximum Volatile Organic Compound (VOC) Content for interior paints, coatings, and accessories: In accordance with GS-11 and SCAQMD 1113.

2.3 ACCESSORIES

A. Accessory Materials: Paint thinners and other materials required to achieve specified finishes; commercial quality.

B. Patching Materials: Latex filler.

C. Fastener Head Cover Materials: Latex filler.

2.4 MIXES

A. Deliver paints pre-mixed and pre-tinted.

B. Uniformly mix to thoroughly disperse pigments.

C. Do not thin in excess of manufacturer's recommendations.

D. Re-mix paint during application; ensure complete dispersion of settled pigment and uniformity of color and gloss.

PART 3 EXECUTION

3.1 EXAMINATION

A. Test shop applied primer for compatibility with subsequent coatings.

B. Measure moisture content of surfaces using electronic moisture meter. Do not apply coatings unless moisture content of surfaces are below following maximums:
   1. Gypsum board and plaster: 12 percent.
   2. Wood: 15 percent, measured to ASTM D4442.

3.2 PREPARATION

A. General:
   1. Protect adjacent and underlying surfaces and work from other trades.
   2. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
   3. Correct defects and clean surfaces capable of affecting work of this section.
   4. Seal marks that may bleed through surface finishes with waterborne stain blocker.
   5. Patch and repair all surfaces to be painted.

B. Impervious Surfaces: Remove mildew by scrubbing with solution of trisodium phosphate and bleach. Rinse with clean water and allow to dry.

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

D. Galvanized Steel: SSPC Method SP1 - Solvent Cleaning.

E. Aluminum: SSPC Method SP1 - Solvent Cleaning.

F. Uncoated Ferrous Metals: SSPC Method SP2 - Hand Tool Cleaning or Method SP3 - Power Tool Cleaning.

G. Shop Primed Ferrous Metals:
   1. SSPC Method SP2 - Hand Tool Cleaning or Method SP3 - Power Tool Cleaning.
   2. Feather edges to make patches inconspicuous.
   3. Prime bare steel surfaces.

H. Existing Surfaces:
   1. Remove loose, flaking, powdery, and peeling paints.
   2. Lightly sand glossy painted surfaces.
   3. Fill holes, cracks, depressions and other imperfections with patching compound; sand flush with surface.
   4. Remove oil, grease, and wax by scraping; solvent wash and thoroughly rinse.
   5. Remove rust by wire brushing to expose base metal.

I. Single Source Responsibility: If used, provide primers and undercoat paint produced by the same manufacturer as the finish coat.

3.3 APPLICATION

A. Apply paints in accordance with manufacturer's instructions and MPI Painting Manual, Premium Grade finish requirements.

B. Apply primer or first coat closely following surface preparation to prevent recontamination.

C. Do not apply finishes to surfaces that are not dry.

D. Apply coatings to minimum dry film thickness recommended by manufacturer.

E. Apply each coat of paint slightly darker than preceding coat unless specified otherwise.

F. Apply coatings to uniform appearance without laps, sags, curtains, holidays, and brush marks.

G. Allow applied coats to dry before next coat is applied.

H. When required on deep and bright colors apply an additional finish coat to ensure color consistency.

I. Continue paint finishes behind wall-mounted accessories.

J. Sand between coats on interior wood and metal surfaces.

K. Match final coat to approved color samples.

L. Prime concealed surfaces of interior wood in contact with masonry or cementitious materials with one coat primer paint.

M. Mechanical and Electrical Components:
   1. Paint factory primed equipment.
   2. Remove unfinished and primed louvers, grilles, covers, and access panels; paint separately.
   3. Paint exposed and insulated pipes, conduit, boxes, ducts, hangers, brackets, collars, and supports unless factory finished.
   4. Do not paint name tags or identifying markings.
   5. Paint exposed conduit and electrical equipment in finished areas.

6. Paint duct work behind louvers, grilles, and diffusers flat black to minimum of 18 inches or beyond sight line.

N. Do not Paint:
1. Surfaces indicated on Drawings or specified to be unpainted or unfinished.
2. Surfaces with factory applied finish coat or integral finish.
3. Architectural metals, including brass, bronze, stainless steel, and chrome plating.

O. At the end of each work day, remove empty cans, rags, rubbish, and other discarded materials from the site. Provide “Wet Paint” signs to protect newly painted surfaces. After completing painting, clean all surfaces from paint splatter.

3.4 ADJUSTING

A. Touch up or refinish disfigured surfaces.

3.5 CLEANING

A. Remove paint from adjacent surfaces.

3.6 PAINT SCHEDULE

Elmonica Elementary School

A. P-1: (To Match Existing)
1. Manufacturer: Rodda
2. Color: #CH-2132 Linen
3. Sheen: Satin
4. Installation: 2 finish coats over 1 coat of primer

B. P-2: (To Match Existing)
1. Manufacturer: Rodda
2. Color: Color Match Existing Red
3. Sheen: Semi-gloss
4. Installation: 2 finish coats over 1 coat of primer

C. P-3: (To Match Existing)
1. Manufacturer: Rodda
2. Color: Color Match Existing Red
3. Sheen: Semi-gloss
4. Installation: 2 finish coats over 1 coat of primer

Errol Hassell Elementary School

A. P-1: (To Match Existing)
1. Manufacturer: Rodda
2. Color: #CH-2132 Linen
3. Sheen: Satin
4. Installation: 2 finish coats over 1 coat of primer

B. P-2: (To Match Existing)
1. Manufacturer: Rodda
2. Color: Color Match Existing Brown
3. Sheen: Semi-gloss

4. Installation: 2 finish coats over 1 coat of primer

C. P-3: (To Match Existing)
   1. Manufacturer: Rodda
   2. Color: #CH-2451 Blue
   3. Sheen: Semi-gloss
   4. Installation: 2 finish coats over 1 coat of primer

Greenway Elementary School

A. P-1: (To Match Existing)
   1. Manufacturer: Rodda
   2. Color: #CH-2132 Linen
   3. Sheen: Satin
   4. Installation: 2 finish coats over 1 coat of primer

B. P-2: (To Match Existing)
   1. Manufacturer: Rodda
   2. Color: Color Match Existing Brown
   3. Sheen: Semi-gloss
   4. Installation: 2 finish coats over 1 coat of primer

C. P-3: (To Match Existing)
   1. Manufacturer: Rodda
   2. Color: #601 Linden
   3. Sheen: Semi-gloss
   4. Installation: 2 finish coats over 1 coat of primer

1. Re-paint:	Paint applied over existing painted finish in good condition.
2. Primer:	One coat of type recommended by coating manufacturer for maximum coating adhesion.
3. Finish:	Sheen and material as appropriate for space. Doors and other areas requirement semi-gloss finish shall be 100% acrylic
4. Drywall:	Select finish according to use of space. Minimum acceptable finish is one coat of heavy bodied Acrylic wall board sealer as primer and two coast Interior Latex sheen per Finish Schedule.
9. Gypsum Wallboard, Interior:	Primer: PVA Finish: Acrylic latex, Rodda Paint Lasyn, or equal
14. Non-ferrous Metal:	Primer: Vinyl wash primer Finish: Industrial enamel, two coats

END OF SECTION

SECTION 102613

CORNER GUARDS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide wall corner guards as indicated on the Drawings and as specified herein.

1.2 SUBMITTALS

A. Submit manufacturer's data and installation instructions for the Architect's review.

B. Submit layout drawing indicating location of corner guards for approval prior to ordering. Copies of the Architectural Drawings will not be accepted.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Corner Guards: Corner guards shall be stainless steel or aluminum. Plastic is unacceptable. Sharp edges must be avoided.
   1. Size and Shape: L-shaped. Field verify required dimensions. Proved to height of 5 feet.

B. Include all required internal, external, and interrupted end caps with attachment plates and concealed fasteners.

PART 3 EXECUTION

3.1 INSTALLATION

A. Verify that surfaces to which corner guards are applied have been reinforced or provided with wood backing or blocking required for solid anchorage. Install with counter sunk screws. Fastening with adhesives, toggle bolts, molly screws, or similar fasteners is not permitted.

B. Furnish miscellaneous specialty items at proper time for inclusion in the construction and install in accordance with manufacturer's instructions and recommendations.

C. Do not remove any protective finish coatings or cover until final clean-up.

END OF SECTION

SECTION 22 00 00

BASIC PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 OTHER REQUIREMENTS

A. The Bidding, General and Supplementary of this project manual and specific sections as noted apply to the work specified in Plumbing Division 22 which encompasses Sections 22 00 00 through 22 42 00. This Section 22 00 00 applies to all sections of Division 22 Plumbing.

1.2 SCOPE

A. It is the intent of these specifications and the accompanying drawings to describe complete plumbing systems installations for all building areas, new and renovation.

B. Furnish and install all material, labor and equipment in accordance with these documents.

C. Include all incidental items and work not specifically shown or specified but required by good practice in a complete system.

D. The drawings and specifications are complementary. What is called for in one shall be called for in both.

E. The drawings are diagrammatic but should be followed as closely as possible. Where required by jobsite conditions, relocate and provide fittings, etc., as required. Provide an allowance in the contract bid to furnish additional pipe and fittings required for coordination with structure and other construction trades.

1.3 DEFINITIONS

A. Or approved equal: Requires approval prior to bid date.

B. Indicated:
1. The term "indicated" is a cross reference to details, notes, or schedules on the drawings, other paragraphs or schedules in the specifications, and similar means of recording requirements in the Contract Documents.
2. Where terms such as "shown," "noted," "scheduled," and "specified" are used instead of "indicated," it is for the purpose of helping the reader locate the cross reference, and no limitation of location is intended except as specifically noted.

C. Directed, Requested, Etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by the Engineer," "requested by the Engineer," etc. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

D. Site or Project Site: The space available to the Contractor for the performance of the work, either exclusively or in conjunction with others performing the work as part of the project. The extent of the project site is shown on the plumbing drawings and is not identical with the description of the land upon which the project is to be built.

E. Approved:
1. Where used in conjunction with the Architect's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the meaning of the term "approved" will be held to the limitations of the Architect's responsibilities and duties as specified in the General and Supplementary Conditions.
2. In no case will "approval" by the Architect be interpreted as a release of the Contractor from responsibilities to fulfill requirements of the Contract Documents.

F. Provide: The term "provide" means to furnish and install, complete and ready for the intended use.

1.4 STANDARDS AND CODES

A. Provide all equipment and material and perform all work in accordance with all local, state and national codes and regulations.

B. For work on this project, comply with appropriate standards published by the following:

1.	American Gas Association	AGA
2.	American National Standards Institute	ANSI
3.	Acoustical Society of America	ASA
4.	American Society of Mechanical Engineers	ASME
5.	American Society for Testing and Materials	ASTM
6.	National Fire Protection Association	NFPA
7.	Underwriters' Laboratories	UL
8.	International Building Code (w/State of Oregon Amendments)	UBC
9.	International Mechanical Code (w/State of Oregon Amendments - Oregon Mechanical Specialty Code)	UMC
10.	Uniform Plumbing Code (w/State of Oregon Amendments - Plumbing Specialty Code)	UPC

1.5 APPROVAL OF EQUIPMENT AND MATERIALS

A. Manufacturer's trade names, catalog numbers and material specifications used in this specification are intended to establish the quality of equipment or materials expected. Materials and manufacturers not listed require approval prior to the bid date.

B. Approval of substitute equipment or materials will be based upon performance, quality and other factors deemed important by the Architect. The Contractor will be responsible for making all changes in this and other associated work required as a result of the substitution. Additional or modified structural calculations and roof penetrations required to accommodate the substitution will be the responsibility of the contractor.

1.6 SUBMITTALS

A. Transmit submittals for review as noted in the architectural specifications.

B. Furnish performance data and technical information on all materials and equipment to be used on the project.

C. Review of submittals or shop drawings by the Architect does not relieve the Contractor from the requirements of the Contract Documents unless specific approval has been requested for a given deviation.

1.7 QUALITY ASSURANCE

A. Maintain the highest standards of workmanship throughout the project.

B. Use the latest editions of applicable and specifically referenced standards.

C. Inspect all material and equipment upon arrival at the site and return any which is not in new condition.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 COORDINATION

A. Cooperate with other trades to assure that construction proceeds in an orderly and timely manner. Contract cost increases due to improperly sequenced work with other trades will not be allowed.

B. Study the new and existing architectural, structural, electrical, shop and any specialty drawings as appropriate and specifications to determine required coordination.

C. Prepare detailed shop drawings where necessary to assure proper fit and necessary clearance.

D. Refer to electrical drawings to verify voltage and phase of plumbing equipment.

3.2 PERMITS, FEES AND INSPECTIONS

A. Obtain all required permits and pay for all fees and connection charges.

B. Schedule any required inspections.

3.3 MATERIALS AND WORKMANSHIP

A. Furnish all materials and equipment in new condition, free from defects and of size, make, type and quality specified. Installation shall be in a neat and workmanlike manner.

B. When two or more items of the same kind, type or class are required, use items of a single manufacturer.

3.4 MEASUREMENTS

A. Take all measurements from reference datums established by the plumbing contractor.

3.5 DELIVERY, HANDLING AND STORAGE

A. Receive all material and equipment at the jobsite or shop.

B. Use proper and sufficient equipment to handle all products employed in the project.

C. Where storage of material or equipment is necessary, it shall be a clean and weatherproof area. Seal any openings and cover the product to assure that there will be no corrosion or foreign matter introduced. Assure that it will be in new condition when placed in service.

3.6 EQUIPMENT INSTALLATION, BRACING AND SUPPORT

A. Install all equipment in strict accordance with the manufacturer's instructions unless otherwise indicated.

B. The drawings in general are based upon one of the specific manufacturers listed for a particular equipment item. The other specified manufacturers and additional approved manufacturers of equipment may require deviations from the drawings to properly install the particular equipment in accordance with the manufacturer's recommendations and to provide the system results required. Provide all work necessary in the base bid price to install this equipment.

C. Where the installation shown or specified is contrary to the manufacturer's instructions, advise the Architect in writing of the differences before proceeding with the installation.

D. Anchorage to Floors, Roofs, Etc., Sway Bracing and Seismic Restraints:
1. Provide supports for all apparatus as specified, detailed, as required by the manufacturers of specific equipment and the project governing code authorities. Anchor all roof and base/floor mounted equipment with size and spacing of anchor bolts or other attachment means as recommended by the respective equipment manufacturer.
2. Provide supports for all apparatus as specified, detailed, as required by the manufacturers of specific equipment and the project governing code authorities. Anchor all roof and base/floor mounted equipment with size and spacing of anchor bolts or other attachment means as recommended by the respective equipment manufacturer. Provide seismic restraints on all mechanical equipment in conformance with the 2014 Oregon Structural Specialty Code Section 1613 Earthquake Loads. Costs for seismic calculations are to be included in the bid price.
3. Provide deferred submittals directly to the governing code jurisdiction for anchorage to floors, roofs, etc., sway bracing and seismic restraints. Submittals to show locations and sufficient support details as required by the governing code jurisdiction.
4. Maintain a copy of the manufacturer's installation instructions at the jobsite for all equipment.

3.7 SLEEVES AND INSERTS

A. Provide sleeves at all locations where piping and ductwork passes through building construction.

B. Sleeves for interior walls and floors shall be 22-gauge galvanized or heavier as required. Sleeves for exterior walls shall be cast iron, wall thickness as required.
1. Wall sleeves shall be installed in all exterior walls and all interior masonry or fire-rated walls in a manner that preserves the fire-rated or watertight integrity of the wall.
2. Interior wall sleeves for uninsulated pipe shall allow minimum 1/4-inch clearance all around pipe for pipe movement. Allow 1-inch clearance around pipe at building expansion joints.

3. Interior wall sleeves for insulated piping shall be selected to encompass the pipe and insulation and allow minimum 1/4-inch clearance around insulation for pipe movement. Allow 1-inch clearance around pipe and insulation at building expansion joints.
4. Floor sleeves shall extend 4-inches above the floor and shall be sealed watertight. Floor sleeves shall be oversized to allow 1/2-inch minimum space all around pipe or pipe and insulation where applicable. Seal space between pipe and sleeve with Dow Corning Fire Stop System, 3M brand CP25 or approved equal. Sealant must be between pipe and sleeve. Sealant between insulation and sleeve is not acceptable. Install firestop materials in complete accordance with the manufacturer's instructions and in compliance to applicable UL listings..

C. Seal space between pipe and sleeve with Dow Corning Fire Stop System, 3M Brand CP25 or approved equal where piping penetrates firewall or floors. Sealant must be between pipe and sleeve; sealant between insulation and sleeve is not acceptable. Install firestop materials in complete accordance with the manufacturer's instructions and in compliance to applicable UL listings.

D. Utilize Linkseals or similar closures on core-drilled penetrations through below grade walls. Repair existing below grade waterproofing systems as applicable.

3.8 FLOOR, WALL AND CEILING PLATES

A. Provide escutcheon plates where all exposed piping passes through finished walls, floors and ceilings, including accessible cabinet spaces.

B. Floor plates: deep recessed, cast brass, chrome plated.

C. Wall and ceiling plates: spun aluminum, chrome plated.

D. Secure plates to pipe or structure. Plates shall not penetrate insulation vapor barriers. Size plates to sufficiently cover pipe sleeves and openings in finish materials.

3.9 ACCESS DOORS AND PANELS

A. Manufacturers: Cesco, Milcor, Elmdor. Cesco used as basis of selection.

B. Non-rated panels: Style W, SR-1, SR-2, P, PX as required for wall or ceiling construction, 12 inch x 16 inch or larger as required for ease of access.

C. Fire-rated panels: Style FB, U.L. listed for 1-1/2 hr for fire rated stud and masonry wall systems.

D. Provide access panels where shown on the drawings or as required for proper access to mechanical appurtenances. Coordinate the installation of access panels is with the specific building construction penetrated. Coordinate access panel installation with Manufacturer's instructions.

E. Below 8 feet, accessible to students, key building access panel standard. Above 8 feet accessible to students to be flat screw driver latch.

F. Locate and size access doors to facilitate equipment service and optimize the safety of the maintenance personnel. Minimum access door size to be 18"x 18".

3.10 PROTECTION

A. Protect all work, material and equipment from loss or damage until the Owner accepts the project.

B. As the work progresses, keep all equipment covered and cap all piping that may temporarily be left unconnected.

C. Notify all other trades of any required precautions necessary to protect the work.

3.11 ACCESSIBILITY

A. Provide convenient access by location or access panel to all equipment requiring periodic service.

3.12 ELECTRICAL WORK

A. Materials and work to be provided as a part of this Plumbing Division 22 are:
1. Equipment control wiring.
2. Interlock wiring.
3. Motor starters.

B. Wherever possible, provide all interconnect wiring within or on a piece of equipment with the equipment unless shown or specified otherwise. An electrician licensed to perform this type of work shall perform all field wiring.

3.13 RELATED WORK

A. The following work and materials are specified elsewhere:
1. Pipe chases, equipment pads and foundations, trenches, painting, air louvers, louvered penthouse and access panels except as otherwise specified in this division.
2. Framed openings, wood grounds and nailing strips, masonry, concrete and other architectural and structural elements.

B. The following work and materials are specified in Electrical Division:
1. Power wiring.
2. Disconnect switches.
3. Furnishing and installation of disconnect switches.
4. Installation of magnetic starters.

3.14 CLEANING

A. Maintain premises and public properties free from accumulations of waste, debris and rubbish during construction.

B. Clean all plumbing equipment of dust, grease, iron cuttings, unnecessary stamps or shipping labels, etc.

C. Touch up factory-painted surfaces, as necessary, with paint of matching color.

3.15 RECORD DRAWINGS

A. Maintain one set of construction drawings at the jobsite for the sole purpose of recording work of the plumbing contract, as actually installed. Upon request, the Architect will make the original tracings available to the plumbing contractor for printing the drawings.

B. Contractor to provide to owner floor plan showing locations and size of all shutoff valves and backflow preventors.

C. Record all piping by dimensions from gridlines, below grade, above floor, etc. Show location of all access panels, cleanouts, rough-in for future, etc.

D. Make record drawings available to the Architect for review or reproduction during construction. The Architect will pay any printing costs.

E. Deliver record drawings to the Architect promptly upon completion of the project.

3.16 OPERATION AND MAINTENANCE MANUALS:

A. Transmit submittals for review as noted in the architectural specifications. Operation and Maintenance Manuals shall include the following:

B. Directories:
1. Supplier Directory: Alphabetical list of principal subcontractors and suppliers of equipment giving names, addresses and telephone numbers.
2. Equipment Directory: List of plumbing equipment installed such as, pumps, water heaters, plumbing fixtures, etc., giving drawing reference numbers, location, area served, manufacturer with model number and supplier.

C. Manufacturer's Literature:
1. Show name, address and phone number of the nearest service facility authorized by the manufacturer.
2. Include illustrations, diagrams, and instructions for installation, startup, operation, inspections, maintenance, parts list, data sheets and other necessary materials.
3. Include complete electrical, schematic and connection diagrams for each equipment item.
4. Include the name, address and phone number of contractor(s) who furnished and who installed equipment and systems.
5. Where the literature covers more than one model, check off neatly in ink correct model number and data for the model number including all specified options.
6. In those instances where the equipment, its mode of control, or both, is job assembled for special functions, then provide written operating and maintenance instructions prepared by the assembler on 8-1/2" x 11" sheets.

D. Maintenance Instructions:
1. Where instructions for maintenance are not included in the manufacturer's literature, provide supplemental data to enable proper maintenance of the equipment installed.
2. Include specific lubrication methods and recommended frequencies along with procedures and precautions for inspection and routine service.

E. Copy of Written Guarantee.

F. Recommended Spare Parts Stock.

END OF SECTION

SECTION 22 05 23

GENERAL DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

2.1 SUMMARY

A. Work included: Providing of all required valves, cocks and faucets.

2.2 SUBMITTALS

A. Provide submittals in accordance with Section 22-00-00.

B. Submittals shall include manufacturer's catalog or technical data showing performance, dimensions, materials of construction and recommended methods of installation.

2.3 OPERATION AND MAINTENANCE DATA

A. Provide O&M data in accordance with Section 22-00-00.

B. O&M data will include manufacturer's literature and Maintenance instructions.

PART 2 - PRODUCTS

3.1 MANUFACTURERS

A. Gate Valves, Ball Valves and Drain Valves: Hammond, Stockham, Nibco, Milwaukee or approved equal. Hammond used as basis of selection.

3.2 DESCRIPTION

A. All valves used in potable water applications are to be third party certified by a state recognized certifying agency to comply with 2014 Federal Lead free act.

B. Gate Valve (Domestic Water Service): Figure UP 647, Class 125, 200 PSI non-shock cold water rated solder type bronze body gate valve with solid wedge disc, integral seat, threaded bonnet, non-rising stem, iron hand wheel.

C. Ball Valves (Domestic Water Service): Ball valves for domestic water service shall be lead free Figure UPBA300/300S 150 SWP / 600 WOG, 400 PSI non-shock cold water rated 3-piece bronze body ball valve with full port, blow out proof stem, RTFE seats and PTFE packing, free floating chrome plated brass ball.

D. Drain Valves: Hose end valve, 150 WWP, adjustable packing nut and stuffing box, Buna-N seats, iron handwheel. Provide cap & chain.

E. Horizontal Swing Check Valves: Figure UP943, 125 lb. screwed, swing check valve with renewable Teflon composition disc.

F. Vertical/Spring and Silent Check Valves: Acceptable Manufacturers: Metra-Flex or TRW Mission Duo Check II, ASA 150 Class, semi-steel or cast iron body, bronze trim.

PART 3 - EXECUTION

4.1 INSTALLATION

A. 2” and smaller valves to be ball valves. 2-1/2” and greater to be flanged, ductile iron or bronze body gate valves.

B. Provide valves at connections to equipment, where shown on the drawings or as required.

C. Install all valves with stem horizontal or above, accessible and same size as connected piping.

D. Provide separate support for valves where necessary.

E. Install check valves in horizontal position only.

F. Butterfly valves are not permitted.

G. Plumbing contractor is to provide schedule of Backflow Devices in an excel spreadsheet. The information shall also be included in the O&M manual and correlated with the drawings. The information in the documents shall include the following..

1. Type
2. Manufacturer
3. Size
4. Model
5. Serial Number
6. Location at the site.

END OF SECTION

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Work included: Providing of all required hangers and supports for piping, and equipment.

1.2 SUBMITTALS

A. Provide submittals in accordance with Section 22-00-00.

B. Submittals shall include:
1. Manufacturer's technical literature for all products used indicating service for each type of hanger.
2. Include proposed pre-manufactured piping and duct vibration isolation products.
3. Submit literature or describe duct-supporting method.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. M-CO, Grinnell, Super Strut. M-CO used for selection.

B. Vibration Isolators:
1. Type of isolator, base, and minimum static deflection shall be as required for each specific equipment application as recommended by isolator or equipment manufacturer but subject to minimum requirements indicated herein.
2. Uniform Loading: Select and locate isolators to produce uniform loading and deflection even when equipment weight is not evenly distributed.
3. Mason Industries products used as basis of selection.

2.2 DESCRIPTION

A. Pipe Attachments:
1. Non-insulated ferrous pipe (1/2 to 1-1/2 inch): Figure 100.
2. Non-insulated ferrous pipe (2 inch and larger): Figure 400.
3. Non-insulated copper pipe: Figure 101.
4. Insulated pipe: Figures 1031 and 4031.
5. Riser clamp, ferrous pipe: Figure 510.
6. Riser clamp, plastic DWV: Figure 515.

B. Upper Attachments: Attachment to wood structures where weights permit shall be Figure 325 or 328.

C. Structural Attachments: Provide all necessary structural attachments such as concrete anchors, beam clamps, hanger flanges and brackets. Hangers shall not be suspended from other piping, equipment, etc.

D. Miscellaneous items such as hanger rod, rod couplings, turnbuckles, etc. shall be standard figure numbers of the same manufacturer as the attachments.

E. All-threaded rods for pipe supports shall be no less than 3/8" diameter.

F. All floor mounted equipment to be placed on a 4-inch high concrete housekeeping pad.

G. Rooftop pipe supports:
   1. B-line DBR series or equal.
   2. Rubber block supports: DBP Series 6"Wx4"Tx4.8L
      a. Accessories fastened directly into rubber material with weather resistant type 12 lag screws.
      b. 14 ga galv. Channel.
      c. Roller supports.
   3. Electro-plated steel brackets, axle & hardware.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide hangers and supports in accordance with the instructions furnished by the manufacturers of these devices.

B. For horizontal pipe lines install pipe hangers with maximum hanger spacing and maximum hanger rods as recommended in Table 6 of the 2000 edition of the ASHRAE Guide and Data Book, Systems and Equipment Chapter 41: Where concentrated loads of valves, fittings, etc. occur, closer spacing will be necessary and shall be based on the weight to be supported and the maximum recommended loads for the hanger components. Cast iron soil pipe shall be supported at every joint.

C. Horizontal banks of piping for plumbing piping only, i.e. domestic hot and cold water, may be supported on a common steel channel strut member spaced not more than the shortest allowable span required on the individual pipe. Piping to be maintained at these relative lateral positions using clamps, slips or free to roll axially or slide using a Figure 125 insulated protector at all points of support for insulated lines.

D. Provide additional structural members where required to support piping.

E. Provide hangers and support devices in accordance with the equipment manufacturer's instructions for all equipment.

F. Anchorage to Floors, Roofs, Etc., Sway Bracing and Seismic Restraints:
   1. The contractor is responsible to determine the means and methods of equipment installation and support.
   2. Provide supports for all apparatus as specified, detailed, as required by the manufacturers of specific equipment and the project governing code authorities. Anchor all roof and base/floor mounted equipment with size and spacing of anchor bolts or other attachment means as recommended by the respective equipment manufacturer
   3. Always consult roofing manufacturer for roof membrane compression capacities.
   4. Gas pipe spacing subject to local gas authorities.
   5. Use properly sized pipe clamps to suit pipe size(s).

6. Provide seismic restraints on all mechanical equipment in conformance with the 2014 Oregon Structural Specialty Code Section 1613 "Earthquake Loads". Costs for seismic calculations are to be included in the bid price.
7. Provide deferred submittals directly to the governing code jurisdiction for anchorage to floors, roofs, etc., sway bracing and seismic restraints. Submittals to show locations and sufficient support details as required by the governing code jurisdiction.
8. Provide supplementary drawings and calculations as required by governing code jurisdictions noting seismic support data/calculations as required for permit purposes.

G. Copper piping will be isolated from hangers and supports for cold water services and services which required a vapor barrier. Hot water service may be in contact with copper plated or plastic-coated hangers.

END OF SECTION

SECTION 22 05 53

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Work included: Providing of all required identification systems for equipment and piping.

1.2 SUBMITTALS

A. Provide submittals in accordance with Section 22 01 00.

B. Submittals shall include:
1. List of proposed equipment and valve tags.
2. Product information on piping markers.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. W. H. Brady Co. or Seton.

2.2 DESCRIPTION

A. Equipment Identification: Equipment identification tags shall be three-ply, white center, black face plastic plates with l/2" high letters for major and l/4" high letters for minor equipment.

B. Piping Markers:
1. All vinyl self-sticking labels.
2. Markers shall comply with the district standard for width, size of letters, background colors, etc. in compliance with ANSI A13.1 Markers to comply with the following color convention:

Service	Color
Steam	Aluminum
Hot Water Heating	Tan
Cooling Water	White
Chilled Water	Green
Domestic Cold Water	Blue
Domestic Hot Water	Gold
Natural gas	Yellow
Compressed Air	Black
Fire Service Water	Red
Waste and Vent	Brown

3. Labels shall indicate “supply”, return” or “recirculation” as applicable to the piping system.

C. Valve Tags: Tags shall be not less than one inch in diameter, 0.64 brass. Information included on the tag will be:
1. Valve Type.
2. Service Line (i.e. Hot Water).
3. Sequential number associated with the project.

D. Utility Markers: Brady Identoline plastic tape, 6 inch.

E. Ceiling Markers: Standard label tape type.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide each piece of roof equipment with a manufacturer's standard nameplate indicating manufacturer's name, model number, capacities and characteristics.

B. In addition, provide each piece of equipment with a plastic tag indicating its designation on this project and the area served. Mount this tag with screws, where possible, in a clearly visible location.

C. Affix piping markers to pipe or insulation in locations that make them clearly visible. Secure markers with two wraps of "Scotch Reinforced Tape" at each end.

D. Locate markers at intervals of 15 to no more than 50 feet allowing visual identification of a line from any point along that line and as follows: Within 12 inches of each valve, where a pipe passes through a wall, direction of flow on each leg of a "T" and on lower quarters of the line on horizontal runs where view is not obstructed.

E. Provide arrow markers to indicate direction of flow away from each pipe identification marker.

F. Affix valve tags to valves using brass chain.
1. Provide an approved copy of the valve schedule in each Operation and Maintenance Manual.
2. Furnish one copy of the schedule framed under glass to the owner's representative
3. Information will include:
    a. Valve locations by plan room number.
    b. Function of the valve (i.e. equipment isolated).
    c. Service Line (i.e. Hot Water).

G. Provide plastic tape utility markers over all buried piping. Provide identification on tape. Install over the entire length of the underground piping utilities. Install plastic tape along both sides and the centerline of the trenches, at the elevation of approximately 12 inches above the top of utility.

H. Provide ceiling labels for all equipment located above drop or hard ceilings. The markers shall indicate the equipment symbol associated with the contract documents and the type of equipment. Locate the labels per the following:
1. Lay-in Ceiling - Locate the label on the ceiling grid member closest to the equipment location.
2. Hard Ceiling - Locate the label on the access panel servicing the unit or closest access point.

I. Provide valve chart indicating valve tag number, service, location and normal operation position of valve.

J. Valve chart location: Boiler room office wall, framed with glazed cover.

END OF SECTION

SECTION 22 07 19

PLUMBING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Work included: Providing of all required insulation for equipment.

1.2 SUBMITTALS

A. Provide submittals in accordance with Section 22 00 00.

B. Submittals shall include:
1. Data to show compliance with flame and smoke rating.
2. Manufacturer's catalog or technical data showing performance, dimensions, materials of construction and recommended methods of installation.

1.3 QUALITY ASSURANCE

A. Insulation materials and accessories such as adhesives, cement, etc. shall have composite fire and smoke hazard ratings, as tested by procedures indicated in NFPA 255 and U.L. 723, not to exceed a flame spread index of 25 and a smoke developed index of 50. Products or their shipping cartons shall have identification of the flame spread and smoke developed index.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Schuller, Knauf, Owens-Corning, Certain-teed, or approved equal. Schuller used as basis of selection.

2.2 DESCRIPTION

A. Domestic Water Insulation
1. Manville Micro-Lok AP-T molded fiberglass.
2. Pipe fittings: Zeston one-piece premolded PVC covers with fiberglass blanket insulation.
3. Foam filled elbows are not acceptable.

B. Closed Cell foam insulation is acceptable in locations on PEX piping where use will limit damage and extra demolition required for installation of specified fiberglass insulation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Piping:
1. Domestic Cold Water: Provide 1/2-inch minimum pipe insulation on domestic cold water piping.
2. Domestic Hot Water and Hot Water Return:

a. Provide 1-inch pipe insulation on domestic hot water and domestic hot water return less than or equal to 2 inches diameter.
b. Provide 1-1/2 inch pipe insulation on domestic hot water and domestic hot water return greater than 2 inches.

3. Insulate fittings on piping utilizing preformed pipe covering.
4. Insulate all valve bodies, fittings, unions, flanges and equipment with insulation equal to the attached service piping.
5. Seal all insulation to maintain a vapor barrier.
6. Provide 1-inch pipe insulation on horizontal storm/overflow storm drain piping and roof/overflow roof drain bodies. Seal all insulation to maintain a vapor barrier.

END OF SECTION

SECTION 22 11 00

FACILITY WATER DISTRIBUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Work included: Providing of all required pipes and pipe fittings.

B. All pipes, fittings, pumps, valves, faucets, etc. which serve domestic water systems shall be lead-free.

1.2 OPERATION AND MAINTENANCE DATA

A. Submit certificates of inspections and tests to owner.

1.3 QUALITY ASSURANCE

A. Piping material and installation to meet requirements of the local plumbing, fire and building codes and serving utility requirements.

B. Pipe Cleaning: Should any pipe be plugged, the piping shall be disconnected, cleaned and reconnected without additional cost to Owner.

C. Damage to the building or systems resulting from failure to properly clean the system shall be corrected without additional expense to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Pipe and fittings: Standard product of manufacturer.

B. Flexible connectors: Anaconda, Aeroquip or approved equal.

C. Seismic/expansion joint flex piping: Unisource, Metraflex, Mason. For other manufacturers, submit substitution request.

2.2 DESCRIPTION

A. Copper Pipe - Plumbing:

1. Pipe: Hard drawn copper type "L" above grade and hard drawn copper type "K" below grade, ASTM B88.
2. Fittings: Wrought copper solder type.
3. Solder
   a. Above ground: 2" and smaller - Lead free, 95-5, tin silver and flux.
   b. Below ground: 2 1/2" and larger - Lead free, brazing alloy and flux.
4. **Type K copper (brazed) is acceptable for 3” and larger domestic water piping above grade.**

B. Cross Linked Polyethylene (PEX) Domestic Water Tubing and Fittings:Allowed for 2” and smaller domestic waeter distribution piping

1. Pipe and Fittings: Wirsbo Aquapex for potable water distribution conforming to ASTM F 876-93/ASTM F 877-93 and certified to NSF standards 14 and 61.
2. Wirsbo Propex brass manifolds and fittings.
3. All pipe, manifolds and fittings to be of same manufacturer.

C. Ductile Iron Water Pipe: 3” and larger **below grade.**

1. Pipe: Ductile iron, conforming to AWWA C151/A21.51-91, 150 psi, cement lined and outside coated with bitumastic enamel.
2. Fittings: Mechanical joint, conforming to AWWA C110/a21.10-93, 250 psi.

PART 3 - EXECUTION

3.1 PREPARATION - MEASUREMENTS, LINES AND LEVELS

A. Check dimensions at the building site and establish lines and levels for the work specified in this Division.

3.2 PIPING INSTALLATION

A. Install water distribution system sized in conformance with the drawings.

B. Install unions in all non-flanged piping connections to apparatus and adjacent to all screwed control valves, traps, and appurtenances requiring removal for servicing, so located that piping may be disconnected without disturbing the general system.

C. Provide easily accessible shut off valves on each branch of piping, to facilitate maintenance and repair without shutting down supply to large sections of the building.

D. Install all piping as to vent and drain.

E. Support all piping independently at apparatus so that the equipment shall not carry its weight.

F. Dielectric Fittings: Provide dielectric couplings, unions or flanges between dissimilar metals. Additionally, provide dielectric couplings as required to isolate cathodically protected piping and equipment. Fittings shall be suitable for the pressure and temperature to be encountered.

G. Domestic water piping joints
1. Above ground:
   a. 2" and smaller - soldered.
   b. 2-1/2" and larger and all below grade installations - brazed.
2. Below ground: Brazed.

H. Screwed Joints: Ream pipe ends. Apply dope or tape to male threads only. Brass joints shall be made with Teflon tape only. Make up fitting with not over two threads showing beyond the fitting end. Make junctions of galvanized pipe to cast iron with tapped spigots or half couplings screwed to the end of galvanized pipe to form a spigot end.

I. Solder Type Joints:

1. Clean the copper tubing and fittings thoroughly with steel wool before applying the flux. The copper tubing shall have all burrs removed, be reamed to full bore, and be true and round for all joints.
2. Apply heat uniformly to secure penetration of the filler material. Leave full bead around the entire circumference of the joint to show proper penetration and sealing.
3. Flux shall not be used for copper-to-copper joints. Flux shall be used for joining copper to brass or bronze. In those cases where flux is used, particular care shall be exercised in applying the flux to avoid leaving any excess inside the completed joints.

J. Provide flexible connectors at all piping connections to mechanical equipment.

K. Provide seismic bracing and support per SMACNA "Seismic Restraint Manual Guidelines for Mechanical Systems", see drawings for Seismic Hazard Level.

L. Provide expansion loops/fittings as noted on the drawings and where piping passes through building expansion/seismic joints. Install the loops in accordance with the manufacturers instructions. Provide hangers and guides as recommended.

M. Flush piping system of all construction dirt.

N. Chlorination: Disinfect the domestic hot and cold water piping as follows:
1. Fill systems with a solution of 50 ppm available chlorine for four hours
2. During this time, open and close all valves at least twice.
3. Flush the system with water until the residual chlorine content is not more than 1 ppm.
4. Post flush; test 36 hours later for taste and smell. Flush until free of odor and taste.

O. Test piping system per Section 22 05 93.

3.3 SPECIALTIES INSTALLATION

A. Install all piping specialties where shown on the drawings and in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 22 42 00

COMMERCIAL PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Work included: Providing of all plumbing fixtures, fixture trim, cleanouts and appurtenances as shown or required.

B. Product Certification: Provide only products certified for use in the State of Oregon.

1.2 SUBMITTALS

A. Provide submittals in accordance with Section 22 00 00.

B. Submittals shall include manufacturer's catalog literature for all products used.

1.3 OPERATION AND MAINTENANCE DATA

A. Provide O&M data in accordance with Section 22 00 00.

B. O&M data shall include:
1. Manufacturer's literature.
2. Maintenance instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Drinking Fountains: Elkay.

B. Cleanouts: Jay R. Smith, Wade, Watts Ancon or Zurn.

2.2 DESCRIPTION

A. Drinking Fountain (DF-1):
1. Elkay EZH2O Bottle filling station & Bi Level ADA Cooler Model EMABFTLDDWSSK: Bi-level ADA,. Sensor activated bottle filler, lead free design. Provide with cane skirt Elkay 98324C as required for ADA compliance.
2. Floor mounted wall carrier, mount at standard or wheel chair height at each location as shown on architectural plan.
3. Aqua Pure AP101T water filter.

B. Cleanout: J.R. Smith, Fig. 4021-U, nickel bronze top with vandal proof screws for floor and bronze plug, Fig. 4556-NB cleanout tees with bronze plug, nickel bronze frame with stainless steel cover for walls, Fig. 4243-U cleanout for exterior planting and paved areas, cast iron with bronze plug.

C. Supplies and Stops: Flexible supplies with IPS stops with brass stems to wall with canopy flanges and all exposed surfaces chrome plated.

D. Traps:
   1. Exposed Traps: 17-gauge chrome plated tubing adjustable P-trap with slip bushing.
   2. Concealed or Below Grade: Coated cast iron P-trap, recessed screw joint or to match cast iron pipe.
   3. Support Rims: Stainless steel rims, if sink not furnished with integral rim.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide plumbing fixture trim where applicable on fixture.

B. Plumbing Fixtures:
   1. Plumbing Fixtures Mounting Heights: All fixtures standard rough-in catalogued heights unless specified or shown otherwise on the architectural drawings.
   2. Cleanout:
      a. Where required for purposes intended.
      b. Cover set flush with finished surface.
      c. Urinal cleanouts to be below fixture on centerline.

C. Provide all required cleanouts and fittings for installation.

END OF SECTION

SECTION 23 00 00

GENERAL MECHANICAL REQUIREMENTS

PART 1 – GENERAL

1.1 OTHER REQUIREMENTS

A. The Bidding, General and Supplementary of this project manual and specific sections as noted apply to the work specified in Mechanical Division 23 which encompasses Sections 23 00 00. This Section 23 00 00 applies to all sections of Mechanical Division 23.

1.2 SCOPE

A. It is the intent of these specifications and the accompanying drawings to describe complete mechanical systems installations for all building areas, new and renovation.

B. Furnish and install all material, labor and equipment in accordance with these documents.

1. Include all incidental items and work not specifically shown or specified but required by good practice in a complete system.
2. The drawings and specifications are complementary. What is called for in one shall be called for in both.
3. The drawings are diagrammatic but should be followed as closely as possible. Where required by jobsite conditions, relocate and provide fittings, etc., as required. Provide an allowance in the contract bid to furnish additional pipe and ductwork fittings required for coordination with structure and other construction trades.

1.3 DEFINITIONS

A. Or approved equal: Requires approval prior to bid date.

B. Indicated:

1. The term "indicated" is a cross reference to details, notes, or schedules on the drawings, other paragraphs or schedules in the specifications, and similar means of recording requirements in the Contract Documents.
2. Where terms such as "shown," "noted," "scheduled," and "specified" are used instead of "indicated," it is for the purpose of helping the reader locate the cross reference, and no limitation of location is intended except as specifically noted.

C. Directed, Requested, Etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by the Engineer," "requested by the Engineer," etc. However, no such implied meaning will be interpreted to extend the Engineer's responsibility into the Contractor's area of construction supervision.

D. Site or Project Site: The space available to the Contractor for the performance of the work, either exclusively or in conjunction with others performing the work as part of the project. The extent of the project site is shown on the Mechanical drawings and is not identical with the description of the land upon which the project is to be built.

E. Approved:
   1. Where used in conjunction with the Architect's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the meaning of the term "approved" will be held to the limitations of the Architect's responsibilities and duties as specified in the General and Supplementary Conditions.
   2. In no case will "approval" by the Architect be interpreted as a release of the Contractor from responsibilities to fulfill requirements of the Contract Documents.

F. Provide: The term "provide" means to furnish and install, complete and ready for the intended use.

1.4 STANDARDS AND CODES

A. Provide all equipment and material and perform all work in accordance with all local, state and national codes and regulations.

B. For work on this project, comply with appropriate standards published by the following:

1.	Air Diffusion Council	ADC
2.	American Gas Association	AGA
3.	Air Movement and Control Association	AMCA
4.	American National Standards Institute	ANSI
5.	Air-Conditioning and Refrigeration Institute	ARI
6.	Acoustical Society of America	ASA
7.	American Society of Heating, Refrigerating and Air-Conditioning	ASHRAE
8.	American Society of Mechanical Engineers	ASME
9.	American Society for Testing and Materials	ASTM
10.	City of Hillsboro, Oregon.	
11.	Washington County, Oregon	
12.	National Environmental Balancing Bureau	NEBB
13.	National Electrical Manufacturers Association	NEMA
14.	National Fire Protection Association	NFPA
15.	Sheet Metal and Air Conditioning Contractors' National Association	SMACNA
16.	Underwriters' Laboratories	UL
17.	Oregon Structural Specialty Code - current edition	OSSC
18.	Oregon Mechanical Specialty Code - current edition	OMSC
19.	Oregon State Energy Efficiency Specialty Code – current edition	
20.	Oregon Plumbing Specialty Code - current edition	OPSC

1.5 APPROVAL OF EQUIPMENT AND MATERIALS

A. Manufacturer's trade names, catalog numbers and material specifications used in this specification are intended to establish the quality of equipment or materials expected. Materials and manufacturers not listed require approval prior to the bid date.

B. Approval of substitute equipment or materials will be based upon performance, quality and other factors deemed important by the Architect. The Contractor will be responsible for making all changes in this and other associated work required as a result of the substitution. Additional or modified structural calculations and roof penetrations required to accommodate the substitution will be the responsibility of the contractor.

1.6 SUBMITTALS

A. Transmit submittals for review through e-Builder.
B. Furnish performance data and technical information on all materials and equipment to be used on the project.
C. Review of submittals or shop drawings by the Architect does not relieve the Contractor from the requirements of the Contract Documents unless specific approval has been requested for a given deviation.

1.7 QUALITY ASSURANCE

A. Maintain the highest standards of workmanship throughout the project.
B. Use the latest editions of applicable and specifically referenced standards.
C. Inspect all material and equipment upon arrival at the site and return any which is not in new condition.

PART 2 – PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 COORDINATION

A. Cooperate with other trades to assure that construction proceeds in an orderly and timely manner. Contract cost increases due to improperly sequenced work with other trades will not be allowed.
B. Study the new and existing architectural, structural, electrical, shop and any specialty drawings as appropriate and specifications to determine required coordination.
C. Prepare detailed shop drawings where necessary to assure proper fit and necessary clearance.
D. Refer to electrical drawings to verify voltage and phase of mechanical equipment.

1.8 PERMITS, FEES AND INSPECTIONS

A. Obtain all required permits and pay for all fees and connection charges.
B. Schedule any required inspections.

1.9 MATERIALS AND WORKMANSHIP

A. Furnish all materials and equipment in new condition, free from defects and of size, make, type and quality specified. Installation shall be in a neat and workmanlike manner.
B. When two or more items of the same kind, type or class are required, use items of a single manufacturer.

1.10 MEASUREMENTS

A. Take all measurements from reference datums established by the mechanical contractor.

1.11 DELIVERY, HANDLING AND STORAGE

A. Receive all material and equipment at the jobsite or shop.
B. Use proper and sufficient equipment to handle all products employed in the project.
C. Where storage of material or equipment is necessary, it shall be a clean and weatherproof area. Seal any openings and cover the product to assure that there will be no corrosion or foreign matter introduced. Assure that it will be in new condition when placed in service.

1.12 EQUIPMENT INSTALLATION, BRACING AND SUPPORT

A. Install all equipment in strict accordance with the manufacturer's instructions unless otherwise indicated.
B. The drawings in general are based upon one of the specific manufacturers listed for a particular equipment item. The other specified manufacturers and additional approved manufacturers of equipment may require deviations from the drawings to properly install the particular equipment in accordance with the manufacturer's recommendations and to provide the system results required. Provide all work necessary in the base bid price to install this equipment.
C. Where the installation shown or specified is contrary to the manufacturer's instructions, advise the Architect in writing of the differences before proceeding with the installation.
D. Anchorage to Floors, Roofs, Etc., Sway Bracing and Seismic Restraints:
   1. The contractor is responsible to determine the means and methods of equipment installation and support.
   2. Provide supports for all apparatus as specified, detailed, as required by the manufacturers of specific equipment and the project governing code authorities. Anchor all roof and base/floor mounted equipment with size and spacing of anchor bolts or other attachment means as recommended by the respective equipment manufacturer.
   3. Provide seismic restraints on all mechanical equipment in conformance with the current Oregon Structural Specialty Code, Section 1613 "Earthquake Loads" and ASCE 7. Costs for seismic calculations are to be included in the bid price.
   4. Provide deferred submittals directly to the governing code jurisdiction for anchorage to floors, roofs, etc., sway bracing and seismic restraints. Submittals to show locations and sufficient support details as required by the governing code jurisdiction.
   5. Provide supplementary drawings and calculations as required by governing code jurisdictions noting seismic support data/calculations as required for permit purposes.
   6. Mechanical seismic criteria is as follows:
   a. Occupancy Classification II
   b. Seismic Design Category D
   c. Component Importance Factor (Ip)
      1) Natural gas systems and components 1.5
      2) Other mechanical components 1.0
E. Maintain a copy of the manufacturer's installation instructions at the jobsite for all equipment.
F. The presence of above ceiling equipment items shall be marked using label tape markers affixed to the ceiling grid. The markers shall indicate equipment category and equipment number. Coordinate color-coding and lettering requirements with the owner's representative.

1.13 SLEEVES AND INSERTS

A. Provide sleeves at all locations where piping and ductwork passes through building construction.
B. Sleeves for interior walls and floors shall be 22 gauge galvanized or heavier as required. Sleeves for exterior walls shall be cast iron, wall thickness as required.

1. Wall sleeves shall be installed in all exterior walls and all interior masonry or fire-rated walls in a manner that preserves the fire-rated or watertight integrity of the wall.
2. Interior wall sleeves for uninsulated pipe shall allow minimum 1/4-inch clearance all around pipe for pipe movement. Allow 1-inch clearance around pipe at building expansion joints.
3. Interior wall sleeves for insulated piping shall be selected to encompass the pipe and insulation and allow minimum 1/4-inch clearance around insulation for pipe movement. Allow 1-inch clearance around pipe and insulation at building expansion joints.

C. Seal space between pipe and sleeve with Dow Corning Fire Stop System, 3M Brand CP25 or approved equal where piping penetrates firewall or floors. Sealant must be between pipe and sleeve; sealant between insulation and sleeve is not acceptable. Install firestop materials in complete accordance with the manufacturer's instructions and in compliance to applicable UL listings.

1.14 FLOOR, WALL AND CEILING PLATES

A. Provide escutcheon plates where all exposed piping and ductwork passes through finished walls, floors and ceilings, including accessible cabinet spaces.
B. Floor plates: deep recessed, cast brass, chrome plated.
C. Wall and ceiling plates: spun aluminum, chrome plated.
D. Secure plates to pipe or structure. Plates shall not penetrate insulation vapor barriers. Size plates to sufficiently cover pipe sleeves and openings in finish materials.

1.15 ACCESS DOORS AND PANELS NOT SPECIFIED IN THE ARCHITECTURAL DOCUMENTATION

A. Manufacturers: Cesco, Milcor, Elmdor. Cesco used as basis of selection.
B. Non-rated panels: Style W, SR-1, SR-2, P, PX as required for wall or ceiling construction, 12 inch x 12 inch or larger as required for ease of access.
C. Fire-rated panels: Style FB, U.L. listed for 1-1/2 hr for fire rated stud and masonry wall systems.
D. Provide access panels where shown on the drawings or as required for proper access to mechanical appurtenances. Coordinate the installation of access panels is with the specific building construction penetrated. Coordinate access panel installation with Manufacturers instructions.
E. Locate and size access doors to facilitate equipment service and optimize the safety of the maintenance personnel. Minimum access door size to be 18"x 18".

1.16 PROTECTION

A. Protect all work, material and equipment from loss or damage until the Owner accepts the project.
B. As the work progresses, keep all equipment covered and cap all ducts and piping that may temporarily be left unconnected.
C. Notify all other trades of any required precautions necessary to protect the work.

1.17 ACCESSIBILITY

A. Provide convenient access by location or access panel to all equipment requiring periodic service.

1.18 RELATED WORK

A. The following work and materials are specified elsewhere:
1. Pipe chases, equipment pads and foundations, trenches, painting, air louvers, louvered penthouse and access panels except as otherwise specified in this division.

2. Framed openings, wood grounds and nailing strips, masonry, concrete and other architectural and structural elements.

1.19 CLEANING

A. Maintain premises and public properties free from accumulations of waste, debris and rubbish during construction.
B. Clean all mechanical equipment of dust, grease, iron cuttings, unnecessary stamps or shipping labels, etc.
C. Touch up factory-painted surfaces, as necessary, with paint of matching color.

1.20 RECORD DRAWINGS

A. Maintain one set of construction drawings at the jobsite for the sole purpose of recording work of the mechanical contract, as actually installed. Upon request, the Architect will make the original tracings available to the mechanical contractor for printing the drawings. The Contractor shall pay the reproduction costs.
B. Record all piping and ductwork by dimensions from gridlines, below grade, above floor, etc. Show location of all access panels, cleanouts, rough-in for future, etc.
C. Make record drawings available to the Architect for review or reproduction during construction. The Architect will pay any printing costs.
D. Deliver record drawings to the Architect promptly upon completion of the project.

1.21 OPERATION AND MAINTENANCE MANUALS:

A. Submit a copy of the Operation and Maintenance Manual to the e-Builder before project completion. Operation and Maintenance Manuals shall include the following:
B. Directories:
1. Supplier Directory: Alphabetical list of principal subcontractors and suppliers of equipment giving names, addresses and telephone numbers.
2. Equipment Directory: List of equipment installed such as fans, air supply units, pumps, heating and cooling equipment, plumbing fixtures, etc., giving drawing reference numbers, location, area served, manufacturer with model number and supplier.
3. Manufacturer's Literature:
a. Show name, address and phone number of the nearest service facility authorized by the manufacturer.
b. Include illustrations, diagrams, and instructions for installation, startup, operation, inspections, maintenance, parts list, data sheets and other necessary materials.
c. Include complete electrical, schematic and connection diagrams for each equipment item.
d. Include the name, address and phone number of contractor(s) who furnished and who installed equipment and systems.
e. Where the literature covers more than one model, check off neatly in ink correct model number and data for the model number including all specified options.
f. In those instances where the equipment, its mode of control, or both, is job assembled for special functions, then provide written operating and maintenance instructions prepared by the assembler on 8-1/2" x 11" sheets.
C. Maintenance Instructions:
1. Where instructions for maintenance are not included in the manufacturer's literature, provide supplemental data to enable proper maintenance of the equipment installed.
2. Include specific lubrication methods and recommended frequencies along with procedures and precautions for inspection and routine service.
D. Copy of Written Guarantee.

E. Recommended Spare Parts Stock.

1.22 HVAC SYSTEMS TRAINING

A. Training must be on fully operational system, or the training must be repeated when the system is fully operational at no additional cost to the Owner. Training must be scheduled through the Beaverton School District representative at a time that is convenient to district personnel. The Beaverton School District representative must be notified of any changes, re-scheduling or modifications to the training schedule
   1. Maintain a start-up log notebook in the job trailer containing signed copies of the manufacturer's start-up sheets for all equipment.
   2. Training walk-throughs to be performed by a contractor field project manager or technician who is fully knowledgeable with the project specifics and has had continuous involvement during the course of the project. The individual is to be knowledgeable in the specific installation details and maintenance of the project equipment.

B. Custodial Training: At substantial completion prior to occupancy, this walk-through shall consist of a review of the project as-built drawings, the HVAC system layout and naming conventions, and a walk through of the facility to identify equipment and piping locations. This training will include Project Managers (as requested by the Beaverton School District) and custodial personnel per the Beaverton School District.

C. Maintenance Training: Maintenance training will take place in two separate sessions: One session to occur within 30 days after substantial completion. This session to include a detailed review of the HVAC system record drawings and equipment installation instructions. The instructor shall then walk through the building identifying the location of the equipment installed and specific function(s) related to the overall mechanical systems. The training shall include answering maintenance personnel questions, troubleshooting and diagnostics procedures, repair instructions and preventive maintenance. This training will include all maintenance staff per the Beaverton School District.

D. The maintenance training may occur consecutively with the operators training, but may not occur at the same time - The two sessions will be clearly separate and distinct.

E. Provide a written agenda to the attendees outlining the general scope of the training session and the building equipment involved.

F. The second session is to occur 10-months after substantial completion. The session shall be used to address observed operational issues. This training will include all maintenance staff per the Beaverton School District.

1.23 CUTTING AND PATCHING

A. Cut work as required for installation and patch to match original conditions as directed and approved by Architect. Do not cut structural portion without Architect's approval.

B. When masonry construction must be penetrated, provide a steel pipe sleeve in opening and grout in place in a neat manner. Leave grout surface to match existing finish.

C. Prior to cutting any existing work, locate all concealed utilities to eliminate any possible service interruption or damage.

1.24 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES

A. Contractors shall provide proper sizing when providing sleeves or core-drilled holes to accommodate the through penetrating items. All voids between sleeve or core-drilled hole and pipe passing through, shall be firestopped to meet the requirements of ASTM E-814.

B. Fire stop penetrations in accordance with the U.L. listed assemblies provided by the manufacturers of the products used.

1.25 CHANGE ORDERS

A. All supplemental cost proposals by the Contractor shall be accompanied with a complete itemized breakdown of labor and materials cost without exception.
B. Contractor's estimating sheets for the supplemental cost proposals shall be made available to the Architect. Labor must be separated and allocated for each item of work.

1.26 VERIFICATION OF EXISTING CONDITIONS

A. Verify field conditions and measurements prior to the manufacture of shop fabricated materials and equipment.
B. Produce shop drawings with details as required verifying proper installation of materials & equipment in conformance with applicable codes and the manufacturer's requirements.

1.27 SYSTEMS WIRING

	ITEM	FURNISHED BY	INSTALL BY	POWER WIRING	CONTROL WIRING
1.	Division 23 Equipment Motors	Div. 23	Div. 23	Div. 26	Div. 23
2.	Remote Motor Starters, Contactors and Overload Heaters – Integral	Div. 23	Div. 26	Div. 26	Div. 23
4.	Fused & Unfused Disconnect Switches	Div. 26	Div. 26	Div. 26	------
5.	Manual Operation Switches	Div. 26	Div. 26	Div. 26	Div. 26
6.	Control Relays & Transformers	Div. 23	Div. 23	Div. 23	Div. 23
7.	Building Management Controls (DDC)	Div. 23	Div. 23	Div. 23	Div. 23

1.28 COMMISSIONING

A. The contractor has specific responsibilities for scheduling, coordination, startup, test development, testing and documentation. Coordinate all commissioning activities with the Commissioning Authority.

END OF SECTION

SECTION 26 00 00

GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General electrical requirements.

1.2 PERMITS, FEES AND SERVICE CHARGES

A. The CONTRACTOR shall obtain all electrical permits required to complete the work and pay all associated fees.

B. The CONTRACTOR shall coordinate and provide for the installation and operation of franchise utility service (including any telephone and/or leased lines specified) as required during construction, startup, testing, and operation of the work until substantial completion.

1.3 CONTRACTORS RESPONSIBILITY FOR FIELD VERIFICATION OF EXISTING CONDITIONS

A. The CONTRACTOR shall be responsible for performing field verification of the existing conditions prior to bidding. Then nature of this work inherently requires field observation to understand the existing conditions and scope of work.

B. Failure to observe the existing conditions or ignorance of existing conditions shall be the responsibility of the CONTRACTOR alone. Additional services may not be authorized due to the CONTRACTOR'S lack of understanding of the existing conditions.

1.4 CONTRACTOR'S RESXPONSIBILTY FOR SHUTDOWNS AND MAINTAINING EXISTING SYSTEMS

A. Shutdowns of any Division 26, 27, 28 system shall be coordinated with the OWNER prior to performing the shutdown. The CONTRACTOR shall provide the OWNER with a written schedule identifying the system, duration, and impact on the OWNER'S facility.

B. Existing Division 26, 27, 28 systems not impacted by the work in this project shall be protected and maintained during construction. Any system not identified on the Drawings or within these Specifications shall be brought immediately to the attention of the ENGINEER and OWNER.

1. The CONTREACTOR shall be responsible for bearing the cost of repairing or restoring all electrical systems that are disrupted or damaged during construction. The system shall be repaired and restored to their original condition.

1.5 INTENT OF DRAWINGS AND SPECIFICATIONS

A. Riser and other diagrams are schematic and are intended to show the approximate location of equipment, and the general alignment of conduits and piping, and shall not be used for obtaining quantities. Dimensions given on the plans shall take precedence over scaled dimensions and all dimensions whether in figures or scaled, shall be verified in the field.

B. The electrical drawings do not show complete details of the site conditions. The CONTRACTOR shall check actual conditions.

C. The exact location of apparatus, fixtures, equipment, conduit and piping shall be ascertained by the CONTRACTOR in the field, and the work shall be laid out accordingly. Should the CONTRACTOR fail to ascertain such locations or coordinate with work performed by other trades, the work shall be changed at no additional cost to the OWNER when so ordered by the ENGINEER. The ENGINEER reserves the right to make minor changes in the location of conduit, piping and equipment up to the time of installation without additional cost to OWNER.

D. CONTRACTOR shall provide all labor, materials, equipment, machinery, and tools necessary to provide all electrical equipment specified and shown on the Drawings. All items not specified in detail or shown on the Drawings but necessary for complete installation shall be provided by the CONTRACTOR.

1.6 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Submittals shall be in accordance with the requirements of these Contract Documents and shall include the following:

1. Submittals shall include information and literature as required for all equipment and materials provided under this and related sections.
2. Shop Drawings: Shop drawings shall include the following along with any special requirements listed in the individual Specification Sections:

    a. Installation instructions and drawings
    b. Wiring schematics with termination point identification
    c. Materials of construction
    d. Manufacturer’s name and model
    e. Manufacturer’s catalog data

3. Manufacturers’ Literature: Literature indicating the compliance of the products with the Specifications shall be included with all submittals. This shall include catalogs and other descriptive bulletins. Relevant portions of the literature shall be clearly identified by highlighting or underlining.
4. Test Logs: The CONTRACTOR shall submit test logs as outlined below and as specified in subsequent electrical sections and drawings.

    a. A log of the complete results of tests for shorts and grounds for each circuit. All circuits and tests shall be clearly identified.

b. A log of complete results of insulation resistance measurements of each circuit. All circuits and tests shall be clearly identified.

5. Operation and maintenance information for all equipment furnished and/or installed.
6. Programming instructions for any controllers or other programmable equipment. Copies of the any required software, including registration cards, shall be provided with the O&M manuals.

C. Deferred Submittals

1. Submittals for seismic bracing/anchoring and wind loads shall be a deferred submittals. Engineering of the seismic bracing and anchoring system shall be provided by a licensed Engineer in the State of Oregon. Submittals shall include calculations and drawings, including connection types/materials/sizes, load, maximum load, dimensions, etc.

D. The CONTRACTOR shall indicate on the submittals all variances from the Specifications.

E. Record Drawings. After the completion of construction, the CONTRACTOR shall provide one set of "as-built" drawings to the ENGINEER as specified herein showing the location of buried conduits and all changes or deviations from the original drawings.

F. Final inspection certificates shall be submitted prior to final payment.

1.7 COORDINATION OF WORK

A. The CONTRACTOR shall plan his work in coordination with the other trades and with the power and telephone utility authorities.

B. The CONTRACTOR shall field verify all dimensions of equipment to be installed or provided by others so that correct clearances and connections may be made between the work installed by the CONTRACTOR and equipment installed or provided by others.

C. The CONTRACTOR shall arrange all conduit runs so that they do not interfere with piping, structural members, etc.

D. All working measurements shall be taken from the sites, checked with those shown on the drawings, and if they conflict, reported to the ENGINEER at once, and before proceeding with the work. Should the CONTRACTOR fail to comply with this procedure, he shall alter his work at his own expense as directed by the ENGINEER.

E. No additional payments will be allowed where obstructions in the work of other trades, or work under this contract requires offsets to conduit runs.

F. The CONTRACTOR is responsible for all alterations in the work to accommodate equipment differing in dimensions or other characteristics from that shown or specified.

G. The CONTRACTOR shall provide all temporary power necessary for existing site equipment and for all construction needs.

1.8 SUPERVISION

A. The CONTRACTOR shall maintain adequate supervision of the work and shall have a responsible person in charge at the site during all times that work under this contract is in progress, or when necessary for coordination with other work.

1.9 CODES

A. Work shall conform to the National Electrical Code (NEC), and State Codes and other applicable codes, even though not specifically mentioned for each item. These shall be regarded as the minimum standard of quality for materials and workmanship.

1.10 CONTRACTOR'S RECORD DRAWINGS & AS-BUILTS

A. The CONTRACTOR shall maintain a neatly marked set of record drawings showing the locations of all buried conduits and other utilities encountered or installed during construction. The final locations of panels, field mounted instruments and panels, terminal boxes, junction boxes, receptacles, light switches and other materials included in the work shall be shown, as well as conduit routing between them to the extent it differs from the design drawings. Record drawings shall be kept current with the work as it progresses and shall be subject to inspection by the OWNER's Representative at any time. Failure to keep field record drawings current may result in the issuance of a stop work order or delay in the processing of pay requests until the record drawings are made current.

B. The CONTRACTOR shall provide one complete set of as-built electrical schematics for all panels and equipment provided, including PLC I/O schematics as applicable, panel elementary diagrams, interconnecting wiring diagrams, wire numbers, termination strip locations and numbers. These shall be in the same format and style as those in the Contract Documents and submittal requirements.

C. All information shown on the CONTRACTOR's field record drawings and as-built schematics shall be subject to verification by the OWNER's Representative. If significant errors or deviations are noted by the OWNER's Representative, new as-builts shall be completed at the CONTRACTOR's expense.

PART 2 - PRODUCTS

2.1 PORTABLE OR DETACHABLE PARTS

A. All equipment shall be demonstrated to operate in accordance with the requirements of this specification and the manufacturer's recommendations.

2.2 NEW PRODUCTS

A. All products shall be new without defects and covered by Manufacturer's warranty. Products shall be re-used only where indicated on the Drawings.

B. All products shall be listed, labeled, and certified by a testing agency approved by the state of Oregon.

C. All equipment of the same type and capacity shall be by the same manufacturer.

PART 3 - EXECUTION

3.1 WORKMANSHIP & COORDINATION

A. All work shall be performed by personnel skilled in the particular trade in a workmanlike manner. Workmanship shall conform to the standards of the NEC and the National Electrical Installation Standards (NEIS).

B. The ENGINEER shall be the sole judge as to whether or not the finished work is satisfactory; and if in his judgment any material or equipment has not been properly installed or finished, the CONTRACTOR shall replace the material or equipment whenever required, and reinstall it in a manner entirely satisfactory to the ENGINEER without any increase in cost to the OWNER.

C. The CONTRACTOR shall coordinate and verify the installation of all equipment furnished by him to other trades, or equipment provided and installed by other trades that is connected to the electrical or control systems. Work shall include the furnishing of all labor, materials, and equipment required for the installation of a complete and operable system as hereinafter specified and as indicated on the drawings. The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. Unless otherwise specifically stipulated, the term "furnished and installed complete" shall be considered a part of this section.

3.2 SUPPORT BACKING

A. Provide any necessary backing required to properly support all fixtures and equipment installed under this contract.

3.3 CUTTING, PATCHING AND FRAMING

A. The CONTRACTOR shall determine in advance the locations and sizes of all sleeves, chases, and openings necessary for the proper installation of his work.

B. Whenever practical, inserts or sleeves shall be installed prior to covering work. Cutting and patching shall be held to a minimum. All required holes in concrete construction shall be made with a core drill and patched with non-metallic non-shrink grout.

C. Cutting, fitting repairing and finishing of carpentry work, metal work, or concrete work, and the like, which may be required for this work shall be done by craftsmen skilled in their respective trades. When cutting is required, it shall be done in such a manner as not to weaken walls, partitions, or floors; and holes required to be cut in floors must be drilled without breaking out around the holes.

3.4 ACCESS PANELS

A. The CONTRACTOR shall provide all access panels in hard ceilings to allow NEC-required access to junction boxes, pull boxes, and light fixtures. The CONTRACTOR shall submit to the ENGINEER for approval floor plans (1/8" = 1'-0" scale minimum) which clearly indicate proposed access panel locations.

3.5 TESTS

A. The CONTRACTOR shall furnish all labor, material, instruments and tools to make all connections for testing of the electrical and instrumentation installation. All equipment shall be demonstrated as operating properly prior to the acceptance of the work. All protective devices shall be operative during testing of equipment. The tests shall be made under the supervision of the ENGINEER. All deficiencies or unsatisfactory conditions as determined by the ENGINEER or inspecting authorities shall be corrected by the CONTRACTOR in a satisfactory manner at his own expense.

B. After visual inspection of joints and connections and the application of tape and other insulating materials, all sections of the entire wiring system shall be thoroughly tested for shorts and grounds. A log of results for each circuit shall be kept by the CONTRACTOR and presented to the ENGINEER.

C. A phase rotation check shall be made to demonstrate that all power receptacles, service feeders, main power feeders and auxiliary power generators have the same A - B - C phase rotation and ground relationships.

D. Equipment shall be tested by operating all switches, etc., sufficiently to demonstrate proper installation and electrical connections. Control and emergency conditions shall be artificially simulated where necessary for complete system or subsystem.

3.6 CLEANING AND TOUCH-UP PAINT

A. Upon completion of work, all electrical equipment shall be cleaned.

1. Vacuum all dirt, metal shavings, and foreign materials from all enclosures. The use of compressed air shall not be acceptable.
2. All stains, dirt, and fingerprints shall be removed from switchboards, motor control centers, panelboards, light fixtures, enclosures, and all other electrical equipment covers.

B. Provide touch-up paint on equipment that has been scraped, scratched, or chipped during construction. Paint color shall match color of equipment.

END OF SECTION

SECTION 26 01 08

ELECTRICAL TESTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Electrical and control testing forms and requirements.

1.2 REFERENCES

A. National Fire Protection Association (NFPA):

1. 70, National Electrical Code (NEC).

1.3 SEQUENCING

A. ENGINEER shall issue written acceptance of the following certifications submitted by the CONTRACTOR before utility power is supplied to conductors, cables, or equipment.

1. Megger Test
2. Continuity Test
3. Receptacle Acceptance Test

B. CONTRACTOR shall verify to ENGINEER that every function of the electrical, measurement, and control systems are operating properly.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. Site Tests, Inspection

1. CONTRACTOR shall be responsible to become familiar with the test and certification requirements of the Contract Documents for this project. It is the intent of these requirements that the Work will be systematically checked to verify that the functions required or implied, work properly to insure safety for the personnel, environment, and equipment associated with the Work.
2. CONTRACTOR shall complete the certification forms that are supplemental to this section and submit the forms to ENGINEER for approval.
3. All site test and inspection certificates and schedules shall be contained in a 3-ring binder(s).

a. Size 8½ inches by 11 inches.
b. Paper: 20-pound minimum, white for typed pages.
c. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
d. Provide each manual with title page to include “Process Electrical Testing”, typed table of contents with consecutive page numbers. Where more than one binder is used, consecutively title each with a volume number. The first binder shall be

labeled Volume 1 and consecutively numbered as required to include all test documentation.

e. Tab sections for each required section of testing and acceptance certification.

4. CONTRACTOR shall notify ENGINEER seven days in advance of scheduled testing and facilitate the witnessing of those tests by ENGINEER.
5. CONTRACTOR shall provide ENGINEER with current as-built documentation for electrical and measurement and control commissioning with submittal of test certification.

a. Systems operating at or above 200-volts to ground or more shall be included in the Megger Test Certification. Minimum duration for each test shall be one minute, at 1000 VDC, and minimum acceptable results shall be 50 mega ohms.
b. Conductors and cables shall be included in the Continuity Test Certification. No continuity to ground is the only acceptable result of the test.
c. Conductors, cables, or equipment failing to meet the minimum requirements shall be replaced with new. Repair will not be acceptable.
d. Each individual instrument shall have an Instrument Calibration Certificate. The calibration shall operate within the tolerances specified by the manufacturer of the instrument and the Contract Documents.

B. Acceptance Testing for Receptacles and Electrical Equipment

1. The CONTRACTOR shall provide written verification of the testing.
2. Corrective measures required for equipment not provided by the Contractor shall be the responsibility of the equipment vendor.

3.2 SUPPLEMENTS

A. Schedule 260108 - A; Megger Test Certificate.

B. Schedule 260108 - B; Continuity Test Certificate

END OF SECTION

SUPPLEMENT 260108 - A
MEGGER TEST CERTIFICATE

		Project Number:
Test Equipment Manufacturer:	Model Number:	Project Name:
Test Equipment Last Calibration Date:	Serial Number:	Accepted By: Date:
Testing Personnel:	Calibration Certificate	Drawing Reference:
Test Voltage:	Test Date:	Title:
		Tag:

Title	Tag Identification	A-Ø/ B-Ø	A- Ø / C- Ø	A- Ø / Ground	B- Ø / Ground	C- Ø / Ground	A- Ø / Neutral	B- Ø / Neutral	C- Ø / Neutral

SUPPLEMENT 260108 - A
MEGGER TEST CERTIFICATE

		Project Number: *12345*
Test Equipment Manufacturer: *APC*	Model Number: *GH-1*	Project Name: *Water Diversion*
Test Equipment Last Calibration Date: *8/13/02*	Serial Number: *346321*	Accepted By: *S.E. Davis* Date: *01/01/2003*
Testing Personnel: *John Doe*	Calibration Certificate: *Yes*	Drawing Reference: *E-006*
Test Voltage: *1000 Volts*	Test Date: *12/17/02*	Title: *Power Distribution Diagram*
		Tag: *016*

Title	Tag Identification	A-Ø/ B-Ø	A- Ø / C- Ø	A- Ø / Ground	B- Ø / Ground	C- Ø / Ground	A- Ø / Neutral	B- Ø / Neutral	C- Ø / Neutral
Main Feeder	*016-CO3*	∞	∞	∞	∞	∞	∞	∞	∞
PNL-07	*016-CO7*	∞	∞	∞	∞	∞	∞	∞	∞
PNL-12	*016-C12*	∞	∞	∞	∞	∞	∞	∞	∞

SUPPLEMENT 260108 - B
CONTINUITY TEST CERTIFICATE

		Project Number:

		Project Number:
Test Equipment Manufacturer:	Model Number:	Project Name:
Test Equipment Last Calibration Date:	Serial Number:	Accepted By: Date:
Testing Personnel:	Calibration Certificate:	Drawing Reference:
	Test Date:	Title:
		Tag:

Permanent Tag Number	Function	Temporary Tag Number	Device ID Number	Ohms to Ground

SUPPLEMENT 260108 - B
CONTINUITY TEST CERTIFICATE

		Project Number: *12345*
Test Equipment Manufacturer: *Fluke*	Model Number: *53G*	Project Name: *Water Division*
Test Equipment Last Calibration Date: *Unknown*	Serial Number: *638842*	Accepted By: *S.E. Davis* Date: *01/01/2003*
Testing Personnel: *John Doe*	Calibration Certificate: *No*	Drawing Reference: *E-501*
	Test Date: *12/30/02*	Title: *Conduit Schedule*

Permanent Tag Number	Function	Temporary Tag Number	Device ID Number	Ohms to Ground
016-34-PNL	*Level Indicator*	*34*	*016-34*	∞

END OF SECTION

SECTION 26 05 19

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes.

1. The section includes the requirements for conductors and cables used to conduct potentials of 600 volts and less.
2. All conductors and cables shall be installed in conduit or approved raceways regardless of which Division the conductors or cables are specified.

1.2 REFERENCES

A. The following is a list of Standards which may be referenced in the Section.

1. American Society for Testing and Materials (ASTM).

a. B8, Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft.

2. National Electrical Contractors Association, Inc. (NECA): National Electrical Installation Standards (NEIS).
3. National Electrical Manufacturers Association (NEMA).

a. WC 3, Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
b. WC 5, Thermoplastic Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
c. WC 7, Cross Linked-Thermostetting Polyethylene Wire and Cable for the Transmission and Distribution of Electrical Energy.
d. WC 55, Instrumentation Cables and Thermocouple Wire.

4. National Fire Protection Association (NFPA). 70, National Electrical Code (NEC).
5. Underwriters Laboratories, Inc. (UL).

a. 13, Standard for Power-Limited Circuit Cables.
b. 44. Standard for Safety Rubber-Insulated Wires and Cables.
c. 62, Standard for Safety Flexible Cord and Fixture Wire.
d. 510, Standard for Safety Insulating Tape.
e. 854, Standard for Safety Service-Entrance Cables.
f. 910, Standard for Safety Test Method for Fire and Smoke Characteristics of Electrical and Optical Fiber Cables Used in Air Handling Spaces.
g. 1277, Standard for Safety Electrical Power and Control Tray Cables.
h. 1581, Standard for Safety References for Electrical Wires, Cables and Flexible Cords.

1.3 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260519.C01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data.

1. Pursuant to Section 01300 Submittal Procedures.
2. Manufacturer's data including materials of construction, weight, and related information for each item specified in PART 2 PRODUCTS.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Single Conductors (260519.C01).**

1. Conductors shall be rated for 600 volts and conform to applicable requirements of NEMA.
2. Conductors shall be stranded copper.
3. Insulation type shall be THWN-2. XHHW-2 in #10 AWG or smaller.
4. Conductors shall be sized per the Drawings and the NEC, whichever is greater.
5. Rome Cable Corporation, Southwire Company, Okonite Company, or approved equal.

B. **MC (Metal Clad) Cables (260519C25)**.

1. Shall be rated 600 volts and conform to applicable requirements of NEMA.
2. Conductors shall be stranded copper and shall be no larger than 10AWG.
3. Insulation type shall be THHN/THWN.
4. Armor material shall be high strength flexible galvanized steel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General.

1. Conductor and cable installations shall meet or exceed the NECA National Electrical Installation Standards.
2. CONTRACTOR shall not exceed the manufacturer's recommendations for maximum pulling tensions or minimum bending radii for respective conductors or cables.
3. Pulling compound is recommended for all conductor or cable installations and shall be used on all installations requiring a mechanical pulling device.
4. CONTRACTOR shall furnish and use a dynamometer on all conductor or cable installations requiring the use of a mechanical pulling device. The dynamometer shall be used to verify the maximum pulling tensions are not exceeded. Should the pulling tensions be exceeded, the conductor or cable shall be removed from the raceway and discarded. It shall not be reused under any circumstance on the project. The

CONTRACTOR shall be responsible to make the alterations necessary before attempting to re-pull new conductors or cables.

5. Immediately after pulling in conductors or cables, the pulling compound shall be completely removed from the conductors or cables, from boxes, enclosures, floors, walls, etc.
6. Conductor and cable installations shall be continuous without splices or intermediate terminations unless specifically identified on the Drawings or prior written approval from the ENGINEER.
7. Where conductors or cables are routed in boxes enclosures or cable tray they shall be neatly bundled with cable ties at intervals not to exceed 12 inches on center. The tension for the cable ties shall be set with a tool specifically manufactured for that purpose and of the same manufacturer as the cable tie. Side cutters, linemen pliers and similar tools shall not be used to cut the tail end of the cable tie. The CONTRACTOR shall only use the tool specifically manufactured for this purpose and of the same manufacturer as the cable tie.
8. Conductors and cables shall not be installed until the raceway, boxes, enclosures, conduit bushings, etc. have all been installed. Where conductors or cables have been installed prior to meeting this requirement, the ENGINEER shall at their discretion elect to have the conductors or cables removed, disposed of and replaced with new product.
9. Should the outer jacket of any conductor or cable be damaged in any way, they shall be removed, disposed of and replaced with new product.
10. An equipment grounding conductor shall be installed in all raceways. Size shall be as identified on the Drawings or the NEC, whichever is greater, but in no case shall it be less than # 16 AWG for under 50 volts and no less than # 14 for 50 volts or above.
11. Shared neutrals in any multi-wire branch circuits are not permitted.

B. MC Cable

1. MC Cable shall be used for branch circuits within a room space with accessible ceiling only. Homeruns are not allowed to utilize MC cable.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. The Section includes the requirements pertaining to conduits and fittings used to contain electrical conductors and cables.
2. All conductors and cables shall be installed in conduit or approved raceways regardless of which Division the conductors or cables are specified.

1.2 REFERENCES

A. The following is a list of standards which may be referenced in this Section.

1. American National Standards Institute (ANSI).

a. C80.1, Rigid Steel Conduit-Zinc Coated.

2. American Society for Testing Materials (ASTM).

a. A123 E1, Standard Specification for Zinc-Coated (Galvanized) Coatings on Iron and Steel Products.

3. National Electrical Contractors Association (NECA).

a. National Electrical Installation Standards (NEIS).

4. National Electrical Manufacturers Association (NEMA).

a. TC 3, PVC Fittings for use with Rigid PVC Conduit and Tubing.
b. TC 6, PVC and ABS plastic Utilities Duct for Underground Installation.

5. Nation Fire Protection Association (NFPA).

a. 70, National Electrical Code (NEC).

6. Underwriters Laboratories, Inc. (UL).

a. 6, Standard for Safety Rigid Metal Conduit.
b. 514B, Standards for Safety Fittings for Conduit and Outlet Boxes.
c. 651, Standard for Safety Schedule 40 and 80 PVC Conduit.
d. 651A, Standard for Safety Type EB and Rigid PVC Conduit and HDPE Conduit.
e. 1660, Standard for Safety Liquid-Tight Flexible Nonmetallic Conduit.
f. 360, Standard for Safety Liquid-Tight Flexible Metallic Conduit.
g. 797, Standard for Safety Electrical Metallic Conduit.

1.3 SUBMITTALS

A. Product data

1. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.
2. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
3. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260501.S01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
4. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.
5. Pursuant to Section 01 33 00 Submittal Procedures.
6. Manufacturer's data including materials of construction, equipment weight and related information for each item specified in PART 2 PRODUCTS.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **EMT Conduit (260533.C50)**.

1. EMT conduit may be used in all indoor and outdoor locations. In outdoor locations the fittings shall be watertight compression fittings. Set screw fittings shall be acceptable in indoor locations.
2. Conduit connectors shall have insulated throats, plastic bushings or ground bushing installed.
3. Fittings on EMT conduit shall be set screw type with insulated throat. Diecast fittings are not acceptable.

B. **Galvanized Sheet Metal Boxes (260553.B15).**

1. Shall comply with NEMA specifications for sheet metal boxes.
2. All boxes shall be hot dipped galvanized, concrete tight with interlocking ring
3. All boxes shall be deep, no shallow boxes shall be permitted.
4. Provide mud rings or industrial covers for the devices installed and a depth to match the sheetrock where applicable.
5. Minimum box size for receptacles shall be 4" square, 1-1/2" deep.
6. Minimum box size for signal system outlet shall be 4" square, 2-1/8" deep.
7. All boxes shall be one piece.
8. All device covers shall be one piece.
9. Shall be Hubbell or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General Requirements

1. Install conduit runs in accordance with the schematic representation shown on the Drawings.
2. Minimum conduit size shall be .75 inch unless specifically called out otherwise on the drawings.

3. Where raceways are indicated, but the routing is not identified, the routing shall be the CONTRACTOR'S choice and in accordance with the rest of the Contract Documents and the National Electrical Code (NEC).
4. Raceways shall be electrically and mechanically complete before the conductors are installed.
5. Routing of conduits may be adjusted to avoid obstructions. Coordinate with other trades prior to installation of raceways. Lack of such coordination shall not be justification for extra compensation and removal and reinstallation to resolve conflicts shall be at the CONTRACTOR's expense.
6. Conduit joints shall be wrench tight, thoroughly grounded, secure and free of obstructions.
7. Conduits shall be reamed.
8. Exposed conduits shall be installed parallel or perpendicular to the structural members and surfaces and shall be level and or plumb.
9. When two or more conduits are routed in the same general direction their routing shall be parallel with symmetrical bends.
10. Conduits shall be bent with equipment specifically designed for this purpose and for the specific size and type of conduit.
11. Conduits that are creased or crushed shall be replaced.
12. Install conduits such that they do not interfere with the proper and safe operation of equipment and do not block or otherwise interfere with the ingress and egress and installation of removable hatches and covers.
13. Install expansion joints as needed across expansion joints in the structure and at other locations where necessary to compensate for thermal or mechanical expansion or contraction.
14. Conduits shall be routed at least six (6) inches from high temperature piping, ducts and flues.
15. All conduits shall be capped throughout construction to prevent entrance of dirt, trash, water, etc.

B. Metallic Raceway (EMT) Installation

1. Metallic raceways (EMT) shall be used throughout this project as follows:

    a. EMT shall serve as the "homerun" between the panelboard of original and the first junction box within Normal Power wiring device and equipment 20-amp branch circuits. The use of HCF-MC type cable shall be permitted to "spider" out of the first junction box to the wiring devices within the respective branch circuit. All other Normal Power branch circuits shall utilize EMT conduit.
    b. EMT shall be used for all lighting branch circuits.

2. Underground feeder and branch circuit conduits are shown explicitly on the Drawings, and shall be the exception to the metallic conduit requirement.
3. All conduits which stub into accessible ceilings for low voltage systems shall be provided with a conduit bushing.

C. Boxes

1. Install boxes and enclosures in accordance with the schematic representation as indicated on the Drawings.
2. Boxes and enclosures shall be mounted level and plumb.
3. Boxes and enclosures shall not be altered, holes drilled, etc. in any way that may compromise the NEMA rating of the enclosure or box.
4. Boxes and enclosures shall be bonded to the equipment grounding conductor.
5. Provide a divider whenever a box contains conductors of different potentials that the code requires separation.

6. Surface mounted enclosures and boxes shall be spaced off the surface at least 1/4 inch in damp or wet locations.

END OF SECTION

SECTION 26 05 53

ELECTRICAL AND CONTROL IDENTIFICATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes.

1. The section includes requirements for identification of electrical, safety, fire alarm and related components and equipment.

1.2 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260519.C01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data.

1. Pursuant to Section 01300 Submittal Procedures.
2. The initial submittal shall contain all the products, samples and data base specified. An initial submittal that does not contain all the specified data shall be returned as incomplete.

C. SAMPLE

1. Provide a sample of each type and size of nameplate, label, tag and means of attachment specified for approval by the OWNER.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Device & Faceplate Identification Labels (260553.F01).**

1. Shall be BLACK letters on clear background.
2. 3/8” high block lettering.
3. Adhesive label.
4. Brother P-Touch or approved equal.

B. **Conductor and Cable Identification Sleeves (260553.T31)**.

1. The identification sleeves shall be properly sized for the cable or conductor.
2. Shall be adhesive style.
3. Sleeves shall be white with black machine generated characters.
4. Provide Brady wire and cable sleeves or approved equal.

C. **Conductor Color Coding (260553.C89).**

1. Conductors shall be colored as specified in the table below. The technical specification requirements for the conductors are specified elsewhere.

Conductor Color Coding

System	Conductor	Color
All Systems	Equipment Grounding	Green
IT / Data	Data Cable Sheath (outer cover)	Reference Division 27
120 Volt AC Control	Hot Leg	Red
	Neutral	White
	Discrete Input Line (hot leg) Side	Red
	Discrete Input Switch Leg	Red w/White Stripe
	Discrete Output Line (hot leg) Side	Red
	Discrete Output Switch Leg	Red w/Orange Stripe
120/240 Volt Single Phase	Hot Leg # 1	Black
	Hot Leg # 2	Red
	Neutral	White
120/208 Volt Three Phase	Phase A	Black
	Phase B	Red
	Phase C	Blue
	Neutral	White
120, 208, 277 Volt	Switch Legs	Pink
480 Volt Three Phase	Phase A	Brown
Wye or Delta Corner Tap	Phase B	Orange
	Phase C	Yellow
	Neutral	Gray

System	Conductor	Color
120/240 Delta Three Phase	Phase A	Brown
	Phase B	Orange
	Phase C	Yellow
	Neutral	Gray

PART 3 - EXECUTION

3.1 INSTALLATION

A. General.

1. Device and Faceplate Identification Labels.

a. Devices, faceplates, small electrical boxes 4 inches or less located indoors and similar equipment shall be identified utilizing flexible identification tape. Typically, the CONTRACTOR shall provide machine generated, white labels with black characters except as specified otherwise. Explanation is provided below on how various systems shall be identified. In many cases the information necessary to develop the unique identification labels will be provide on the Contract Drawings. The verbiage required for the identification shall be as identified on the Contract Drawings. The CONTRACTOR shall request the required verbiage from the ENGINEER should it not be available or clear based on the information provided on the Contract Drawings.
b. Power receptacles faceplates (cover plates) shall state the panel and circuit number. A typical label might read “PNL208-1-CKT 15”.
c. Light switches faceplate shall state the panel and circuit number(s). A typical label might read “PNL208-2-CKT 15&17”.
d. Interior emergency light fixtures shall have a unique 0.5 inch adhesive dot applied to facilitate tracking routine maintenance required for emergency lighting. The dots shall be red when they have an integral battery back-up.
e. Low Voltage Face plates will be labeled with non-removable, typed or machine-engraved. The label shall identify the Data Distribution Room, patch panel, and port number on the patch panel to which the horizontal cable terminates. Data outlet labels shall be installed into the recess label field on the faceplate. For ceiling heights of 15’ or less, the label must be of large enough font to be read from the ground.
f. Fire alarm notification devices will be labeled as follows.

1 Initiating Devices (Circuit ID – Device Number) (M##-##).
2 Notification Devices (Panel ID – NAC Circuit Number – Device Number) (P##-N##-##).
3 Junction and Pull Boxes: legibly write on the cover with indelible ink pen the circuits contained in each box. Covers for all boxes containing fire alarm circuits shall be painted red.

2. Conductor and Cable Identification Sleeves.

a. Provide adhesive, machine generated, white labels with black characters for all cables and conductors. Explanation is provided below on how various systems shall be identified. In many cases the information necessary to develop the unique identification labels will be provided on the Contract Drawings. The verbiage required for the identification shall be as identified on the Contract Drawings. The CONTRACTOR shall request the required verbiage from the ENGINEER should it not be available or clear based on the information provided on the Contract Drawings.
b. The labels shall be installed between 6 to 8 inches from the end. Conductors shall be labeled at all splices and points of termination.
c. Power conductors and cables, including the neutral and the ground conductors shall all be identified individually. The identification label will be developed as follows: The first set of characters will be the equipment code identifying the source of power “PNL208” followed by the circuit number “CKT 12”. For example, the label would read “PNL208-CKT 12”.

END OF SECTION

SECTION 26 05 83

WIRING CONNECTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes.

1. The section includes requirements for conductor termination methods.

1.2 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260519.C01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data.

1. Pursuant to Section 01300 Submittal Procedures.
2. Manufacturer’s data including materials of construction, weight, and related information for each item specified in PART 2 PRODUCTS.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Electrical Spring Connectors (Wire Nuts) (260583.W01).**

1. Provide properly sized 18awg – 8awg spring connector wire nuts for the size and number of conductors spliced.
2. Quick push-in wire connectors are prohibited.
3. Ideal, 3M, Thomas and Betts, or approved equal.

2.2 ACCESSORIES

A. **Electrical Tape (260583.T40)**.

1. General electrical tape shall be premium grade, all weather vinyl electrical sinsulating tape.
2. 3M - Scotch 33+, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General.

1. All splices, taps, and terminations shall be made in outlet, junction, or pull boxes. Wire to 8AWG shall be spliced using spring connector wire nuts. 6AWG and larger, use indent compression or split bolt connectors for all conductors. Splices 6AWG and larger shall be insulated to voltage rating of feeder or circuit. Splices shall not be permitted in automation input and output wiring.
2. All identification shall be in compliance with Section 260553 Electrical and Control Identification.
3. Care shall be taken when terminating conductors to avoid kinking, cutting or puncturing the jacket or allowing contamination by grease, oil, or water.
4. Care shall be taken when terminating conductors to properly support the conductors and to avoid undue pressure on the connector or utilization equipment.
5. Conductors shall be terminated by use of pressure type connectors wire nuts. Wrapping conductors around a screw type terminal is not acceptable.
6. Connectors shall be installed as per the manufacturer's directions.
7. Wire nuts shall be used on conductors #10QWG or less and only for splicing conductors at light fixtures or receptacles. No other splicing of conductors with wire nuts are permitted unless specifically identified on the Drawings.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes.

1. This Section includes the requirements for wiring devices such as receptacles, toggle switches and devices plates.

1.2 REFERENCES

A. The following is a list of Standards which may be references in the Section.

1. National Electrical Contractors Association (NECA): National Electrical Installation Standards (NEIS).
2. National Electrical Manufacturers Association (NEMA).
    a. WD1 – General Requirements for Wiring Devices.
    b. WD6 – Wiring Device Dimensional Requirements.
3. National Fire Protection Association (NFPA): 70.
4. Underwriters Laboratories, Inc. (UL): 1070.

1.3 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 262726.R01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data.

1. Pursuant to Section 01300 Submittal Procedures.
2. Manufacturer’s data including materials of construction, equipment weight, and related information for each item specified in PART 2 PRODUCTS.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Tamper Resistant Receptacles (262726.R15).**

1. Shall be tamper-resistant, two-pole, three wire grounding type with screw type terminals suitable for number 10 American Wire Gauge (AWG).
2. Shall be NEMA 5-20R, rated for 20 amperes, 125 volt configuration.
3. Provide duplex or single receptacles as shown on the Drawings.
4. Shall be gray in color.
5. Provide Hubbell BG20 tamper resistant receptacles, or approved equal.

B. **Ground Fault Circuit Interrupter Receptacles (262726.R10).**

1. Shall be specification grade,feed-through, two-pole, three wire grounding type with screw type terminals suitable for number 10 American Wire Gauge (AWG).
2. Shall be NEMA 5-20R, rated for 20 amperes, 125 volt configuration.
3. Provide duplex receptacles as shown on the Drawings.
4. Shall be gray in color.
5. Provide Hubbell GFG8300S or approved equal.

C. **General Purpose Toggle Switches (262726.S01).**

1. Shall be heavy duty specification grade with grounding screw, 20 amperes, 120-277 volt rated with screw type terminals suitable for number 10 American Wire Gauge (AWG).
2. Single or double throw, single pole, three-way or four-way as shown on the Drawings.
3. Shall be gray in color.
4. Provide Hubbell CSB120 Specification Grade Commercial Series or approved equal.

D. **Stainless Steel Device Plates (262726.P01).**

1. Install stainless steel device plates where called out on the drawings.
2. Provide Hubbell smooth metal 302/304 super stainless steel or approved equal.

E. **Device Plate Identification Label (262726.D01).**

1. Label all device plates with a vinyl, super adhesive label rated for outdoor use and that is white, 0.375 inches high with 0.25 inch black characters.
2. Provide Brothers product or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General.

1. All identification labeling shall be in compliance with Section 260553 Electrical and Control Identification.
2. Devices shall be bonded to their enclosure and the equipment grounding conductor with a separate grounding conductor attached to the device which will allow the device to be detached from the enclosure without disconnecting the equipment grounding conductor from the enclosure.
3. The use of the mounting yoke as the only method for bonding is unacceptable.

4. Devices that are not installed at the end of the line (circuit) shall be pig-tailed out and the pig-tails shall be connected to the line and load conductors.
5. After the pigtailed conductors are terminated on the device and before it is installed in the enclosure the exposed energized parts shall be wrapped with electrical insulating tape with a minimum of three wraps.
6. As the device is installed in the enclosure, care shall be taken to neatly fold the conductors inside the enclosure so as to not kink, bind or otherwise damage the sheath of the conductors.
7. Terminations on all devices shall be via pressure or compression type connectors. Wrapping conductors around a termination screw and tightening is unacceptable.
8. Mounting heights for receptacles shall be 18 inches to center from finished floor unless called out otherwise on the Drawings or specified at different height to meet minimum code requirements. Where countertops are present, receptacles shall be mounted horizontally and mounted 4 inches to center above the back-splash. The CONTRACTOR is responsible to coordinate with the approved casework submittals. Failure to do so will require the CONTRACTOR to relocate devices at their expense.
9. Mounting height for switches shall be 46 inches to center above finished grade unless called out otherwise on the Drawings or specified at different height to meet minimum code requirements. Where countertops are present, switches shall be mounted 5 inches to center above the back-splash. The CONTRACTOR is responsible to coordinate with the approved casework submittals. Failure to do so will require the CONTRACTOR to relocate devices at their expense.
10. Coordination is the responsibility of the CONTRACTOR. If a conflict exists for the mounting location of devices, the CONTRACTOR shall bring it to the ENGINEER's attention during the rough-in phase and the ENGINEER shall provide direction. Failure to coordinate conflicts during the rough-in phase will result in relocation of devices at the CONTRACTOR's expense.
11. Devices shall be installed level and plumb. Devices shall be brought out plumb with the wall surface via UL listed spacers approved for this purpose if necessary.
12. Devices shall be tested for voltage, polarity, ground integrity and in the case of GFCI receptacles, that they operate as intended.
13. The position of devices, as shown on the Drawings, are general locations only unless dimensioned. The CONTRACTOR is responsible to coordinate with various trades to ensure no conflict exists.

END OF SECTION

SECTION 26 51 00

INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes.

1. This Section includes the requirements for the interior illumination fixtures and controls.

1.2 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 265100.I01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data.

1. Pursuant to Section 013300 Submittal Procedures.
2. Manufacturer’s data including materials of construction, fixture dimensions, options provided and related information for each item specified in PART 2 PRODUCTS.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements.

1. All products shall be UL listed for the environment they are installed in.

PART 2 - PRODUCTS

2.1 FIXTURES

A. Reference the Luminaire Schedule for all Interior Luminaires.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General.

1. All identification labeling shall be in compliance with Section 260553 Electrical and Control Identification.
2. CONTRACTOR shall provide all mounting hardware required to mount luminaires in lay-in or gypsum board ceilings. Verify ceiling types with the ARCHITECT. Luminaires of a given type may be used in more than one type of ceiling.
3. Luminaires shall be supported by #12 AWG hanger wire connected to the luminaire and the building structure.
4. Positively attach all luminaires to the suspended ceiling system. Attachment devices shall have capacity of 100% of the luminaire weight acting in any direction.
5. Verify luminaire locations with the ARCHITECT'S reflected ceiling plan.
6. Adjustable luminaire heads shall be aimed as directed by the ENGINEER.
7. All luminaires shall be cleaned of all dirt, dust, and finger prints prior to close-out.

END OF SECTION

SECTION 26 56 00

EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes.

1. This Section includes the requirements for exterior illumination fixtures and control.

1.2 SUBMITTAL

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 265600.E01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data.

1. Pursuant to Section 013300 Submittal Procedures.
2. Manufacturer’s data including materials of construction, fixture dimensions, options provided and related information for each item specified in PART 2 PRODUCTS.

1.3 QUALITY ASSURANCE

A. Regulatory requirements.

1. Products provided shall be UL listed for the environment in which they are installed.

PART 2 - PRODUCTS

2.1 LUMINAIRES

A. Shall be as shown on the Luminaire Schedule.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General.

1. All identification labeling shall be in compliance with Section 260553 Electrical and Control Identification.
2. Fixtures mounted above doors shall be centered unless specifically called out otherwise on the Drawings.
3. Fixtures mounted on the exterior of split face block shall be fed with a conduit entering the back of the fixture routed from the interior of the building. Mounting the fixture on a box is unacceptable.
4. Use stainless steel mounting hardware.
5. Mount at the height shown on the Drawings.
6. Fixtures mounted on the building shall have a photo electric control with a manual toggle switch override unless shown differently on the drawings.

END OF SECTION

SECTION 27 00 00

GENERAL COMMUNICATION SYSTEM REQUIREMENTS

PART 1 - GENERAL

SECTION INCLUDES

A. Section Includes

1. General communications system requirements.

REFRENCES

2. The following is a list of Standards that may be referenced in the Section.
3. American National Standards Institute (ANSI)

    a. ANSI-J-STD 607, Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

4. Building Industries Consulting Services International (BICSI)
5. Electronics Industries Alliance (EIA)
6. International Building Code (IBC)
7. Institute of Electrical and Electronics Engineers (IEEE)

    a. Std. 110, Recommended Practice for Powering Grounding Sensitive Equipment

8. National Fire Protection Association (NFPA)

    a. 70, National Electrical Code
    b. 75, Protection of Electronic Computer and Data Processing Equipment

9. Telecommunication Industry Standard (TIA)

    a. TIA/EIA 455-A , Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connection and Terminating Devices, and Other Fiber Optic Components
    b. ANSI/TIA/EIA 568-B, Commercial Building Telecommunications Cabling Standard
    c. ANSI/TIA/EIA 569-B, Commercial Building Standard for Telecommunications Pathways and Spaces
    d. ANSI/TIA/EIA 606, Administration Standard for Commercial Telecommunications Infrastructure
    e. TIA/EIA 758 , Customer-Outside Plant Telecommunications Cabling Standard

PERMITS, FEES AND SERVICE CHARGES

B. The CONTRACTOR shall obtain all electrical permits required to complete the work and pay all associated fees.

CONTRACTORS RESPONSIBILITY FOR FIELD VERIFICATION OF EXISTING CONDITIONS

C. The CONTRACTOR shall be responsible for performing field verification of the existing conditions prior to bidding. Then nature of this work inherently requires field observation to understand the existing conditions and scope of work.

D. Failure to observe the existing conditions or ignorance of existing conditions shall be the responsibility of the CONTRACTOR alone. Additional services may not be authorized due to the CONTRACTOR'S lack of understanding of the existing conditions.

CONTRACTOR'S RESPONSIBILTY FOR SHUTDOWNS AND MAINTAINING EXISTING SYSTEMS

E. Shutdowns of any Division 26, 27, 28 system shall be coordinated with the OWNER prior to performing the shutdown. The CONTRACTOR shall provide the OWNER with a written schedule identifying the system, duration, and impact on the OWNER'S facility.

F. Existing Division 26, 27, 28 systems not impacted by the work in this project shall be protected and maintained during construction. Any system not identified on the Drawings or within these Specifications shall be brought immediately to the attention of the ENGINEER and OWNER.

1. The CONTREACTOR shall be responsible for bearing the cost of repairing or restoring all electrical systems that are disrupted or damaged during construction. The system shall be repaired and restored to their original condition.

The CONTRACTOR shall coordinate and provide for the installation and operation of franchise utility service (including any telephone and/or leased lines specified) as required during construction, startup, testing, and operation of the work until substantial completion.

INTENT OF DRAWINGS AND SPECIFICATIONS

G. Riser and other diagrams are schematic and are intended to show the approximate location of equipment, and the general alignment of conduits and piping, and shall not be used for obtaining quantities. Dimensions given on the plans shall take precedence over scaled dimensions and all dimensions whether in figures or scaled, shall be verified in the field.

H. The electrical drawings do not show complete details of the site conditions. The CONTRACTOR shall check actual conditions.

I. The exact location of apparatus, fixtures, equipment, conduit and piping shall be ascertained by the CONTRACTOR in the field, and the work shall be laid out accordingly. Should the CONTRACTOR fail to ascertain such locations or coordinate with work performed by other trades, the work shall be changed at no additional cost to the OWNER when so ordered by the ENGINEER. The ENGINEER reserves the right to make minor changes in the location of conduit, piping and equipment up to the time of installation without additional cost to OWNER.

J. CONTRACTOR shall provide all labor, materials, equipment, machinery, and tools necessary to provide all electrical equipment specified and shown on the Drawings. All items not specified in detail or shown on the Drawings but necessary for complete installation shall be provided by the CONTRACTOR.

DESIGN / BUILD REQUIREMENTS

K. The CONTRACTOR shall be responsible for providing all boxes and raceways for the low voltage communication.

L. The low voltage contractor shall provide the following on this project:

1. Low voltage horizontal cabling, j-hooks, cable straps, cable supports, terminations, labeling, and testing.
2. Low voltage outlet faceplates, jacks, connectors, and labeling

M. The CONTRACTOR shall provide the following:

1. All hardware, supports, boxes, mudrings, conduits, and conduit bushings for the low voltage systems.
2. Installation shall comply with 260529 Hangers & Supports and 260533 Raceways and Boxes for Electrical Systems.
3. Communications systems grounding.

SUBMITTALS

N. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 270000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

O. Deferred Submittals

1. Submittals for seismic bracing and anchoring shall be a deferred submittals. Engineering of the seismic bracing and anchoring system shall be provided by a licensed Engineer in the State of Oregon. Submittals shall include calculations and drawings, including connection types/materials/sizes, load, maximum load, dimensions, etc.

P. The CONTRACTOR shall indicate on the submittals all variances from the Specifications.

Q. Record Drawings. After the completion of construction, the CONTRACTOR shall provide one set of “as-built” drawings to the ENGINEER as specified herein showing all changes or deviations from the original drawings.

R. Final inspection certificates shall be submitted prior to final payment.

COORDINATION OF WORK

S. The CONTRACTOR shall plan his work in coordination with the other trades and with the power and telephone utility authorities.

T. The CONTRACTOR shall field verify all dimensions of equipment to be installed or provided by others so that correct clearances and connections may be made between the work installed by the CONTRACTOR and equipment installed or provided by others.

U. The CONTRACTOR shall arrange all conduit runs so that they do not interfere with piping, structural members, etc.

V. All working measurements shall be taken from the sites, checked with those shown on the drawings, and if they conflict, reported to the ENGINEER at once, and before proceeding with

the work. Should the CONTRACTOR fail to comply with this procedure, he shall alter his work at his own expense as directed by the ENGINEER.

W. No additional payments will be allowed where obstructions in the work of other trades, or work under this contract requires offsets to conduit runs.

X. The CONTRACTOR is responsible for all alterations in the work to accommodate equipment differing in dimensions or other characteristics from that shown or specified.

Y. The CONTRACTOR shall provide all temporary power necessary for existing site equipment and for all construction needs.

SUPERVISION

Z. The CONTRACTOR shall maintain adequate supervision of the work and shall have a responsible person in charge at the site during all times that work under this contract is in progress, or when necessary for coordination with other work.

CODES

AA. Work shall conform to the National Electrical Code (NEC), and State Codes and other applicable codes, even though not specifically mentioned for each item. These shall be regarded as the minimum standard of quality for materials and workmanship.

CONTRACTOR'S RECORD DRAWINGS & AS-BUILTS

BB. The CONTRACTOR shall maintain a neatly marked set of record drawings showing the locations of all buried conduits and other utilities encountered or installed during construction. The final locations of equipment racks, panels, field mounted instruments and panels, terminal boxes, junction boxes, cable trays, wiring devices and other materials included in the work shall be shown, as well as conduit routing between them to the extent it differs from the design drawings. Record drawings shall be kept current with the work as it progresses and shall be subject to inspection by the OWNER's Representative at any time. Failure to keep field record drawings current may result in the issuance of a stop work order or delay in the processing of pay requests until the record drawings are made current.

CC. The CONTRACTOR shall provide one complete set of as-built electrical schematics for all patch panels and equipment provided, including horizontal cabling schematics as applicable, panel elementary diagrams, interconnecting wiring diagrams, wire numbers, termination strip locations and numbers. These shall be in the same format and style as those in the Contract Documents and submittal requirements.

DD. All information shown on the CONTRACTOR's field record drawings and as-built schematics shall be subject to verification by the OWNER's Representative. If significant errors or deviations are noted by the OWNER's Representative, new as-builts shall be completed at the CONTRACTOR's expense.

PART 2 - PRODUCTS

NEW PRODUCTS

A. All products shall be new without defects and covered by Manufacturer's warranty. Products shall be re-used only where indicated on the Drawings.

B. All products shall be listed, labeled, and certified by a testing agency approved by the state of Oregon.

C. All equipment of the same type and capacity shall be by the same manufacturer.

PART 3 - EXECUTION

IDENTIFICATION

A. All identification labeling shall be in compliance with the OWNER'S labeling standards.

WORKMANSHIP & COORDINATION

B. All work shall be performed by personnel skilled in the particular trade in a workmanlike manner. Workmanship shall conform to the standards of the NEC and the National Electrical Installation Standards (NEIS).

C. The ENGINEER shall be the sole judge as to whether or not the finished work is satisfactory; and if in his judgment any material or equipment has not been properly installed or finished, the CONTRACTOR shall replace the material or equipment whenever required, and reinstall it in a manner entirely satisfactory to the ENGINEER without any increase in cost to the OWNER.

D. The CONTRACTOR shall coordinate and verify the installation of all equipment furnished by him to other trades, or equipment provided and installed by other trades that is connected to the electrical or control systems. Work shall include the furnishing of all labor, materials, and equipment required for the installation of a complete and operable system as hereinafter specified and as indicated on the drawings. The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. Unless otherwise specifically stipulated, the term "furnished and installed complete" shall be considered a part of this section.

SUPPORT BACKING

E. Provide any necessary backing required to properly support all fixtures and equipment installed under this contract.

CUTTING, PATCHING AND FRAMING

F. The CONTRACTOR shall determine in advance the locations and sizes of all sleeves, chases, and openings necessary for the proper installation of his work.

G. Whenever practical, inserts or sleeves shall be installed prior to covering work. Cutting and patching shall be held to a minimum. All required holes in concrete construction shall be made with a core drill and patched with non-metallic non-shrink grout.

H. Cutting, fitting repairing and finishing of carpentry work, metal work, or concrete work, and the like, which may be required for this work shall be done by craftsmen skilled in their respective trades. When cutting is required, it shall be done in such a manner as not to weaken walls, partitions, or floors; and holes required to be cut in floors must be drilled without breaking out around the holes.

CLEANING AND TOUCH-UP PAINT

I. Upon completion of work, all electrical equipment shall be cleaned.

1. Vacuum all dirt, metal shavings, and foreign materials from all enclosures. The use of compressed air shall not be acceptable.
2. All stains, dirt, and fingerprints shall be removed from enclosures, and all other electrical and communications equipment covers.

J. Provide touch-up paint on equipment that has been scraped, scratched, or chipped during construction. Paint color shall match color of equipment.

END OF SECTION

SECTION 27 15 00

COMMUNICATIONS HORIZONTAL CABLING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes.

1. The section includes requirements for communication horizontal cabling.

1.2 SUBMITTALS

A. Contractor shall submit all the product data in Division 27 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 271500.G01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data
1. Pursuant to Section 01300 Submittal Procedures.
2. Manufacturer's data including materials of construction, methods of installation and related information for each item specified in PART 2 PRODUCTS.

PART 2 PRODUCTS

2.1 MATERIALS

A. **CAT6 Horizontal Cabling Plenum Rated (271500.C97).**
1. Shall be unshielded twisted (UTP) copper conductors, Category 6, four-pair.
2. Shall be plenum rated.
3. Indoor rated.
4. Shall be certified by the Manufacturer to transport 1,000 Mb/s.
5. Conductors shall be 24 AWG solid bare copper.
6. Color shall be blue.
7. Provide Berk-Tek LANmark-6 Cat 6 Series, Owners Standard.

B. **RJ45 Jacks (271500.J45)**
1. Jacks shall be keystone design.
2. One jack shall be ivory in color, one jack shall be orange in color.
3. Shall be CAT6 compliant.
4. Jacks shall be Hubbell HXJ6 Series, Panduit, or approved equal.

C. **Low Voltage Device Plates (271500.W01)**
1. Shall be single gang.
2. Shall accept keystone connections.
3. Shall have two ports, and two identification windows.
4. Shall be provided with blank covers for all unused ports.
5. Shall be stainless steel.
6. Shall be Hubbell or approved equal.

PART 3 INSTALLATION

3.1 General.

A. All identification labeling shall be in compliance with Section 260553 Electrical and Control Identification.

B. Cable shall not be secured to ceiling hanger wire.

C. Cable installation shall maintain the following clearances:
1. Power conduits - 12 inches.
2. Luminaires - 12 inches.
3. Mechanical equipment - 48 inches.

3.2 Testing

A. All existing cables which are re-terminated on this project shall be tested.

B. The permanent link shall be tested.

C. All test results shall be used by the CONTRACTOR to determine any polarity and noise anomalies and CONTRACTOR shall take immediate corrective action for all anomalies.

D. Test results shall be used by the CONTRACTOR and the Authorized Representative to determine the viability of each sheath for transmission in accordance with the specifications of the cable manufacturer and the requirements imposed by the transmission system. This shall form part of the acceptance procedure for the cable plant. All results obtained by use of pair-scanner testing shall be collated by terminal outlet number and or riser pair number and presented to the Authorized Representative at the conclusion of the testing. Test compilation shall be initialed and dated by the CONTRACTOR's technician performing the test.

E. The CONTRACTOR shall utilize a level-III Fluke, PentaScanner, Wavetek or equal, twisted pair test instrument for the testing of all System Category 6 copper cabling. All Category 6 cable paths shall be tested at each jack for the following parameters and meet the requirements imposed by the TIA/EIA 568-B3 building wiring standard, ANSI/TIA-568-C.4 Broadband Coaxial Cabling and Components Standard, and the manufacturer's written specification.

F. At project close-out, provide a complete cable certification report covering all locations.

END OF SECTION

SECTION 27 51 13

PAGING AND CLOCK SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes.

1. This Section includes the requirements for paging and clock systems.

1.2 SUBMITTALS

A. Contractor shall submit all the product data in Division 27 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 275113.G01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data.

1. Pursuant to Section 01300 Submittal Procedures.
2. Manufacturer’s data including materials of construction, equipment weight, and related information for each item specified in PART 2 PRODUCTS.

C. Contractor Qualifications

1. The Contractor shall be an authorized dealer of the Manufacturer with full warranty privileges.
2. Minimum five years documented experience in the Portland Metro area and with service facilities within 100 miles of Project. Staff includes at least one factory-trained technician certified by manufacturer of this equipment.

D. Contractor Design Build Responsibilities

1. The CONTRACTOR shall be responsible for providing a design/build of the paging system. The CONTRACTOR shall provide the following:

a. Horizontal cabling design shall be the responsibility of the CONTRACTOR. The final quantities of cabling and routing shall be the responsibility of the CONTRACTOR. The Drawings do not show this information.
b. Final paging hardware quantities shall be the responsibility of the CONTRACTOR. All hardware, cards, amplifiers, power supplies, etc necessary for a complete and

working system shall be the responsibility of the CONTRACTOR. The Drawings do not show this information.

c. Product data and technical literature on all devices, components, hardware, and wiring used for the paging system.
d. Self-amplified speaker and horn power supply calculations and power supply sizing, quantity, and installation.
e. Scaled floor plans, showing all paging system devices, equipment, circuits, and homeruns.
f. Horizontal cabling design and circuiting.
g. Demonstration, training, and commissioning.

2. Intent of the Drawings and Specifications

a. The paging system drawings are schematic and are intended to show the approximate location of devices and equipment as well as the general alignment of conduits and piping.
b. CONTRACTOR shall provide all labor, materials, equipment, machinery, and tolls necessary to provide all electrical equipment specified and shown on the Drawings. All items not specified in detail or shown on the Drawings but necessary for complete installation shall be provided by the CONTRACTOR.

3. Warranty

a. Provide guarantee of installed system against defects in material and workmanship, including cost of corrective labor and materials at no expense to the BSD Representative, for duration of one year from date of acceptance by the BSD Representative.

PART 2 - PRODUCTS

2.1 MATERIALS – PAGING SYSTEM

A. OWNER standard is Rauland, no equal**.**
B. **Horizontal Cabling (275113.C02).**

1. Furnish and install all cable as recommended by the manufacturer. Size wiring to match line length. Route each speaker to the MDF and terminate on a 66 split block.
2. Cable shall be plenum rated.

C. **Analog Wall Mounted Speaker (275113.S02).**

1. Shall be one-way.
2. Shall be recessed, 8” diameter.
3. Shall be stainless steel face plate, color shall be white.
4. Shall be dual cone design with a frequency response of 70Hz – 15kHz.
5. Shall be 1” diameter voice coil with 10 oz. magnet. Sensitivity of at least 96dB measured at 1w, 1m.

2.2 ACCESSORIES

A. **Boxes (275113.B01)**.

1. Provide all manufacturer supplied boxes for all ceiling and wall speakers.

2.3 MATERIALS – CLOCK SYSTEM

A. **Single Sided Clock (275113.C03).**

1. Shall be 12” diameter GPS transmitter clock.
2. Shall be 72MHz local transmitter with external antenna.
3. Shall be battery operated.
4. Shall be OWNER Standard, Primex #14000-E, no equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General.

1. All identification labeling shall be in compliance with Section 260553 Electrical and Control Identification.
2. All products and cabling shall be installed per the Manufacturer’s requirements.
3. All analog speakers shall be individually connected (home run) and terminate on a 66 split block at the same location as the telephone bridge. Bridging clips will be used to connect paging equipment to individual speaker lines. No other connection method will be approved.
4. Position all clocks in locations with distribution to minimize the need for additional repeaters.
5. Perform initial and final programming of the system and audio adjustments. Final audio adjustments shall be performed to the satisfaction of the OWNER.
6. The position of devices, as shown on the Drawings, are general locations only unless dimensioned. The CONTRACTOR is responsible to coordinate with various trades to ensure no conflict exists.

B. Demonstration and Commissioning

1. Final commissioning shall be performed by a manufacturer certified technician.
2. Demonstration shall be performed in the presence of the ENGINEER and the OWNER. Two (2) weeks notification minimum will be provided prior to the witness testing.
3. Prior to demonstration of the system to the ENGINEER and OWNER, the CONTRACTOR shall perform independent testing of the system to ensure compliance. Deficiencies shall be corrected prior to demonstration to the ENGINEER and OWNER.
4. As-built drawings shall be provided to the Engineer and Owner in electronic (AutoCAD) and PDF format

END OF SECTION

SECTION 28 30 00

FIRE DETECTION AND ALARM

PART 1 - GENERAL

SUMMARY

A. Section Includes.

1. The section includes requirements for fire alarm detection and alarm.

REFERENCES

B. The following is a list of standards which may be referenced in this Section.

1. National Fire Protection Association (NFPA)

   a. NFPA 13 – Sprinkler Systems.
   b. NFPA 70 – National Electrical Code.
   c. NFPA 72 – National Fire Alarm Signaling Code
   d. NFPA 101 – Life Safety Code

2. International Fire Code – 2009 Version:
3. Underwriters Laboratories (UL):

   a. UL 268 - Smoke Detectors for Fire Alarm Signaling Systems
   b. UL 497 B – Protectors for Data Communications and Fire Alarm Circuits
   c. UL 864 - Control Units and Accessories for Fire Alarm Systems
   d. UL 1424 – Cables for Power-Limited Fire Alarm Circuit
   e. UL 1971 - Signaling Devices for the Hearing Impaired

SUBMITTALS

4. None required.

PERMITTING AND SUBMITTALS TO THE AUTHORITY HAVING JURISDICTION (AHJ)

C. Permitting, permitting drawings, and associated submittals shall be provided by the low voltage contractor.

D. A copy of the Product Data and Quality Assurance/Control Submittals shall be provided to the AHJ. In addition, a copy of the Contract Documents shall be included. The Contractor shall make clarifications or revisions as directed by the AHJ. All comments received from the AHJ shall be submitted immediately to the Engineer for review.

DESIGN BUILD REQUIREMENTS

E. The CONTRACTOR shall be responsible for providing all boxes and raceways for the fire alarm system. The fire alarm system will be provided by the low voltage contractor.

F. The final location of all fire alarm devices shall be determined by the approved permitting drawings. The CONTRACTOR shall be responsible for coordinating final device quantities and locations with the approved permitting set.

G. The CONTRACTOR shall be an authorized representative and installer of Simplex Fire Alarm Systems.

H. The low voltage contractor shall provide the following:

1. Permitting drawings, submittals to AHJ, and permit
2. Fire alarm control panel
3. Remote annunciator
4. All fire alarm devices, wiring, and terminations.
5. Device labeling
6. Testing and commissioning

PART 2 - PRODUCTS

MATERIALS

A. General

1. OWNER'S standard manufacturer is Simplex. All devices shall be from this manufacturer, no substitutions allowed.

B. Horn Strobe (2833000.H02)

1. Shall be UL 1971listed.
2. Wall or ceiling mount style.
3. Suitable for indoor and outdoor installations.
4. Strobes shall match specifications for visual strobes.
5. Color shall be red.
6. Shall be compatible with existing fire alarm system.

C. Smoke Detector (28300.S01)

1. Smoke detectors shall be photoelectric type.
2. Smoke detectors shall be addressable.
3. Smoke detectors shall be two-wire style.
4. Shall be constantly monitored for changes in sensitivity due to dirt, humidity, and temperature.
5. Shall provide advance notice to the FACP when requiring maintenance.
6. Color shall be red.
7. Shall be compatible with existing fire alarm system.

D. Boxes (283000.B01).

1. Shall be comply with 260533 Raceways & Boxes.
2. Color shall be RED.
3. Shall be provided for all fire alarm devices shown on the Drawings.
4. Sizes of boxes for fire alarm devices and annunciators shall be the responsibility of the CONTRACTOR and shall be coordinated with the OWNER's low voltage contractor.
5. Mudrings, if required, shall be provided by the CONTRACTOR and coordinated with the OWNER's low voltage contractor

E. EMT Conduit (283000.C01).

1. Shall comply with 260533 Raceways & Boxes.
2. Shall be installed between fire alarm device in walls and stubbed into accessible ceilings.
3. Shall be provided in all exposed applications, such as fire sprinkler rooms, elevator machine rooms, elevator pits, electrical rooms, etc.
4. Bushings shall be provided.
5. Shall be 3/4" trade size minimum.

F. **Notification Appliance Circuit Conductors (283000.N10).**

1. Notification Appliance Circuit (NAC) Conductors shall be copper, un-twisted, unshielded. Conductor color shall be red (+) and black (-).
2. NAC Conductor material shall be stranded copper.
3. NAC Conductors shall be plenum rated.
4. NAC Conductor size shall be 14/2 AWG.
5. NAC Conductor insulation shall be PVC.
6. NAC Conductor jacket cover shall be PVC. Jacket color shall be red and black.
7. NAC Conductors shall be Southwire FPLP and FPLR, or approved equal.

G. **Signaling Line Circuit Conductors (283000.S02).**

1. Signaling Line Circuit (SLC) Conductors shall be copper, twisted unshielded pair. Conductor color shall be red (+) and black (-).
2. SLC Conductor material shall be stranded copper.
3. SLC Conductors shall be plenum rated.
4. SLC Conductor size shall be 16/2 AWG.
5. SLC Conductor insulation shall be PVC.
6. SLC Conductor jacket cover shall be PVC. Jacket color shall be red and black.
7. SLC Conductors shall be Southwire FPLP and FPLR, or approved equal.

PART 3 - EXECUTION

INSTALLATION

A. General.

1. The CONTRACTOR shall coordinate the installation of the 120 VAC power with the Fire Alarm installer. Care shall be taken to ensure that the 120 VAC branch circuit conduit is installed according to the Manufacturer's requirements and the NEC. The 120 VAC branch circuit conductors shall be installed within the FACP such that Code required separation is maintained between Class 1 conductors and the power limited conductors. Installing Class 1 conductors across power limited conductors or over the batteries shall not be acceptable.
2. All Fire Alarm System junction boxes shall be red.
3. Coordination is the responsibility of the CONTRACTOR. If a conflict exists for the mounting location of devices, the CONTRACTOR shall bring it to the ENGINEER’s attention during the rough-in phase and the ENGINEER shall provide direction. Failure to coordinate conflicts during the rough-in phase will result in relocation of devices at the CONTRACTOR’s expense.
4. Devices shall be installed level and plumb. Devices shall be brought out plumb with the wall surface via UL listed spacers approved for this purpose if necessary.
5. The position of devices, as shown on the Drawings, are general locations only unless dimensioned. The CONTRACTOR is responsible to coordinate with various trades to ensure no conflict exists.
6. All testing and demonstration shall be performed to the satisfaction of the AHJ and the Fire Marshal.

END OF SECTION

SECTION 28 31 00

INTRUSION DETECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes.

1. This Section includes the requirements for Intrusion Systems.

1.2 SUBMITTALS

A. Contractor shall submit all the product data in Division 27 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 283100.G01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

B. Product Data.

1. Pursuant to Section 01300 Submittal Procedures.
2. Manufacturer’s data including materials of construction, equipment weight, and related information for each item specified in PART 2 PRODUCTS.

C. Contractor Qualifications

1. The Contractor shall be an authorized dealer of the Manufacturer with full warranty privileges.
2. Minimum five years documented experience in the Portland Metro area and with service facilities within 100 miles of Project. Staff includes at least one factory-trained technician certified by manufacturer of this equipment.

D. Contractor Design Build Responsibilities

1. The CONTRACTOR shall be responsible for providing a design/build of the intrusion system. The contract documents show the general nature of the intrusion system. The CONTRACTOR shall provide all intrusion devices required for a complete system to the satisfaction of the OWNER.
2. The CONTRACTOR shall provide a complete working system.

a. The CONTRACTOR is responsible for all parts of the installation including, but not limited to the following.

1) Raceways
2) Boxes
3) Hangers and supports
4) Conductors and cables
5) Wiring and cabling
6) System components, devices, and hardware as required.
7) Terminations, set-up, and programming.
8) Commissioning.
9) Start-up and testing.
10) Demonstration.

3. The following tasks shall be the responsibility of the CONTRACTOR, and have been delegated as a design/build delivery method:

   a. Developing project specific installation wiring diagrams. Diagrams shall include all conductor sizes and quantities, terminal strip and numbers, and project specific hardware. Generic wiring diagrams shall not be acceptable.
   b. Conductor voltage drop calculations and conductor sizing.
   c. The CONTRACTOR shall submit the diagrams and calculations to the ENGINEER for review and approval.

4. Warranty

   a. Provide guarantee of installed system against defects in material and workmanship, including cost of corrective labor and materials at no expense to the BSD Representative, for duration of three years from date of acceptance by the BSD Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Wall Mounted Motion Detector (283100.D66).**

1. Shall have functional device lighting/alert features activated.
2. Shall be labeled with a number which can be read when standing at ground level.
3. Number shall match that on the point map and on the as-built drawings.
4. Shall be Bosch, model D1260 or most current model.

B. **Door Contact (283100.C66).**

1. Shall meet both intrusion and access control operation.
2. Shall be DPDT.
3. Shall be Inerlogix UTC 1078/1076 series.

2.2 ACCESSORIES

A. **Intrusion Detection Cables (283100.C55)**.

1. CONTRACTOR shall provide cables with copper conductors in the AWG and count recommended by the manufacturer and for the environment installed.
2. Cables shall be plenum rated.
3. Provide cables manufactured by Belden, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General.

1. The CONTRACTOR shall coordinate the final locations, mounting heights, and requirements with the ARCHITECT prior to installation.
2. The CONTRACTOR shall coordinate all cabling requirements with the System Supplier prior to installation. The System Supplier shall approve all cable types before ordering.
3. All identification labeling shall be in compliance with Section 260553 Electrical and Control Identification.
4. All products and cabling shall be installed per the Manufacturer's requirements.
5. All wiring and installation shall meet Division 26 and 27 standards for electrical and communication.
6. Cables shall be installed parallel and perpendicular to the structural elements of the building. Line of sight "spider webs" shall not be permitted.
7. Cables installed above accessible ceilings shall not block access to access panels, mechanical equipment, piping valves, electrical equipment, or other equipment requiring access for maintenance and service
8. The position of devices, as shown on the Drawings, are general locations only unless dimensioned. The CONTRACTOR is responsible to coordinate with various trades to ensure no conflict exists.

B. Demonstration and Commissioning

1. Final commissioning shall be performed by a manufacturer certified technician.
2. Demonstration shall be performed in the presence of the ENGINEER and the OWNER. Two (2) weeks notification minimum will be provided prior to the witness testing.
3. Prior to demonstration of the system to the ENGINEER and OWNER, the CONTRACTOR shall perform independent testing of the system to ensure compliance. Deficiencies shall be corrected prior to demonstration to the ENGINEER and OWNER.
4. As-built drawings shall be provided to the Engineer and Owner in electronic (AutoCAD) and PDF format

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE COURSE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Aggregate Base Course Material.
2. Aggregate Base Course Placement

1.2 SUBMITTALS

A. Submittals for Review:
1. Product Data including gradation, R-value, sand equivalent, and durability.
2. Test Reports: Submit plant and field test reports

PART 2 PRODUCTS

2.1 MATERIALS

A. Aggregate
1. Meet the requirements of Oregon Department of Transportation Standard Construction Specifications, Section 02630 – Base Aggregate.
2. Aggregate shall be ¾”-0 crushed rock.

PART 3 EXECUTION

3.1 INSTALLATION

A. Place aggregate in lifts not exceeding 6” in compacted thickness.

B. Compact each lift to not less than 95% compaction.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Placing of base course.
B. Placing of asphalt concrete.
C. Sealant.
D. Field Quality Control.
E. Maintenance of pavement.

1.2 SUMMARY

A. Related Sections:
   1. Section 01 4500: Quality Control, for special inspection and independent testing requirements.
   2. Aggregate base course for asphalt paving is specified in Section 32 11 23 - Aggregate Base Course.
   3. Cast-in-Place Concrete in Section 03 30 00.

1.3 SUBMITTALS

A. General: Refer to Section 01 33 00 - Submittal Procedures, for submittal requirements and procedures.

B. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

C. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

D. Material certificates.

1.4 PROTECTION

A. Protect concrete pavements and walks, curbs and bases, and other improvements adjacent to the operations with suitable materials. The Contractor shall be responsible for any damage caused by the Contractor's employees or equipment and shall make necessary repairs. Buildings and other surfaces shall be covered with paper or other protection, where required. All damage caused by the Contractor's operations shall be repaired or replaced as required.

1.5 QUALITY CONTROL

A. Quality Assurance: Comply with ACI301, "Specification for Structural Concrete," and ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

B. Reinforcing Steel Standards: CRSI “Manual of Standard Practice.”

C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

D. Installer Qualifications: Use skilled workers trained and experienced in necessary crafts and familiar with requirements and methods needed for proper performance of Work of this Section.

E. Equipment for mixing and transporting concrete shall conform to ASTM C94 or ASTM C685. Ready-mixed and site mixed concrete shall be batched, mixed and delivered in accordance with ASTM C94 or ASTM C685.

F. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS / PRODUCTS

A. Provide products by manufacturers indicated in this Section, or approved.
1. Substitutions: Submit according to requirements of Division 01 for “Substitutions.”

2.2 BASE COURSE MATERIAL

A. Class 2 Aggregate Base mineral aggregate as specified in Section 32 11 23 – Aggregate Base Courses, of these Specifications.

2.3 PRIME AND TACK COATS

A. Prime Coat: Liquid asphalt, slow curing type (SC-70 or SC-250, as applicable).

B. Tack Coat: Diluted SS-1 or SS-1h emulsion .

2.4 ASPHALT PAVING MATERIALS

A. Paving Asphalt: Steam-refined AR-4000 grade.

B. Aggregate: Type A, with the grading of the combined aggregate conforming to 1/2-inch maximum size, medium grading, or 3/4-inch maximum size, medium grading.

C. Mixing Facilities: Asphalt concrete surfacing material shall be furnished from an approved commercial asphalt central mixing plant.

2.5 MIX DESIGN

A. Design of asphaltic concrete mixes shall be provided by the Contractor and shall be obtained from a qualified independent testing laboratory or agency, properly equipped to design asphaltic concrete mixes. Costs of obtaining mix designs shall be at the Contractor’s expense.

B. Hot-Mix Asphalt: One or more courses of dense, hot-laid, hot-mix asphalt plant mixes complying with the requirements of the ODOT for asphalt concrete pavement and the following:
1. Surface and Base Course: ODOT 1/2" Dense Graded, Level 2 Hot Mixed Asphaltic Concrete utilizing 64-22 grade asphalt.

PART 3 - EXECUTION

3.1 BASE COURSE PLACEMENT

A. Base course shall be minimum uniform thickness after compaction of dimensions indicated. Where not indicated, compacted thickness shall be 6 inches for parking stalls and walkways, and 8 inches for driveways and aisles of parking areas.

B. Base course shall be placed over finished sub grade and compacted in accordance with Section 32 11 23 - Aggregate Base Courses.

3.2 PLACING ASPHALT CONCRETE

A. Areas to be paved shall be covered with a layer of hot asphalt concrete surfacing not less than the thickness indicated after compaction. Where not indicated, compacted thickness shall be 2 inches for parking stalls, and 2-1/2 inches for walkways, driveways and aisles of parking areas.

B. Before placing asphalt concrete on untreated base, a liquid asphalt prime coat shall be applied to the base course in the areas to be surfaced.

C. Before placing asphalt concrete, a tack coat (paint binder) shall be applied to all vertical surfaces against which asphalt concrete surfacing will be placed. Tack coat (paint binder) shall be applied at the rate of from 0.02 to 0.10 gallons per square yard.

D. Finish surface of the wearing course shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, cold joints, or other irregularities.

E. Finish paving shall conform to slopes, lines, and finish grades indicated, and shall drain properly. Where adjacent surfaces are intended to be flush (as at concrete gutters, walks, and paving), they shall conform smoothly at all joints.

F. Ridges, indentations, and other objectionable marks left in the surface of the asphalt concrete by paving or rolling equipment shall be eliminated by rolling. The use of equipment that leaves ridges, indentations, or other objectionable marks in the asphalt concrete shall be discontinued, and other acceptable equipment shall be employed.

G. Where cold joints are indicated or necessary, cut back the placed and compacted cold asphalt a minimum of 3 inches with a concrete or masonry power saw, so that a vertical face of compacted full thickness material is exposed. Treat this surface with a tack coat before proceeding with the placement of new asphaltic concrete surfacing.

H. Finish paving shall conform to finish elevations within plus or minus 0.01 of a foot and shall be level to within plus or minus 1/4 inch in 10 feet when measured with a 10-foot straightedge in any direction.

3.3 FIELD QUALITY CONTROL

A. The Contractor shall control the quality of the Work and shall provide adequate testing to assure compliance with these Specifications.

B. After completion of paving work, all paving shall be flooded with water, and any resulting "ponds" shall be ringed with chalk. Such hollows shall be corrected with addition of asphalt paving materials and re-rolling until all paving is completely level and free from hollows and high spots.

3.4 REPAIRS AND PROTECTION

C. Surface Repairs for Exposed Concrete: Any portion of work that retains water will be repaired or replaced. Ponding of water is unacceptable.

1. Thoroughly clean, dampen with water and brush-coat area to be patched with Bonding Agent.
2. Fill honeycomb voids and rock pockets with patching compound.
3. Compact in place and screed as recommended by patching compound manufacturer.
4. Finish to match adjoining work
5. If defects in color and texture of surface cannot be repaired, remove and replace concrete.

D. Replace damaged and defective grout and anchoring cement work.

E. Protection:

1. Protect concrete from frost damage until protected by soil backfill or until cured for 28 days.
2. Protect concrete from physical damage or reduced strength caused by air temperatures below 45 degrees F. and above 75 degrees F. during curing period, complying with recommendations in ACI 306R and 305R respectively.
3. Protect concrete from shrinkage crack damage until protected by curing procedure.
4. Cover fresh grout and anchoring cement with plywood or oriented strand board for 24 hours minimum, where exposed to public, pedestrian, and animal traffic.

F. Physical Barrier Protection:

1. Barricade area containing fresh concrete slabs, stairs, ramps and walks for 24 hours minimum.
2. Cover fresh concrete with plywood where exposed to public, pedestrian, and animal traffic.

END OF SECTION

LIMITED ASBESTOS SURVEY REPORT

Elmonica Elementary School
Security Upgrades Project

16950 SW Lisa Court
Beaverton, OR 97006

Prepared for:

Beaverton School District
16550 SW Merlo Road
Beaverton, OR 97006

Report Date: March 25, 2021

Prepared By:

4105 SE International Way, Suite 505, Milwaukie, OR 97222

TRC Project: 432557.0002

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 Elmonica Elementary School located at 16950 SW Lisa Court, Beaverton, Oregon 97006. Mr. Ron Landolt, Asbestos Hazard Emergency Response Act (AHERA) accredited Asbestos Building Inspector, performed the survey on March 15, 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 security upgrades.

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled during this survey contained detectable levels of asbestos, based on the PLM method. Any materials uncovered during future 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 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 Elmonica Elementary School located at 16950 SW Lisa Court, Beaverton, Oregon 97006. The survey activities were initiated on March 15, 2021, by Ron Landolt, 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. Ron Landolt, 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 TRC Labs, a National Voluntary Laboratory Accreditation Program (NVLAP) certified laboratory (NVLAP code #101424-0) located in Windsor, Conneticut.

FINDINGS

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled contained detectable levels of asbestos, based on the PLM method.

Negative Materials (No Asbestos Detected)

Results of the bulk sampling indicated none of the following sampled materials contained no detectable levels of asbestos, based on the PLM method:

BSD-Elmonica Elementary School			
Sample No.	**Materials / Areas**	**Material Location**	**Estimated Quantity**
EES-S-01A EES-S-01B EES-S-01C	Gypsum Board and Joint Compound with Vinyl Covering	Throughout	8,000 SF
EES-S-02A EES-S-02B EES-S-02C	4" Black Cove Base & Associated Glue	Throughout	1,200 LF
EES-S-03A EES-S-03B EES-S-03C	2' x 4' Drop-in Ceiling Tile with Fissures and Pinholes	Throughout	6,500 SF
EES-S-04A EES-S-04B EES-S-04C	Carpet Glue	Throughout	6,800 SF
EES-S-05A EES-S-05B EES-S-05C	Countertop Glue	Classroom B112	120 SF

RECOMMENDATIONS

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled during this survey contained detectable levels of asbestos, based on the PLM method. Any materials uncovered during future renovation/demolition activities that are not addressed in this inspection report, or assumed asbestos-containing material, must be sampled by an accredited asbestos inspector prior to any 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.

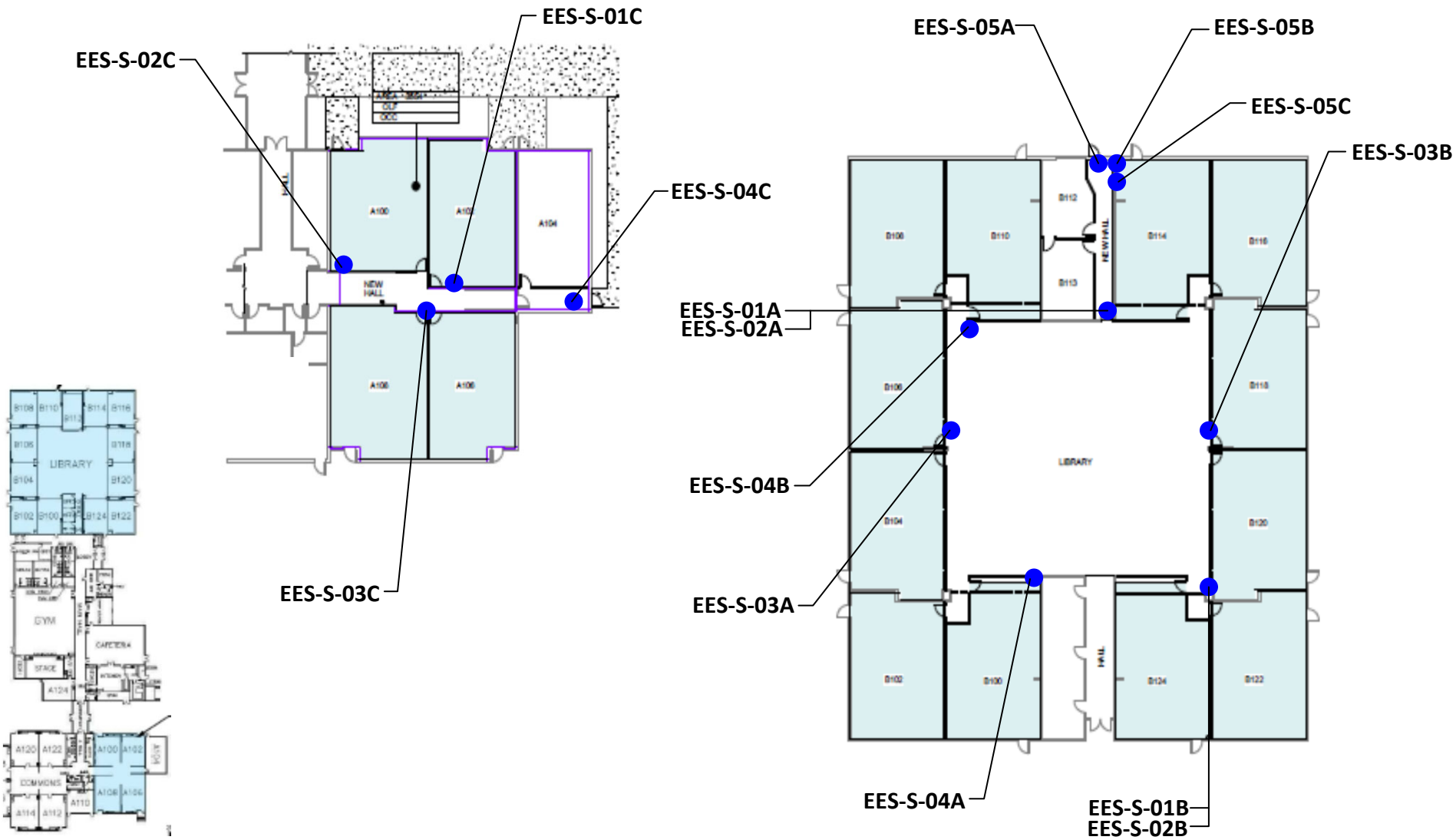
This limited asbestos survey report is designed to aid the property owner, architect, construction manager, general contractor, remediation contractor and/or asbestos abatement contractor in locating asbestos containing materials, and is not to be used as a bidding document.

Sincerely,
TRC Environmental Corporation

Matthew Cuda
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

ELMONICA ELEMENTARY SCHOOL
SECURITY UPGRADES
16950 SW LISA COURT
BEAVERTON, OREGON 97006

TRC Project No.: 432557.0002		Figure: 1
Drawn by: MC	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 B – REPRESENTATIVE PHOTOGRAPHS

TRC | mobile data solutions

March 25, 2021

BSD-ELMONICA ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: EES-S-01A, EES-S-01B, EES-S-01C
Material Description: Gypsum Board And Joint Compound W/ Vinyl Covering
Material Color: Not Indicated
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Negative
Asbestos Type: No Asbestos Detected
Homogeneous Area: Throughout
Total Approximate Quantity: 8000 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable

Sample Numbers: EES-S-02A, EES-S-02B, EES-S-02C
Material Description: 4" Black Cove Base And Glue
Material Color: Not Indicated
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Negative
Asbestos Type: No Asbestos Detected
Homogeneous Area: Throughout
Total Approximate Quantity: 1200 LF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable

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March 25, 2021

BSD-ELMONICA ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: EES-S-03A, EES-S-03B, EES-S-03C **Material Description:** 2' X 4' Drop-in Ceiling Tiles W/ Fissures And Pinholes **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 6500 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	
Sample Numbers: EES-S-04A, EES-S-04B, EES-S-04C **Material Description:** Carpet Glue **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 6800 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	

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March 25, 2021

BSD-ELMONICA ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: EES-S-05A, EES-S-05B, EES-S-05C
Material Description: Countertop Glue
Material Color: Not Indicated
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Negative
Asbestos Type: No Asbestos Detected
Homogeneous Area: Classroom B112
Total Approximate Quantity: 120 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable

APPENDIX C – LABORATORY RESULTS AND CHAIN OF CUSTODY

Industrial Hygiene Laboratory
21 Griffin Road North
Windsor, CT 06095
(860) 298-6308

BULK ASBESTOS ANALYSIS REPORT

CLIENT: Beaverton School District

Lab Log #: 0056581
Project #: 432557.0002.0000
Date Received: 03/16/2021
Date Analyzed: 03/17/2021

Site: Elmonica Elementary School, 16950 SW Lisa Court, Beaverton, OR

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Sample Location	Homogeneous Material Description	Other Matrix Materials		Asbestos %	Asbestos Type
EES-S-01A	See Diagram	LAYER 1 White joint compound		- - -	ND	None
EES-S-01A		LAYER 2 Off White gypsum board		- - -	ND	None
EES-S-01B	See Diagram	LAYER 1 White joint compound		- - -	ND	None
EES-S-01B		LAYER 2 Off White gypsum board		- - -	ND	None
EES-S-01C	See Diagram	LAYER 1 Beige vinyl covering	80%	synthetic fiber	ND	None
EES-S-01C		LAYER 2 White joint compound		- - -	ND	None
EES-S-01C		LAYER 3 Off White gypsum board		- - -	ND	None
EES-S-02A	See Diagram	LAYER 1 Beige/Brown glue		- - -	ND	None
EES-S-02A		LAYER 2 Black 4" cove base		- - -	ND	None
EES-S-02B	See Diagram	LAYER 1 Brown glue		- - -	ND	None
EES-S-02B		LAYER 2 Black 4" cove base		- - -	ND	None
EES-S-02C	See Diagram	LAYER 1 Beige glue		- - -	ND	None
EES-S-02C		LAYER 2 Black 4" cove base		- - -	ND	None
EES-S-03A	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	20% 60%	cellulose mineral wool	ND	None
EES-S-03B	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	20% 60%	cellulose mineral wool	ND	None
EES-S-03C	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	20% 60%	cellulose mineral wool	ND	None
EES-S-04A	See Diagram	Brown/Blue carpet glue		- - -	ND	None

Industrial Hygiene Laboratory
21 Griffin Road North
Windsor, CT 06095
(860) 298-6308

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Sample Location	Homogeneous Material Description	Other Matrix Materials	Asbestos %	Asbestos Type
EES-S-04B	See Diagram	Yellow/Blue carpet glue	- - -	ND	None
EES-S-04C	See Diagram	Yellow/Grey carpet glue	- - -	ND	None
EES-S-05A	See Diagram	Yellow countertop glue	- - -	ND	None
EES-S-05B	See Diagram	Yellow countertop glue	- - -	ND	None
EES-S-05C	See Diagram	Yellow countertop glue	- - -	ND	None

ND - asbestos was not detected
Trace - asbestos was observed at level of 1% or less - This is the reporting limit
NA/PS - Not Analyzed / Positive Stop
SNA - Sample Not Analyzed- See Chain of Custody for details
Notes: Asbestos-Containing Material (ACM) is any material containing more than 1% asbestos

Note: Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. In those cases, EPA recommends, and certain states (e.g. NY) require, that negative results be confirmed by quantitative transmission electron microscopy.

The Laboratory at TRC follows the EPA's Interim Method for the Determination of Asbestos in Bulk Insulation 1982 (EPA 600/M4-82-020) Bulk Analysis Code 18/A01 and the EPA recommended Method for the Determination of Asbestos in Bulk Building Materials July 1993, R.L. Perkins and B.W. Harvey, (EPA/600/R-93/116) Bulk Analysis Code 18/A03, which utilize polarized light microscopy (PLM). Our analysts have completed an accredited course in asbestos identification. TRC's Laboratory is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), for Bulk Asbestos Fiber Analysis, NVLAP Code 18/A01, effective through June 30, 2021. TRC is accredited by the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC in the Industrial Hygiene Program (IHLAP) for PLM effective through October 1, 2022. Asbestos content is determined by visual estimate unless otherwise indicated. Quality Control is performed in-house on at least 10% of samples and QC data related to the samples is available upon written request from client.

Analyzed by: K. Williamson — Kathleen Williamson, Laboratory Manager

Reviewed by: Joel Corso, Approved Signatory

Date Issued 03/19/2021

56581

TRC

4105 SE International Way, Suite 505, Milwaukie, OR 97222

ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM

Client: Beaverton School District	Project Number: 432557.0002	Sampling Technician: Ron Landolt Mobile App: Portland - HAZMAT Survey
Project Name: BSD-Elmonica Elementary School Elmonica Elementary School	Tracking Number:	Requested TAT: 3 DAY

ASBESTOS BULK SAMPLE INFORMATION

Sample Date	Sample Identification	Material Description	Homogeneous Area	Sample Location	Lab Identification (Lab Use Only)
03/15/21	EES-S-01A	Gypsum Board and Joint Compound w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	EES-S-01B	Gypsum Board and Joint Compound w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	EES-S-01C	Gypsum Board and Joint Compound w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	EES-S-02A	4" Black Cove Base and Glue	Throughout	See Diagram	
03/15/21	EES-S-02B	4" Black Cove Base and Glue	Throughout	See Diagram	
03/15/21	EES-S-02C	4" Black Cove Base and Glue	Throughout	See Diagram	
03/15/21	EES-S-03A	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	EES-S-03B	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	EES-S-03C	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	EES-S-04A	Carpet Glue	Throughout	See Diagram	
03/15/21	EES-S-04B	Carpet Glue	Throughout	See Diagram	
03/15/21	EES-S-04C	Carpet Glue	Throughout	See Diagram	
03/15/21	EES-S-05A	Countertop Glue	Classroom B112	See Diagram	
03/15/21	EES-S-05B	Countertop Glue	Classroom B112	See Diagram	
03/15/21	EES-S-05C	Countertop Glue	Classroom B112	See Diagram	

KW

56581

Special Instruction to Laboratory:
N/A

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	Date and Time	Received By:	Date and Time
1. (Print): Ron Landolt	03/15/2021 12:45 pm America/Los_Angeles	K Williamson	3/16/21 1400
. (Sign):			
II. (Print):			
(Sign):			

Email Results To:	Analytical Method:	Lab Comments:
jstone@trccompanies.com,mcuda@trccompanies.com,rlandolt@trccompanies.com	PLM EPA 600/R-93/116	

APPENDIX D – CERTIFICATIONS

CALINC TRAINING LLC

This is to certify that

Ron Landolt

has successfully completed an A.H.E.R.A course approved by the Department of Industrial Relations Division of Occupational Safety and Health of the State of California entitled

Asbestos Building Inspector Refresher

as required under Toxic Substances Control Act Title II

10/30/2020		164931
Class Date(s)		Certificate Number
David Esparza - President	CA-001-06	10/30/2021
	Cal/OSHA Number	Expiration Date

2040 Peabody Road Vacaville, CA 95687 Phone (800) 359-4467 Fax (707) 446-9072

LIMITED ASBESTOS SURVEY REPORT

Errol Hassell Elementary School

18100 SW Bany Road
Beaverton, OR 97007

Prepared for:

Beaverton School District

16550 SW Merlo Road
Beaverton, OR 97006

Inspection Dates: March 15, 2021
Report Prepared: March 25, 2021

Prepared By:

4105 SE International Way, Suite 505
Milwaukie, OR 97222
503.387.3251

TRC Project Number: 432557.0003

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 Errol Hassell Elementary School located at 18100 SW Bany Road in Beaverton, Oregon 97007. Mr. Ron Landolt, AHERA accredited building inspector performed the survey on March 15th, 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 be sampled, and submission of bulk samples for laboratory analysis.

ASBESTOS MATERIAL SUMMARY

Suspect asbestos containing building materials were sampled and submitted under the chain-of-custody (COC) protocol to an accredited laboratory for polarized light microscopy (PLM) bulk sample analysis. Inspection, sampling and analytical procedures were performed in general accordance with the U.S. Environmental Protection Agency's (EPA's) National Emission Standards for Hazardous Air Pollutants (NESHAP) EPA 40 CFR 61 Subpart M, the EPA Asbestos Hazard Emergency Response Act (AHERA) 40 CFR Part 763, and Federal Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101 guidelines.

Results of the bulk sampling indicated none of the materials sampled during this survey contained detectable levels of asbestos (>1%), based on the PLM method.

The following materials sampled during this investigation were identified as OSHA Regulated Materials (OSHA) (Trace or <1%):

- Cove Base Mastic

Additionally, any materials uncovered during renovation 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.

INTRODUCTION

A limited asbestos survey was conducted by TRC at Errol Hassell Elementary School, located at 18100 SW Bany Road in Beaverton, Oregon. It was reported by the client that this limited hazardous materials survey is being conducted in conjunction with their security upgrade project. The survey activities were performed on March 15th, 2021 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. Sample locations are presented on the Sample Location Diagrams in Appendix A. Representative Photographs are presented in Appendix B and Laboratory analytical results are presented in Appendix C.

Mr. Ron Landolt, AHERA accredited building inspector conducted the survey inspection and sampling activities. Copies of training certificates and state licenses (where applicable) are presented in Appendix D, Inspector Certifications.

BACKGROUND

Asbestos Containing Materials
The United States Environmental Protection Agency (EPA) define an asbestos-containing material (ACM) as any material containing more than one percent (>1.0%) asbestos by weight. In addition, ACMs are designated as:

Friable asbestos - material which can be crumbled, pulverized or reduced to powder by hand pressure, a.k.a. Regulated Asbestos Containing Materials (RACM).

Category I Non-friable - includes resilient floor coverings, asphalt roofing products, gaskets and packing.

Category II Non-friable - any non-friable ACM that is not in Category I (i.e. Asbestos-cement (Transite) siding or roofing material).

OSHA Regulated Materials
The Occupational Safety and Health Administration (OSHA) regulates all materials containing any detectable level of asbestos by weight, including those materials containing 1.0% or less.

Asbestos Sampling and Analytical Procedures
Representative bulk samples of suspect asbestos-containing building materials were randomly collected from the interior of the building. Homogenous material determination was based on the following criteria:

- Similar physical characteristics (same color and texture, etc.),
- Application (sprayed or trowel-on, assembly into a system, etc.),
- Material function (thermal insulation, floor tile, wallboard system, etc.).

The bulk samples were collected, labeled, and shipped to the certified analytical laboratory under proper COC documentation, and condition and approximate quantity assessments were performed by the accredited inspector during the inspection.

Laboratory services were provided by TRC Labs, in Windsor, Connecticut, a National Voluntary Laboratory Accreditation Program (NVLAP code #101424-0).

Bulk samples were analyzed by PLM utilizing the EPA's Test Methods: Methods for the Determination of Asbestos in Bulk Building Materials (EPA 600/R-93/116, March 1993) and the McCrone Research Institute's The Asbestos Particle Atlas as method references.

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 estimates the relative amounts of each constituent by determining the estimated area of the asbestos compared with the area estimate of the total sample.

ASBESTOS FINDINGS & RECOMMENDATIONS

The following table presents the location and quantities of each suspect building material identified and sampled during this survey as well as all applicable analytical results:

Sample No.	Material	Sample Location	Asbestos Content	Approximate Quantity
EHES-S-01A EHES-S-01B EHES-S-01C	Gypsum Board and Joint Compound	Throughout	ND	8,000 SF
EHES-S-02A EHES-S-02B EHES-S-02C	Gypsum Board with Vinyl Covering	Throughout	ND	1,800 SF
EHES-S-03A EHES-S-03B EHES-S-03C	**4" Cove Base and Glue**	**Throughout**	**Trace (<1%)**	**1,800 LF**
EHES-S-04A EHES-S-04B EHES-S-04C	2' x 4' Drop-in Ceiling Tiles with Fissures and Pinholes	Throughout	ND	5,600 SF
EHES-S-05A EHES-S-05B EHES-S-05C	Carpet Glue	Throughout	ND	6,200 SF
EHES-S-06A EHES-S-06B EHES-S-06C	Countertop Glue	Classroom A112	ND	120 SF

ND = Non-detect SF = Square feet LF = Linear Feet N/A = Not Applicable

Asbestos Containing Materials (ACMs)

Results of bulk sampling indicated none of the materials sampled during this limited survey contained detectable levels of asbestos (>1%), based on the PLM method.

OSHA Regulated Materials (<1%)

Material	Approximate Location(s)	Approximate Quantity
4" Cove Base and Glue	Throughout	1,800 LF

Non-Detect Materials (ND)

Asbestos was not detected in the following materials sampled during this investigation:

Material	Location
Gypsum Board and Joint Compound	Throughout
Gypsum Board with Vinyl Covering	Throughout
2' x 4' Drop-in Ceiling Tiles with Fissures and Pinholes	Throughout
Carpet Glue	Throughout
Countertop Glue	Classroom A112

Due to the Site being an occupied building at the time of the inspection and sampling, a full destructive investigation for concealed materials was not performed. Hidden building materials (e.g., old floor mastic patches hidden under carpeting, chalkboard mastic, mirror mastic, wood paneling mastic, etc.), other than those discussed in this report, could be uncovered when removing building finishes during renovation activities. Any materials encountered during the renovation activities that are not identified in this report, should either be presumed to be asbestos containing and handled as ACM or be sampled by an accredited asbestos inspector to determine if it contains asbestos.

RECOMMENDATIONS

All identified asbestos containing and OSHA regulated 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 the Beaverton School District, 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 by other parties.

This asbestos survey report is designed to aid the property owner, architect, construction manager, general contractor, and asbestos abatement contractor in locating potential ACMs. This report is not intended for, and may not be utilized as, a bidding document or as an abatement project specification document.

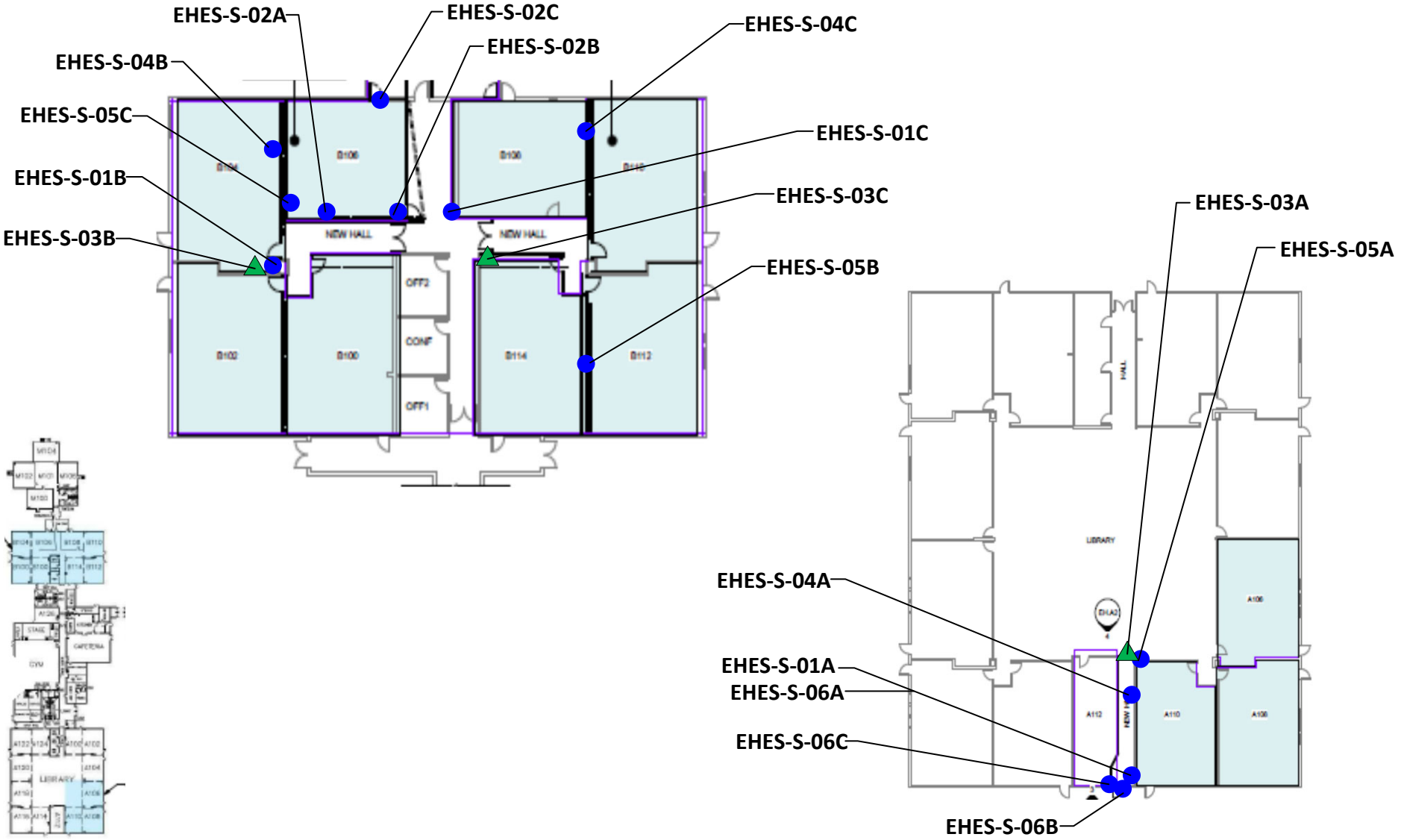
If you have any questions, or need any further clarification regarding this report, please do not hesitate to contact Mr. Ron Landolt at (503) 407-0734.

Sincerely,
TRC Environmental Corporation

Matthew Cuda
Project Manager

Ron Landolt, CAC
NW Region BSI Practice Manager

Appendix A – Figure(s)



LEGEND

- Non-Asbestos Sample Location
- OSHA Regulated Sample Location
- Asbestos-Containing Sample Location

LIMITED ASBESTOS SURVEY REPORT
SAMPLE LOCATION DIAGRAM

ERROL HASSELL ELEMENTARY SCHOOL
SECURITY UPGRADES
18100 SW BANY ROAD
BEAVERTON, OREGON 97007

TRC Project No.: 432557.0003		Figure: 1
Drawn by: MC	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 B – Representative Photographs

TRC | mobile data solutions

March 25, 2021

BSD-ERROL HASSELL ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: EHES-S-01A, EHES-S-01B, EHES-S-01C
Material Description: Gypsum Board and Joint Compound
Material Color: Not Indicated
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Negative
Asbestos Type: No Asbestos Detected
Homogeneous Area: Throughout
Total Approximate Quantity: 8000 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable

Sample Numbers: EHES-S-02A, EHES-S-02B, EHES-S-02C
Material Description: Gypsum Board w/ Vinyl Covering
Material Color: Not Indicated
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Negative
Asbestos Type: No Asbestos Detected
Homogeneous Area: Throughout
Total Approximate Quantity: 1800 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable

TRC | mobile data solutions

March 25, 2021

BSD-ERROL HASSELL ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: EHES-S-03A, EHES-S-03B, EHES-S-03C **Material Description:** 4" Cove Base and Glue **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Glue - Trace (<1%) **Asbestos Type:** Chrysotile **Homogeneous Area:** Throughout **Total Approximate Quantity:** 1800 LF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	
Sample Numbers: EHES-S-04A, EHES-S-04B, EHES-S-04C **Material Description:** 2' X 4' Drop-in Ceiling Tiles w/ Fissures And Pinholes **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 5600 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	

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March 25, 2021

BSD-ERROL HASSELL ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: EHES-S-05A, EHES-S-05B, EHES-S-05C **Material Description:** Carpet Glue **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 6200 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	
Sample Numbers: EHES-S-06A, EHES-S-06B, EHES-S-06C **Material Description:** Countertop Glue **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Classroom A112 **Total Approximate Quantity:** 120 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	

Appendix C – Laboratory Analytical Data Sheets

Industrial Hygiene Laboratory
21 Griffin Road North
Windsor, CT 06095
(860) 298-6308

BULK ASBESTOS ANALYSIS REPORT

CLIENT: Beaverton School District

Lab Log #: 0056582
Project #: 432557.0003.0000
Date Received: 03/16/2021
Date Analyzed: 03/18/2021

Site: Errol Hassell Elementary School, 18100 SW Bany Road, Beaverton, OR

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Sample Location	Homogeneous Material Description	Other Matrix Materials		Asbestos %	Asbestos Type
EHES-S-01A	See Diagram	LAYER 1 White joint compound		- - -	ND	None
EHES-S-01A		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
EHES-S-01B	See Diagram	LAYER 1 White joint compound		- - -	ND	None
EHES-S-01B		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
EHES-S-01C	See Diagram	LAYER 1 White joint compound		- - -	ND	None
EHES-S-01C		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
EHES-S-02A	See Diagram	LAYER 1 Beige vinyl covering	60%	cellulose	ND	None
EHES-S-02A		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
EHES-S-02B	See Diagram	LAYER 1 Beige vinyl covering	60%	cellulose	ND	None
EHES-S-02B		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
EHES-S-02C	See Diagram	LAYER 1 Tan vinyl covering	60%	synthetic fiber	ND	None
EHES-S-02C		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
EHES-S-03A	See Diagram	LAYER 1 Tan/Brown glue		- - -	Trace	Chrysotile
EHES-S-03A		LAYER 2 Black 4" cove base		- - -	ND	None
EHES-S-03B	See Diagram	LAYER 1 Black-Brown glue		- - -	Trace	Chrysotile
EHES-S-03B		LAYER 2 Black 4" cove base		- - -	ND	None
EHES-S-03C	See Diagram	LAYER 1 Tan/Brown glue		- - -	ND	None
EHES-S-03C		LAYER 2 Black 4" cove base		- - -	ND	None

Industrial Hygiene Laboratory
21 Griffin Road North
Windsor, CT 06095
(860) 298-6308

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Sample Location	Homogeneous Material Description	Other Matrix Materials		Asbestos %	Asbestos Type
EHES-S-04A	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	5% 90%	cellulose mineral wool	ND	None
EHES-S-04B	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	5% 90%	cellulose mineral wool	ND	None
EHES-S-04C	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	5% 90%	cellulose mineral wool	ND	None
EHES-S-05A	See Diagram	Orange/Tan carpet glue		- - -	ND	None
EHES-S-05B	See Diagram	Orange/Tan carpet glue		- - -	ND	None
EHES-S-05C	See Diagram	Orange/Tan carpet glue		- - -	ND	None
EHES-S-06A	See Diagram	Yellow countertop glue	30%	cellulose	ND	None
EHES-S-06B	See Diagram	Green-Yellow countertop glue		- - -	ND	None
EHES-S-06C	See Diagram	Green-Yellow countertop glue		- - -	ND	None

ND - asbestos was not detected
Trace - asbestos was observed at level of 1% or less - This is the reporting limit
NA/PS - Not Analyzed / Positive Stop
SNA - Sample Not Analyzed- See Chain of Custody for details
Notes: Asbestos-Containing Material (ACM) is any material containing more than 1% asbestos

Note: Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. In those cases, EPA recommends, and certain states (e.g. NY) require, that negative results be confirmed by quantitative transmission electron microscopy.

The Laboratory at TRC follows the EPA's Interim Method for the Determination of Asbestos in Bulk Insulation 1982 (EPA 600/M4-82-020) Bulk Analysis Code 18/A01 and the EPA recommended Method for the Determination of Asbestos in Bulk Building Materials July 1993, R.L. Perkins and B.W. Harvey, (EPA/600/R-93/116) Bulk Analysis Code 18/A03, which utilize polarized light microscopy (PLM). Our analysts have completed an accredited course in asbestos identification. TRC's Laboratory is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), for Bulk Asbestos Fiber Analysis, NVLAP Code 18/A01, effective through June 30, 2021. TRC is accredited by the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC in the Industrial Hygiene Program (IHLAP) for PLM effective through October 1, 2022. Asbestos content is determined by visual estimate unless otherwise indicated. Quality Control is performed in-house on at least 10% of samples and QC data related to the samples is available upon written request from client.

Analyzed by: K. Williamson — Kathleen Williamson, Laboratory Manager

Reviewed by: Joel Corso, Approved Signatory

Date Issued 03/19/2021

56582

TRC

4105 SE International Way, Suite 505, Milwaukie, OR 97222

ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM

Client: Beaverton School District	Project Number: 432557.0003	Sampling Technician: Ron Landolt Mobile App: Portland - HAZMAT Survey
Project Name: BSD-Errol Hassell Elementary School Errol Hassell Elementary School	Tracking Number:	Requested TAT: 3 DAY

ASBESTOS BULK SAMPLE INFORMATION

Sample Date	Sample Identification	Material Description	Homogeneous Area	Sample Location	Lab Identification (Lab Use Only)
03/15/21	EHES-S-01A	Gypsum Board and Joint Compound	Throughout	See Diagram	
03/15/21	EHES-S-01B	Gypsum Board and Joint Compound	Throughout	See Diagram	
03/15/21	EHES-S-01C	Gypsum Board and Joint Compound	Throughout	See Diagram	
03/15/21	EHES-S-02A	Gypsum Board w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	EHES-S-02B	Gypsum Board w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	EHES-S-02C	Gypsum Board w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	EHES-S-03A	4" Cove Base and Glue	Throughout	See Diagram	
03/15/21	EHES-S-03B	4" Cove Base and Glue	Throughout	See Diagram	
03/15/21	EHES-S-03C	4" Cove Base and Glue	Throughout	See Diagram	
03/15/21	EHES-S-04A	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	EHES-S-04B	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	EHES-S-04C	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	EHES-S-05A	Carpet Glue	Throughout	See Diagram	
03/15/21	EHES-S-05B	Carpet Glue	Throughout	See Diagram	
03/15/21	EHES-S-05C	Carpet Glue	Throughout	See Diagram	

56582

03/15/21	EHES-S-06A	Countertop Glue	Classroom A112	See Diagram	
03/15/21	EHES-S-06B	Countertop Glue	Classroom A112	See Diagram	
03/15/21	EHES-S-06C	Countertop Glue	Classroom A112	See Diagram	

Special Instruction to Laboratory:
N/A

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	**Date and Time**	**Received By:**	**Date and Time**
1. (Print): Ron Landolt	03/15/2021 1:18 pm America/Los_Angeles	Williamson	3/16/21 1400
. (Sign):			
II. (Print):			
(Sign):			

Email Results To:	**Analytical Method:**	**Lab Comments:**
jstone@trccompanies.com,mcuda@trccompanies.com,rlandolt@trccompanies.com	PLM EPA 600/R-93/116	

Appendix D – Inspector Certification(s)

CALINC TRAINING LLC

This is to certify that

Ron Landolt

has successfully completed an A.H.E.R.A course approved by the Department of Industrial Relations Division of Occupational Safety and Health of the State of California entitled

Asbestos Building Inspector Refresher

as required under Toxic Substances Control Act Title II

10/30/2020		164931
Class Date(s)		Certificate Number
David Esparza - President	CA-001-06	10/30/2021
	Cal/OSHA Number	Expiration Date

2040 Peabody Road Vacaville, CA 95687 Phone (800) 359-4467 Fax (707) 446-9072

LIMITED ASBESTOS SURVEY REPORT

Greenway Elementary School
Security Upgrades Project

9150 SW Downing Drive
Beaverton, OR 97008

Prepared for:

Beaverton School District
16550 SW Merlo Road
Beaverton, OR 97006

Report Date: March 25, 2021

Prepared By:

4105 SE International Way, Suite 505, Milwaukie, OR 97222

TRC Project: 432557.0004

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 Greenway Elementary School located at 9150 SW Downing Drive, Beaverton, Oregon 97008. Mr. Ron Landolt, Asbestos Hazard Emergency Response Act (AHERA) accredited Asbestos Building Inspector, performed the survey on March 15, 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 security upgrades.

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled during this survey contained detectable levels of asbestos, based on the PLM method. Any materials uncovered during future 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 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 Greenway Elementary School located at 9150 SW Downing Drive, Beaverton, Oregon 97008. The survey activities were initiated on March 15, 2021, by Ron Landolt, 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. Ron Landolt, 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 TRC Labs, a National Voluntary Laboratory Accreditation Program (NVLAP) certified laboratory (NVLAP code #101424-0) located in Windsor, Conneticut.

FINDINGS

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled contained detectable levels of asbestos, based on the PLM method.

Negative Materials (No Asbestos Detected)

Results of the bulk sampling indicated none of the following sampled materials contained no detectable levels of asbestos, based on the PLM method:

BSD- Greenway Elementary School			
Sample No.	**Materials / Areas**	**Material Location**	**Estimated Quantity**
GES-S-01A GES-S-01B GES-S-01C	Gypsum Board and Joint Compound	Throughout	8,000 SF
GES-S-02A GES-S-02B GES-S-02C	Wall Panels with Vinyl Covering	Throughout	2,400 SF
GES-S-03A GES-S-03B GES-S-03C	4" Black Cove Base and Associated Glue	Throughout	1,200 LF
GES-S-04A GES-S-04B GES-S-04C	2' x 4' Drop-in Ceiling Tile with Fissures and Pinholes	Throughout	12,000 SF
GES-S-05A GES-S-05B GES-S-05C	Carpet Glue	Throughout	6,500 SF
GES-S-06A GES-S-06B GES-S-06C	Vinyl Countertop Glue	Classroom A112	120 SF

RECOMMENDATIONS

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled during this survey contained detectable levels of asbestos, based on the PLM method. Any materials uncovered during future renovation/demolition activities that are not addressed in this inspection report, or assumed asbestos-containing material, must be sampled by an accredited asbestos inspector prior to any 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.

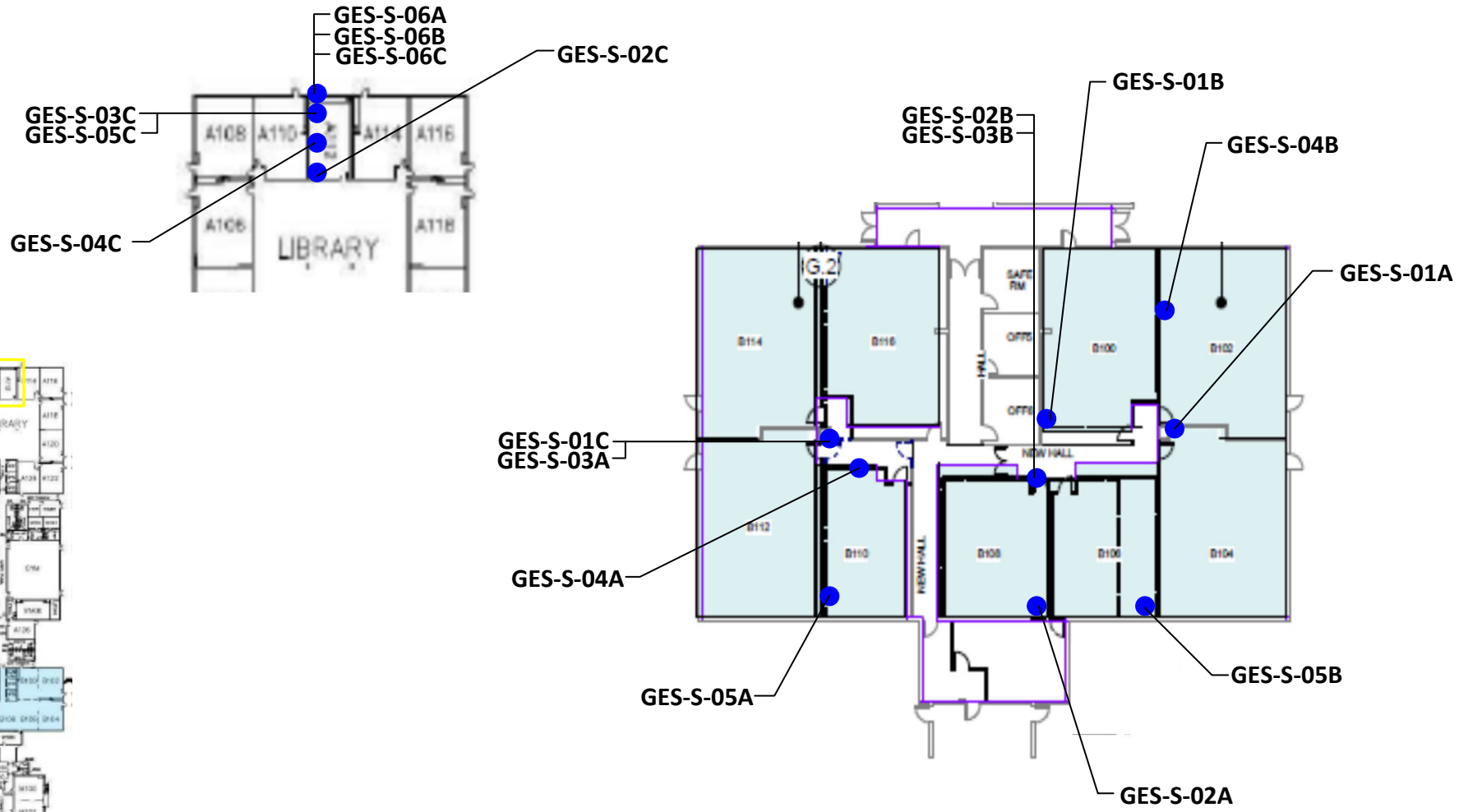
This limited asbestos survey report is designed to aid the property owner, architect, construction manager, general contractor, remediation contractor and/or asbestos abatement contractor in locating asbestos containing materials, and is not to be used as a bidding document.

Sincerely,
TRC Environmental Corporation

Matthew Cuda
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

GREENWAY ELEMENTARY SCHOOL
SECURITY UPGRADES
9150 SW DOWNING DRIVE
BEAVERTON, OREGON 97008

TRC Project No.: 432557.0005		Figure: 1
Drawn by: MC	Reviewed by: RAL	Date: March 2021

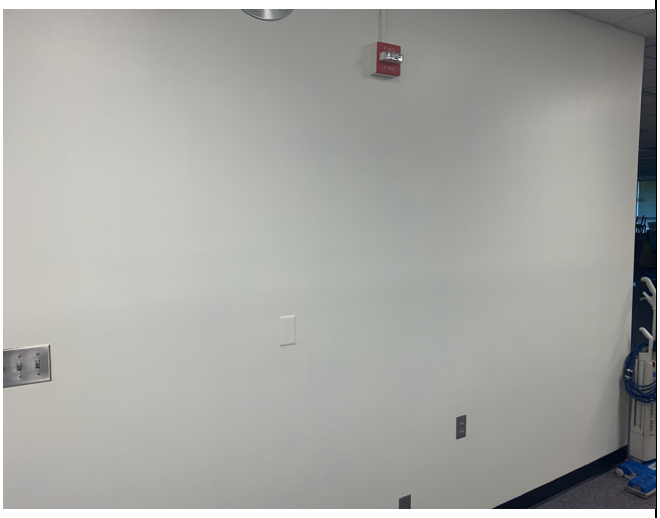
TRC
4105 SE International Way, Suite 505
Milwaukie, Oregon 97222
Phone: (503) 387-3251 Fax: (503) 908-1318

APPENDIX B – REPRESENTATIVE PHOTOGRAPHS

TRC | mobile data solutions

March 25, 2021

BSD-GREENWAY ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: GES-S-01A, GES-S-01B, GES-S-01C **Material Description:** Gypsum Board And Joint Compound **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 8000 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	
Sample Numbers: GES-S-02A, GES-S-02B, GES-S-02C **Material Description:** Wall Panels W/ Vinyl Covering **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 2400 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	

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March 25, 2021

BSD-GREENWAY ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: GES-S-03A, GES-S-03B, GES-S-03C **Material Description:** 4" Black Cove Base And Glue **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 1200 LF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	
Sample Numbers: GES-S-04A, GES-S-04B, GES-S-04C **Material Description:** 2' X 4' Drop-in Ceiling Tiles W/ Fissures And Pinholes **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 12000 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	

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March 25, 2021

BSD-GREENWAY ELEMENTARY SCHOOL – SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: GES-S-05A, GES-S-05B, GES-S-05C **Material Description:** Carpet Glue **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Throughout **Total Approximate Quantity:** 6500 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	
Sample Numbers: GES-S-06A, GES-S-06B, GES-S-06C **Material Description:** Vinyl Countertop Glue **Material Color:** Not Indicated **Accessible Material:** Accessible **Reason Inaccessible:** N/A **Asbestos Detected:** Negative **Asbestos Type:** No Asbestos Detected **Homogeneous Area:** Classroom A112 **Total Approximate Quantity:** 120 SF **Condition:** Good **Material Type:** Misc. **NESHAP Category:** N/A **Notes:** Not Applicable	

APPENDIX C – LABORATORY RESULTS AND CHAIN OF CUSTODY

Industrial Hygiene Laboratory
21 Griffin Road North
Windsor, CT 06095
(860) 298-6308

BULK ASBESTOS ANALYSIS REPORT

CLIENT: Beaverton School District

Lab Log #: 0056584
Project #: 432557.0004.0000
Date Received: 03/16/2021
Date Analyzed: 03/18/2021

Site: Greenway Elementary School, 9150 SW Downing Drive, Beaverton, OR

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Sample Location	Homogeneous Material Description	Other Matrix Materials		Asbestos %	Asbestos Type
GES-S-01A	See Diagram	LAYER 1 White joint compound		- - -	ND	None
GES-S-01A		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
GES-S-01B	See Diagram	LAYER 1 White joint compound		- - -	ND	None
GES-S-01B		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
GES-S-01C	See Diagram	LAYER 1 White joint compound		- - -	ND	None
GES-S-01C		LAYER 2 Off White gypsum board	2%	cellulose	ND	None
GES-S-02A	See Diagram	LAYER 1 Off White wall panel	2%	cellulose	ND	None
GES-S-02A		LAYER 2 Tan vinyl covering	80%	cellulose	ND	None
GES-S-02B	See Diagram	LAYER 1 Off White wall panel	2%	cellulose	ND	None
GES-S-02B		LAYER 2 Tan vinyl covering	80%	cellulose	ND	None
GES-S-02C	See Diagram	LAYER 1 Off White wall panel	2%	cellulose	ND	None
GES-S-02C		LAYER 2 Grey vinyl covering	80%	synthetic fiber	ND	None
GES-S-03A	See Diagram	LAYER 1 Beige glue		- - -	ND	None
GES-S-03A		LAYER 2 Black 4" cove base		- - -	ND	None
GES-S-03B	See Diagram	LAYER 1 Beige/Brown glue		- - -	ND	None
GES-S-03B		LAYER 2 Black 4" cove base		- - -	ND	None
GES-S-03C	See Diagram	LAYER 1 Beige/Dark Brown glue		- - -	ND	None
GES-S-03C		LAYER 2 Black 4" cove base		- - -	ND	None

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Windsor, CT 06095
(860) 298-6308

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Sample Location	Homogeneous Material Description	Other Matrix Materials		Asbestos %	Asbestos Type
GES-S-04A	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	10% 80%	cellulose mineral wool	ND	None
GES-S-04B	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	10% 80%	cellulose mineral wool	ND	None
GES-S-04C	See Diagram	White/Grey 2' x 4' drop-in ceiling tiles	10% 80%	cellulose mineral wool	ND	None
GES-S-05A	See Diagram	Dark Yellow carpet glue		- - -	ND	None
GES-S-05B	See Diagram	Dark Yellow carpet glue		- - -	ND	None
GES-S-05C	See Diagram	Dark Yellow carpet glue		- - -	ND	None
GES-S-06A	See Diagram	Green-Yellow vinyl countertop glue		- - -	ND	None
GES-S-06B	See Diagram	Green-Yellow vinyl countertop glue		- - -	ND	None
GES-S-06C	See Diagram	Green-Yellow vinyl countertop glue		- - -	ND	None

ND - asbestos was not detected
Trace - asbestos was observed at level of 1% or less - This is the reporting limit
NA/PS - Not Analyzed / Positive Stop
SNA - Sample Not Analyzed- See Chain of Custody for details
Notes: Asbestos-Containing Material (ACM) is any material containing more than 1% asbestos

Note: Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. In those cases, EPA recommends, and certain states (e.g. NY) require, that negative results be confirmed by quantitative transmission electron microscopy.

The Laboratory at TRC follows the EPA's Interim Method for the Determination of Asbestos in Bulk Insulation 1982 (EPA 600/M4-82-020) Bulk Analysis Code 18/A01 and the EPA recommended Method for the Determination of Asbestos in Bulk Building Materials July 1993, R.L. Perkins and B.W. Harvey, (EPA/600/R-93/116) Bulk Analysis Code 18/A03, which utilize polarized light microscopy (PLM). Our analysts have completed an accredited course in asbestos identification. TRC's Laboratory is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), for Bulk Asbestos Fiber Analysis, NVLAP Code 18/A01, effective through June 30, 2021. TRC is accredited by the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC in the Industrial Hygiene Program (IHLAP) for PLM effective through October 1, 2022. Asbestos content is determined by visual estimate unless otherwise indicated. Quality Control is performed in-house on at least 10% of samples and QC data related to the samples is available upon written request from client.

Analyzed by: K. Williamson — Kathleen Williamson, Laboratory Manager

Reviewed by: Joel Corso, Approved Signatory

Date Issued 03/19/2021

56584

TRC

4105 SE International Way, Suite 505, Milwaukie, OR 97222

ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM

Client: Beaverton School District	Project Number: 432557.0004	Sampling Technician: Ron Landolt Mobile App: Portland - HAZMAT Survey
Project Name: BSD-Greenway Elementary School Greenway Elementary School	Tracking Number:	Requested TAT: 3 DAY

ASBESTOS BULK SAMPLE INFORMATION

Sample Date	Sample Identification	Material Description	Homogeneous Area	Sample Location	Lab Identification (Lab Use Only)
03/15/21	GES-S-01A	Gypsum Board and Joint Compound	Throughout	See Diagram	
03/15/21	GES-S-01B	Gypsum Board and Joint Compound	Throughout	See Diagram	
03/15/21	GES-S-01C	Gypsum Board and Joint Compound	Throughout	See Diagram	
03/15/21	GES-S-02A	Wall Panels w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	GES-S-02B	Wall Panels w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	GES-S-02C	Wall Panels w/ Vinyl Covering	Throughout	See Diagram	
03/15/21	GES-S-03A	4" Black Cove Base and Glue	Throughout	See Diagram	
03/15/21	GES-S-03B	4" Black Cove Base and Glue	Throughout	See Diagram	
03/15/21	GES-S-03C	4" Black Cove Base and Glue	Throughout	See Diagram	
03/15/21	GES-S-04A	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	GES-S-04B	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	GES-S-04C	2' x 4' Drop-in Ceiling Tiles w/ Fissures and Pinholes	Throughout	See Diagram	
03/15/21	GES-S-05A	Carpet Glue	Throughout	See Diagram	
03/15/21	GES-S-05B	Carpet Glue	Throughout	See Diagram	
03/15/21	GES-S-05C	Carpet Glue	Throughout	See Diagram	

KW

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03/15/21	GES-S-06A	Vinyl Countertop Glue	Classroom A112	See Diagram	
03/15/21	GES-S-06B	Vinyl Countertop Glue	Classroom A112	See Diagram	
03/15/21	GES-S-06C	Vinyl Countertop Glue	Classroom A112	See Diagram	

Special Instruction to Laboratory:
N/A

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	**Date and Time**	**Received By:**	**Date and Time**
1. (Print): Ron Landolt	03/15/2021 12:31 pm America/Los_Angeles	K Williamson	3/16/21 1400
. (Sign):			
II. (Print):			
(Sign):			

Email Results To:	**Analytical Method:**	**Lab Comments:**
jstone@trccompanies.com,mcuda@trccompanies.com,rlandolt@trccompanies.com	PLM EPA 600/R-93/116	

APPENDIX D – CERTIFICATIONS

CALINC TRAINING LLC

This is to certify that

Ron Landolt

has successfully completed an A.H.E.R.A course approved by the Department of Industrial Relations Division of Occupational Safety and Health of the State of California entitled

Asbestos Building Inspector Refresher

as required under Toxic Substances Control Act Title II

10/30/2020		164931
Class Date(s)		Certificate Number
David Esparza - President	CA-001-06	10/30/2021
	Cal/OSHA Number	Expiration Date

2040 Peabody Road Vacaville, CA 95687 Phone (800) 359-4467 Fax (707) 446-9072