

# BSD 2021 Roofing Projects – Elmonica Elem. School

## TECHNICAL SPECIFICATIONS



PROJECT NUMBER: 20Y082.06

BID SET: OCTOBER 28, 2020



**AIA DOCUMENT A101-2017** *STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR*

- (INCORPORATED BY REFERENCE)

**AIA DOCUMENT A201-2017** *GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION*

- (INCORPORATED BY REFERENCE)

**BSD TECHNICAL STANDARDS** STANDARDS FOR DESIGN AND CONSTRUCTION OF ALL DISTRICT FACILITIES

- (INCORPORATED BY REFERENCE—PLEASE SEE WEBSITE)

<https://www.beaverton.k12.or.us/departments/facilities-development/technical-standards>

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**DIVISION 4 MASONRY (NOT USED)**

**DIVISION 5 METALS**

055000 Metal Fabrications

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061000 Rough Carpentry

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**

075423 Thermoplastic Polyolefin (TPO) Membrane Roofing

**DIVISION 8 OPENINGS (NOT USED)**

**DIVISION 9 FINISHES (NOT USED)**

**APPENDIX A: ROOF INSPECTION REPORT**

- By A-Tech Northwest, Inc. dated 03/26/2020

**APPENDIX B: MOISTURE SURVEY REPORT**

- By RDH Building Science dated 10/12/2020

END OF SECTION

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## **LIST OF DRAWINGS**

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## **PROJECT TEAM**

### OWNER

Beaverton School District

16550 SW Merlo Rd

Beaverton, OR 97003

Contact: Megan Finch, Project Manager

E-Mail: [megan\\_finch@beaverton.k12.or.us](mailto:megan_finch@beaverton.k12.or.us)

Phone: (503) 356-4318

Contact: Angela Knotts, Project Coordinator

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Phone: (503) 356-4576

### ARCHITECT/ STRUCTURAL ENGINEER

CIDA

15895 SW 72<sup>ND</sup> Ave, Suite 200

Portland, OR 97224

Contact: Dustin Johnson

E-Mail: [dustinj@cidainc.com](mailto:dustinj@cidainc.com)

Phone: (503) 226-1285

Contact: Curtis Gagner

E-Mail: [curtisg@cidainc.com](mailto:curtisg@cidainc.com)

Phone: (503) 226-1285

### ROOFING CONSULTANT

RDH Building Science

5331 S Macadam Ave. #314

Portland, OR 97239

Contact: Kathleen Smith

E-mail: [ksmith@rdh.com](mailto:ksmith@rdh.com)

Phone: (503) 821-7321

Contact: Scott Mecalis

E-Mail: [smecalis@rdh.com](mailto:smecalis@rdh.com)

Phone: (503) 867-8519

### HAZARDOUS MATERIAL SURVEYOR

TRC Solutions

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Milwaukie, OR 97222

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Phone: (503) 387-3251

### GENERAL CONTRACTOR

TBD

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

#### B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

### 1.2 PROJECT INFORMATION

#### A. Project Identification: BSD 2021 Roofing Projects: Elmonica Elementary School

1. Project Location: 16950 SW Lisa Ct, Beaverton, OR 97006

### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

#### A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. New roofing overlay over existing build-up roofing system at modular classrooms. See architectural plans for areas that are not in scope.

#### B. Type of Contract.

1. Project will be constructed under a single prime contract.
  - a. *Standard Form of Agreement Between Owner and Contractor AIA Document A101, 2017 Edition Modified.*
  - b. *General Conditions of the Contract for Construction AIA Document A201, 2017 Edition Modified.*

### 1.4 ACCESS TO SITE

- #### A. General:
- Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

## 1.5 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
  - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
  - 3. Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

## 1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
  - 2. Comply with noise ordinances of the authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building and site as follows:
  - 1. Weekdays: 7:00 a.m. to 7:00 p.m (Custodian until 3:30 p.m.).
  - 2. Saturdays and Sundays: Arrange with Owner's Representative
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
  - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products, E-cigarettes/vape devices and other controlled substances on the Project site is not permitted.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Section:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

### 1.2 DEFINITIONS

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

### 1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. Schedule:
  - 1. A "Schedule of Unit Prices" is included at the end of this section.
  - 2. Include as part of each unit price, miscellaneous devices, appurtenances and similar items incidental to or required for a complete system whether or not mentioned as part of the unit price.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 Schedule of Unit Prices:

- A. New Sheet Metal Fabrications at Roof Edge Conditions
  - 1. New 24 ga. pre-finished sheet metal gutter and downspouts (Unit: Cost per lineal foot)
  - 2. New 24ga. pre-finished sheet metal coping cap (Unit: Cost per lineal foot)
- B. Roof Sheathing Replacement at Roof Overlay Areas
  - 1. Roof sheathing replacement at areas discovered during construction to be damaged or rotted. This item includes roof sheathing found to be rotted or damaged as a result of physical investigation. For the purpose of this unit price item, assume up to 900 square feet of sheathing to be replaced.
- C. Interior Roof Drain
  - 1. Replacement of entire roof drain assembly, including sump, drain bowl, clamp ring and strainer. Include associated cost of modifying the drain plumbing as needed. For the purpose of this unit price item, assume replacement of up to one full roof drain assemblies.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

### 1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

### 1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Architect to forward any substitution to BSD representative for approval prior to acceptance by the Architect.
  - 1. Substitution Request Form: Use CSI Substitution Request Form 1.5C provided at the end of this section.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Certificates and qualification data, where applicable or requested.
    - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
    - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided

within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 fifteen days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
  - a. Requested substitution has been approved by the Owner.
  - b. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - e. Requested substitution is compatible with other portions of the Work.
  - f. Requested substitution has been coordinated with other portions of the Work.
  - g. Requested substitution provides specified warranty.
  - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed.

## PART 3 - EXECUTION (Not Used)

END OF SECTION





# 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 ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ \_\_\_\_\_

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination drawings.
  - 2. Requests for Information (RFIs).
  - 3. Project Web site.
  - 4. Project meetings.

### 1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, Consultant or Contractor seeking information from each other during construction.

### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.

6. Preinstallation conferences.
7. Project Closeout Conference.
8. Startup and adjustment of systems.
9. Project closeout activities.

#### 1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing and electrical Work.
  2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Review: Architect/Consultant will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility.

#### 1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect/Consultant will return RFIs submitted to Architect/Consultant by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

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- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to the District.
- D. Architect's Action: Architect/Consultant will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect/Consultant after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's/Consultant's action may include a request for additional information, in which case the allotted time for response will date from time of receipt of additional information.
  3. Architect's/Consultant's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect/Consultant and Owner's Representative in writing within seven days of receipt of the RFI response.
- E. On receipt of Architect's/Consultant's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect/Consultant and Owner's Representative within seven days if Contractor disagrees with response.

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- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site (e-Builder).

## 1.6 PROPOSAL REQUESTS

- A. Proposal Request Log: Contractor shall maintain a current log of all proposed requests and submit same at each project meeting and with each application for payment. Each proposal request shall have a unique number for tracking purpose. The log shall, at a minimum, show the proposal request number, date initiated, brief description, reference (i.e. RFI or supplemental instruction), estimated cost, estimated time, status, and reason for the proposal request (i.e. Unforeseen Condition/ Regulatory Requirement/ Owner Request/ E&O).

## 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner's Representative and Architect/Consultant of scheduled meeting dates and times.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner's Representative and Architect/Consultant, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
  - 1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Sustainable design requirements.

- l. Preparation of record documents.
    - m. Use of the premises and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.
    - q. Responsibility for temporary facilities and controls.
    - r. Procedures for moisture and mold control.
    - s. Procedures for disruptions and shutdowns.
    - t. Construction waste management and recycling.
    - u. Parking availability.
    - v. Office, work, and storage areas.
    - w. Equipment deliveries and priorities.
    - x. First aid.
    - y. Security.
    - z. Progress cleaning.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
  1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/ Consultant and Owner's Representative of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.

- w. Required performance results.
  - x. Protection of adjacent work.
  - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at intervals indicated in Owner/Contractor Agreement.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect/ Consultant, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Progress cleaning.
      - 10) Quality and work standards.
      - 11) Status of correction of deficient items.
      - 12) Field observations.
      - 13) Status of RFIs.
      - 14) Status of proposal requests.
      - 15) Pending changes.
      - 16) Status of Change Orders.

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- 17) Pending claims and disputes.
    - 18) Documentation of information for payment requests.
  3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Project Closeout Conference: Conduct conference prior to Substantial Completion.
  1. Attendees: Owner, Architect/ Consultant, Contractor.
  2. Agenda: Procedures for completing and archiving closeout deliverables in e-Builder;
    - a. Requirements for preparing Record Documents;
    - b. Requirements for preparing O&Ms;
    - c. Submittal of warranties;
    - d. Requirements for delivery of Maintenance stock;
    - e. Requirements for demonstration and training.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION



## PART 1 - GENERAL

### 1.1 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 and with website’s training documents uploaded to the project folder.
- 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’s Representative: Owner shall pay for and provide licenses/access for the following members of the project team.
  - 1. Lead member of Architect’s/Consultant’s design team responsible.
  - 2. Contractor’s project manager or lead member of Contractor’s project staff.
  - 3. Others as deemed appropriate by Owner’s Representative.

Project Number: **20Y082.01****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 ay 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](http://www.e-builder.net)).
  - d. Users are recommended to have a properly licensed version 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 user’s 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’S 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.

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- 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. All other communication shall be conducted in an industry standard manner.
  - 5. Submittals, contracts, meeting minutes, and other project records.
  - 6. Application for payments.
  - 7. Project closeout.
- 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 communications 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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.1 CONSTRUCTION PROGRESS DOCUMENTATION

- A. Progress Schedules and Reports: The Contractor, within ten calendar days after being awarded the Contract, shall prepare and submit for the information of the Owner's Representative and the Architect/Consultant a Progress Schedule in critical path management ("CPM") format satisfactory to the Owner's 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 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 the 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.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

### 1.2 QUALITY CONTROL

- A. Submit 3-week work schedule, shop drawings, product data, samples, schedule of values and record documents as follows:
  - 1. Submit to Architect/Consultant and Owner's Representative only through General Contractor.
  - 2. The General Contractor shall provide a set of submittals to the Owner's Representative for review and approval concurrent with review by the Architect and Consultant(s).

### 1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's/ Consultant's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
  - 1. Architect/Consultant will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital data files are provided for Contractor's convenience and to help expedite the submittal preparation process. Use of the digital data files is at Contractor's risk and does not release the Contractor from verifying and indicating as-built conditions which may or may not be indicated in the digital data files.
    - c. Contractor shall execute a release of Architect's/Consultant's liability for Contractor's use of the digital data files. Release form shall be provide by Architect/Consultant.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect and Consultant reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

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- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect/Consultant's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Consultant or Owner's Representative will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect/Consultant.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01).

Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/ Consultant.
  4. Include the following information on an inserted cover sheet:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Name of subcontractor.
    - h. Name of supplier.
    - i. Name of manufacturer.
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Related physical samples submitted directly.
    - n. Other necessary identification.
- F. Options: Identify options requiring selection by the Architect.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's/ Consultant's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals that are marked with approval notation from Architect's or Consultant's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

#### A. General Submittal Procedure Requirements:

1. Post electronic submittals as PDF electronic files directly to e-Builder.
  - a. Architect/Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

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2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures." All closeout submittals to be uploaded to e-Builder in format acceptable to the District.
  3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
  4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data without field-verifying as-built conditions which may or may not be indicated at part of the released digital data files.



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1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
  3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/ Consultant will return submittal with options selected.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or

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containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect/Consultant will retain two Sample sets; remainder will be returned.

- 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Submit product schedule in the following format:

- a. PDF electronic file.

- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

- G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

- H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

1. Submit subcontract list in the following format:

- a. PDF electronic file.

- J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

- K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

- M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

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- N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Consultant and Owner's Representative.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S/ CONSULTANT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect/ Consultant will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect or Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

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.
- 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 Owner's Representative's discretion, the superintendent may be issued a building key to allow access to areas 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 authority.
- K. Contractor shall 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 need to get an ID badge and a hard hat sticker (not provided by BSD), 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 and a hat sticker. The following are the convicted crimes that may appear on the background check:

- Aggravated Murder of 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
- 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 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
- Sadoomasochistic 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 (Including firearms located in a locked 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.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Consultant, Owner's Representative, or authorities having jurisdiction are not limited by provisions of this Section.

### 1.2 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

### 1.3 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.



10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### 1.4 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect/Consultant and Owner's Representative with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

## 1.5 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. **Testing Agency Responsibilities:** Cooperate with Architect, Consultant, Owner's Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect/Consultant, Owner's Representative and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- F. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

#### 1.6 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner's Representative will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:
  1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect/Consultant and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect/Consultant and Owner's Representative with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected work.

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION

##### 3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

## PART 1 - GENERAL

### 1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

### 1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### 1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl1

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association (Now part of CPA)
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute
AIA	American Institute of Architects (The)

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AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
APA EWS	APA - The Engineered Wood Association; Engineered Wood Systems (See APA - The Engineered Wood Association)
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
AWCI	Association of the Wall and Ceiling Industry
AWCMA	American Window Covering Manufacturers Association (Now WCMA)
AWI	Architectural Woodwork Institute

AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	BICSI, Inc.
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
BSD	Beaverton School District
BWF	Badminton World Federation (Formerly: IBF - International Badminton Federation)
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CEA	Consumer Electronics Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRRC	Cool Roof Rating Council
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association
CRI	Carpet and Rug Institute (The)



CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
EIA	Electronic Industries Alliance
EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association (Electrostatic Discharge Association)
ETL SEMCO	Intertek ETL SEMCO (Formerly: ITS - Intertek Testing Service NA)
FIBA	Federation Internationale de Basketball (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FM Approvals	FM Approvals LLC
FM Global	FM Global (Formerly: FMG - FM Global)
FMRC	Factory Mutual Research (Now FM Global)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association

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FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Part of GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation (Now BWF)
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
ISO	International Organization for Standardization Available from ANSI
ISSFA	International Solid Surface Fabricators Association

ITS	Intertek Testing Service NA (Now ETL SEMCO)
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LMA	Laminating Materials Association (Now part of CPA)
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association, Inc.
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association
NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association
NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable & Telecommunications Association

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NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NOMMA	National Ornamental & Miscellaneous Metals Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)
NWWDA	National Wood Window and Door Association (Now WDMA)
OPL	Omega Point Laboratories, Inc. (Now ITS)
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting & Decorating Contractors of America

PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)
SPRI	Single Ply Roofing Industry

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SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc. (Now TCNA)
TCNA	Tile Council of North America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society
TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WIC	Woodwork Institute of California (Now WI)

WMPMA        Wood Moulding & Millwork Producers Association

WSRCA        Western States Roofing Contractors Association

WWPA        Western Wood Products Association

C.    Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl2

IAPMO       International Association of Plumbing and Mechanical Officials

ICC        International Code Council

ICC-ES      ICC Evaluation Service, Inc.

UBC        Uniform Building Code  
(See ICC)

D.    Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl3

CE        Army Corps of Engineers

CPSC       Consumer Product Safety Commission

DOC        Department of Commerce

DOD        Department of Defense

DOE        Department of Energy

EPA        Environmental Protection Agency

FAA        Federal Aviation Administration

FCC        Federal Communications Commission

FDA        Food and Drug Administration

GSA        General Services Administration

HUD        Department of Housing and Urban Development

LBL        Lawrence Berkeley National Laboratory

NCHRP      National Cooperative Highway Research Program  
(See TRB)

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NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
PBS	Public Buildings Service (See GSA)
PHS	Office of Public Health and Science
RUS	Rural Utilities Service (See USDA)
SD	State Department
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl4

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board
CFR	Code of Federal Regulations Available from Government Printing Office
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point
DSCC	Defense Supply Center Columbus (See FS)
FED-STD	Federal Standard (See FS)
FS	Federal Specification Available from Department of Defense Single Stock Point  Available from Defense Standardization Program  Available from General Services Administration  Available from National Institute of Building Sciences



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FTMS      Federal Test Method Standard  
(See FS)

MIL      (See MILSPEC)

MIL-STD   (See MILSPEC)

MILSPEC   Military Specification and Standards  
Available from Department of Defense Single Stock Point

UFAS      Uniform Federal Accessibility Standards  
Available from Access Board

F.      State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl5

CBHF   State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR      California Code of Regulations

CPUC   California Public Utilities Commission

TFS      Texas Forest Service  
Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

### 1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect/Consultant, Owner's Representative, testing agencies, and authorities having jurisdiction. Temporary facilities required for the project include but may not be limited to:
  - 1. Sanitary Facilities
  - 2. Telephone/Fax
  - 3. Internet
- B. Water from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

### 1.4 QUALITY ASSURANCE

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

### 1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures."

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  - 1. Provide portable facilities as required for workmen. Keep facilities clean and in sanitary condition. Remove from the site upon completion of the Work.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
  - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. At a conspicuous place within the primary field office post a list of important telephone numbers, including:
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Architect's office.
    - e. Engineers' offices.
    - f. Owner's Representative's office.
    - g. Principal subcontractors' field and home offices.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- B. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- C. Temporary Enclosures: Contractor to provide Weather Mitigation Plan in the event of rain and to establish procedures for temporary protection as well as an emergency contact list, please see roofing specification 075423 for additional information. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

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- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Prohibit smoking in construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  - 3. Develop and supervise an overall fire-prevention -and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### 3.4 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  - 1. 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 to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION

## 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/Consultant and Owner's Representative.
- 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 by the Architect/Consultant or Owner's Representative.
- 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 submittal to the Architect through the Owner's Project Management Database (e-Builder).\
- 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.

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1. Consult with Architect/Consultant 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Coordination of Owner-installed products.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
  - 8. Correction of the Work.
- B. Related Sections:
  - 1. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 2. Division 01 Section "Cutting and Patching".

### 1.2 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.



1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect and Owner's Representative for the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner's Representative that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect/ Consultant according to requirements in Division 01 Section "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and as-built conditions. If discrepancies are discovered, notify Architect/ Consultant promptly.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Allow for building movement, including thermal expansion and contraction.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

**3.5 PROGRESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

**3.6 STARTING AND ADJUSTING**

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

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- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

### 3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

### 1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio. Notify A/E immediately and without further modification to structural elements if such compromise to structure inadvertently occurs.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Notify A/E immediately if such compromise to operational elements inadvertently occurs.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials. Submit 3 samples for Architect and Owner approval.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

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1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

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1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
1. Substantial Completion procedures.
  2. Final completion procedures.
  3. Warranties.
  4. Final cleaning.

### 1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  2. Advise Owner's Representative of pending insurance changeover requirements.
  3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  8. Complete startup testing of systems.
  9. Submit test/adjust/balance records.
  10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  11. Advise Owner of changeover in heat and other utilities.
  12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  13. Complete final cleaning requirements, including touchup painting.
  14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
  15. Prepare Closeout Log: An electronic spreadsheet log listing all closeout deliverables required in the specifications including contractor's record drawings, warranties, shop drawings, product data, extra stock, training and O&Ms. See Sample Closeout Log provided in at the end of this section.



- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  - 2. Results of completed inspection will form the basis of requirements for final completion.

### 1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
  - 1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
  - 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 4. Submit pest-control final inspection report and warranty.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### 1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize list of spaces in a sequential order.
  - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  - 3. Submit list of incomplete items in the following format:
    - a. PDF electronic file.

## 1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Scan warranties and bonds and assemble complete warranty and bond submittal package into individual PDF files organized by specification section.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
- m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
- o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- r. Leave Project clean and ready for occupancy.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operations and Maintenance Manual.
- B. See Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

### 1.2 SUBMITTALS

- A. Manual: Submit electronic manual in final form at least 15 days before final inspection. Architect/Consultant and Owner's Representative will return an electronic copy with comments within 15 days after final inspection.
  - 1. Correct or modify each manual to comply with Architect's comments. Submit final electronic copy of each corrected manual within 15 days of receipt of Architect's/Consultant's and Owner's Representative's comments.

## PART 2 - PRODUCTS

### 2.1 MANUAL, GENERAL

- A. Organization: Unless otherwise indicated, organize manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. The manual shall contain a title page, table of contents, and manual contents.
- B. Title Page: Include the following information:
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Name and address of Owner.
  - 4. Date of submittal.
  - 5. Name, address, and telephone number of Contractor.
  - 6. Name and address of Architect.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Arrange contents numerically by specification section.

**OPERATION INFORMATION**

- E. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.
- F. Descriptions: Include the following:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Equipment identification with serial number of each component.
  - 4. Equipment function.
  - 5. Operating characteristics.
  - 6. Limiting conditions.
  - 7. Performance curves.
  - 8. Engineering data and tests.
  - 9. Complete nomenclature and number of replacement parts.
- G. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
- H. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- I. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

**PRODUCT MAINTENANCE INFORMATION**

- J. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- K. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- L. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- M. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

- N. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- O. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

#### SYSTEMS AND EQUIPMENT MAINTENANCE INFORMATION

- P. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- Q. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- R. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:
- S. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions that detail essential maintenance procedures:
- T. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- U. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- V. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- W. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

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- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
- E. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. See Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
- C. See Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

### 1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Submit one set of marked-up Record Prints, and the following:
      - 1) Record CAD Drawing Files and Plots: One set.
      - 2) Copies printed from Record CAD Drawing Plots: One. Plot and print each Drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one copy copies of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
  - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.



Project Number: **20Y082.01**

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
  2. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Architect for resolution.
  4. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into single PDF file.
  2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
  4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

Project Number: **20Y082.01**

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

# PART 3 - EXECUTION

## 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION

PART 1 - GENERAL

1.1 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to Final Completion or acceptance, fully instruct the Owner's Designated Representative and maintenance personnel in the operation, adjustment, and maintenance of all products, equipment, and systems.
  - 1. The District reserves the right to videotape training sessions.
- B. Operating and maintenance manual shall constitute the basis of instruction.
  - 1. Review contents of manual with Owner's personnel in full detail to explain all aspects of operations and maintenance.
  - 2. Review complete heating and cooling cycles with Owner's Designated Representative. Review location of dampers, valves, and control equipment.

END OF SECTION

Project Number: **20Y082.01**

022623      LIMITED SUPPLEMENTAL ASBESTOS SURVEY REPORT  
(see next page)

# **LIMITED SUPPLEMENTAL ASBESTOS SURVEY REPORT**

## **Elmonica Elementary School Modular Building Roof**

**16950 SW Lisa Court  
Beaverton, OR 97006**

Prepared for:

### **Beaverton School District**

**16550 SW Merlo Road  
Beaverton, OR 97006**

**Inspection Dates:** August 11, 2020  
**Report Prepared:** September 2, 2020

Prepared By:



**4105 SE International Way, Suite 505  
Milwaukie, OR 97222  
503.387.3251**

TRC Project Number: 406451

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### Appendices

- Appendix A – Figures
- Appendix B – Laboratory Analytical Data Sheets
- Appendix C – Inspector Certification(s)

## **EXECUTIVE SUMMARY**

TRC Environmental Corporation (TRC) was contracted by the Beaverton School District to conduct a supplemental 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 in Beaverton, Oregon 97006. Mr. Matt Cuda, AHERA accredited building inspector performed the survey on August 11<sup>th</sup>, 2020. 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, based on the PLM method.

However, 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 supplemental asbestos survey was conducted by TRC at Elmonica Elementary School, located at 16950 SW Lisa Court in Beaverton, Oregon. It was reported by the client that this limited asbestos survey is being conducted in conjunction with their planned roof renovation project. The survey activities were performed on August 11<sup>th</sup>, 2020, 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. Laboratory analytical results are presented in Appendix B.

Mr. Matt Cuda, 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

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 EMC Labs, Inc., in Phoenix, Arizona, 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, July 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
E-01A E-01B E-01C	Built-up Roofing with Gravel Overlay	Throughout Modular Building Roof	ND	N/A
E-02A E-02B E-02C	Gray Roof Caulking	Throughout Modular Building Roof	ND	N/A
E-03A E-03B E-03C	Silver Roof Paint	Throughout Modular Building Roof	ND	N/A
E-04A E-04B E-04C	Black Roof Caulking	Throughout Modular Building Roof	ND	N/A

ND = Non-detect

SF = Square feet

LF = Linear Feet

N/A = Not Applicable

### Asbestos Containing Materials (ACMs)

Results of the bulk sampling indicated none of the materials sampled during this limited survey contained detectable levels of asbestos, based on the PLM method.

### Non-Detect Materials (ND)

Asbestos was not detected in the following materials sampled during this investigation:

Material	Location
Built-up Roofing with Gravel Overlay	Throughout Modular Building Roof
Gray Roof Caulking	Throughout Modular Building Roof
Silver Roof Paint	Throughout Modular Building Roof
Black Roof Caulking	Throughout Modular Building Roof

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., hidden roofing materials, 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

Results of the bulk sampling indicated none of the materials sampled during this survey contained detectable levels of asbestos, based on the PLM method. 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**

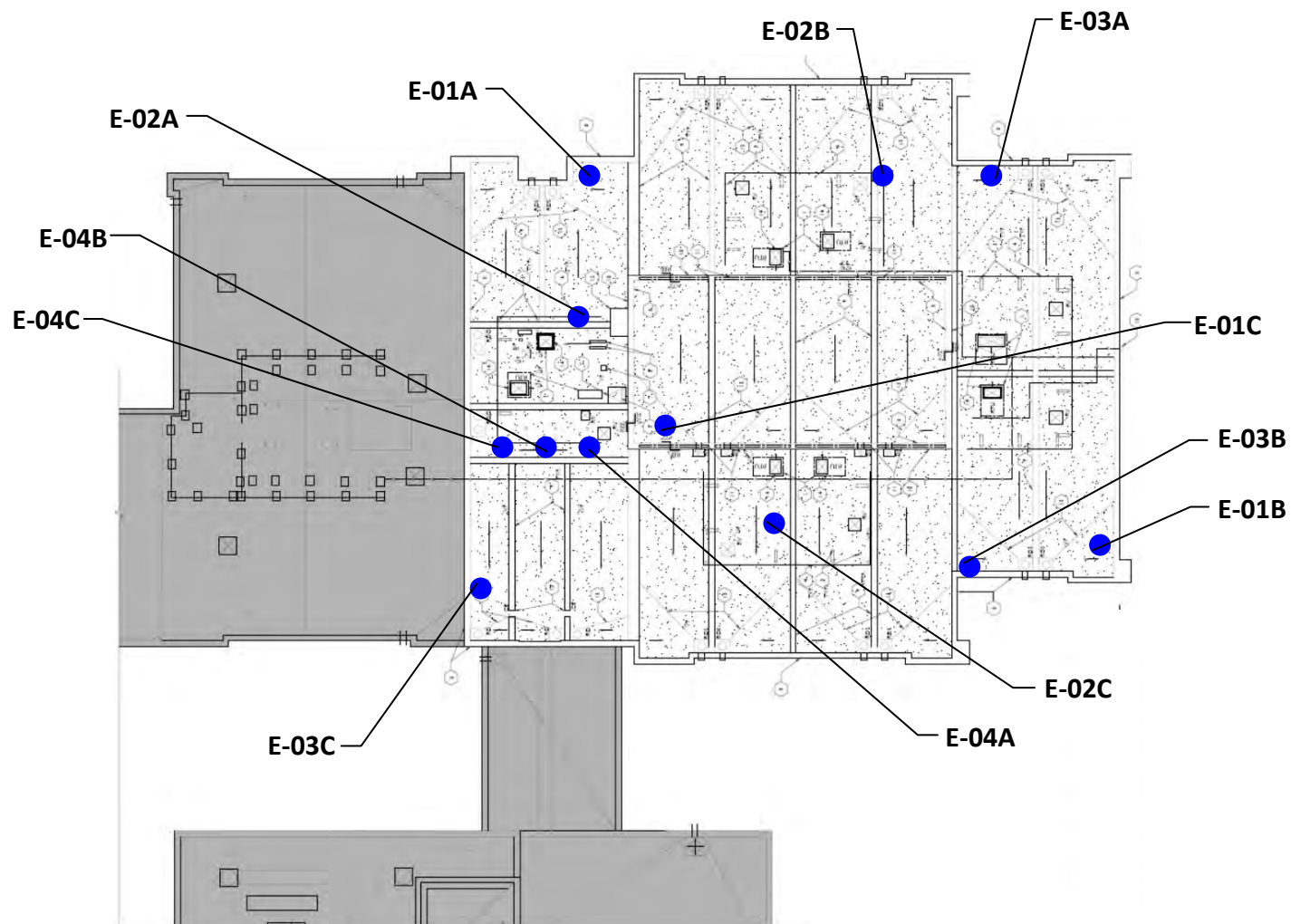


Matthew Cuda  
Project Manager



Ron Landolt, CAC  
NW Region BSI Practice Manager

## **Appendix A – Figure(s)**



#### LEGEND

- — Non-Asbestos Sample Location
- ★ — Asbestos-Containing Sample Location
- ▲ — OSHA Regulated Sample Location

#### ASBESTOS SURVEY REPORT SAMPLE LOCATION DIAGRAM

ELMONICA ELEMENTARY SCHOOL  
16950 SW LISA COURT  
BEAVERTON, OREGON 97006

TRC Project No.: 406451.0001

Figure: 1

Drawn by: MC

Reviewed by: RAL

Date: September 2020



4105 SE International Way, Suite 505  
Milwaukie, Oregon 97222  
Phone: (503) 387-3251 Fax: (503) 908-1318

## **Appendix B – Laboratory Analytical Data Sheets**

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0241379**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	TRC SOLUTIONS	Job# / P.O. #:	406451
Address:	4105 SE INTERNATIONAL WAY, STE 505	Date Received:	08/12/2020
	MILWAUKIE OR 97222	Date Analyzed:	08/13/2020
Collected:	08/11/2020	Date Reported:	08/17/2020
Project Name:	BSD-ELMONICA E.S. ROOF PROJECT	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0241379-001 E-01A	THROUGHOUT MODULAR BLDG ROOF	LAYER 1 Roofing, Black	No	None Detected	Fibrous Glass 15% Synthetic Fiber 4% Cellulose Fiber 1% Carbonates Quartz Binder/Filler 80%
		LAYER 2 Roofing, Black	No	None Detected	Cellulose Fiber 15% Synthetic Fiber 3% Fibrous Glass 2% Carbonates Quartz Binder/Filler 80%
		LAYER 3 Roofing, Black	No	None Detected	Cellulose Fiber 15% Fibrous Glass 15% Synthetic Fiber 10% Carbonates Quartz Binder/Filler 60%
		LAYER 4 Roofing, Black	No	None Detected	Cellulose Fiber 30% Fibrous Glass 5% Synthetic Fiber 5% Carbonates Quartz Binder/Filler 60%

Please see EMC Labs Sample Number 0241379-013 for Additional Layers

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	MILWAUKIE OR 97222	Date Analyzed:	08/13/2020
Collected:	08/11/2020	Date Reported:	08/17/2020
Project Name:	BSD-ELMONICA E.S. ROOF PROJECT	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0241379-002 E-01B	THROUGHOUT MODULAR BLDG ROOF	LAYER 1 Roofing, Black	No	None Detected	Fibrous Glass 15% Synthetic Fiber 4% Cellulose Fiber <1% Carbonates Quartz Binder/Filler 80%
		LAYER 2 Roofing, Black	No	None Detected	Fibrous Glass 15% Cellulose Fiber 3% Synthetic Fiber 2% Carbonates Quartz Binder/Filler 80%
		LAYER 3 Roofing, Black/ Gray	No	None Detected	Cellulose Fiber 85% Gypsum Quartz Carbonates Binder/Filler 15%
		LAYER 4 Foam, Yellow	No	None Detected	Foam 100%

Please see EMC Labs Sample Number 0241379-014 for Additional Layers

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Laboratory Report

**0241379**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

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Address:	4105 SE INTERNATIONAL WAY, STE 505	Date Received:	08/12/2020
	MILWAUKIE OR 97222	Date Analyzed:	08/13/2020
Collected:	08/11/2020	Date Reported:	08/17/2020
Project Name:	BSD-ELMONICA E.S. ROOF PROJECT	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0241379-003 E-01C	THROUGHOUT MODULAR BLDG ROOF	LAYER 1 Coating, Silver	No	None Detected	Carbonates Quartz Binder/Filler	100%
		LAYER 2 Roofing, Black	No	None Detected	Carbonates Quartz Binder/Filler	100%
		LAYER 3 Roofing, Black	No	None Detected	Cellulose Fiber Synthetic Fiber	5% 2%
				Carbonates Quartz Binder/Filler	93%	
		LAYER 4 Roofing, Black	No	None Detected	Fibrous Glass Synthetic Fiber Cellulose Fiber	25% 10% 5%
				Carbonates Quartz Binder/Filler	60%	
Please see EMC Labs Sample Number 0241379-015 for Additional Layers						
0241379-004 E-02A	THROUGHOUT MODULAR ROOF	Caulking, Gray	No	None Detected	Carbonates Quartz Binder/Filler	100%
0241379-005 E-02B	THROUGHOUT MODULAR ROOF	Caulking, Gray	No	None Detected	Carbonates Quartz Binder/Filler	100%



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Laboratory Report

**0241379**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client:	TRC SOLUTIONS	Job# / P.O. #:	406451
Address:	4105 SE INTERNATIONAL WAY, STE 505	Date Received:	08/12/2020
	MILWAUKIE OR 97222	Date Analyzed:	08/13/2020
Collected:	08/11/2020	Date Reported:	08/17/2020
Project Name:	BSD-ELMONICA E.S. ROOF PROJECT	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0241379-006 E-02C	THROUGHOUT MODULAR ROOF	LAYER 1 Caulking, Gray	No	None Detected	Carbonates Quartz Binder/Filler 100%
		LAYER 2 Caulking, Tan	No	None Detected	Carbonates Quartz Binder/Filler 100%
0241379-007 E-03A	THROUGHOUT MODULAR BLDG ROOF	Roof Paint, Silver	No	None Detected	Carbonates Quartz Binder/Filler 100%
0241379-008 E-03B	THROUGHOUT MODULAR BLDG ROOF	Roof Paint, Silver	No	None Detected	Carbonates Quartz Binder/Filler 100%
0241379-009 E-03C	THROUGHOUT MODULAR BLDG ROOF	Roof Paint, Silver	No	None Detected	Carbonates Quartz Binder/Filler 100%

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	MILWAUKIE OR 97222	Date Analyzed:	08/13/2020
Collected:	08/11/2020	Date Reported:	08/17/2020
Project Name:	BSD-ELMONICA E.S. ROOF PROJECT	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0241379-010 E-04A	THROUGHOUT MODULAR BLDG ROOF	LAYER 1 Caulking, Black	No	None Detected	
					Carbonates Quartz Binder/Filler
					100%
		LAYER 2 Caulking, Tan	No	None Detected	
0241379-011 E-04B	THROUGHOUT MODULAR BLDG ROOF	Caulking, Black	No	None Detected	
					Carbonates Quartz Binder/Filler
					100%
0241379-012 E-04C	THROUGHOUT MODULAR BLDG ROOF	Caulking, Black	No	None Detected	
					Carbonates Quartz Binder/Filler
					100%

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Laboratory Report

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	MILWAUKIE OR 97222	Date Analyzed:	08/17/2020
Collected:	08/11/2020	Date Reported:	08/17/2020
Project Name:	BSD-ELMONICA E.S. ROOF PROJECT	EPA Method:	EPA 600/R-93/116
Address:		Submitted By:	MATT CUDA
		Collected By:	

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents	
0241379-013 E-01A	THROUGHOUT MODULAR BLDG ROOF - ADDITIONAL LAYERS	LAYER 1 Roofing, Black/ Gray	No	None Detected	Cellulose Fiber	85%
					Gypsum Quartz Binder/Filler	15%
		LAYER 2 Foam, Yellow	No	None Detected	Foam	100%
		LAYER 3 Roofing, Black	No	None Detected	Fibrous Glass Carbonates Quartz Binder/Filler	20% 80%
0241379-014 E-01B	THROUGHOUT MODULAR BLDG ROOF - ADDITIONAL LAYERS	LAYER 4 Roofing, Black	No	None Detected	Fibrous Glass Carbonates Quartz Binder/Filler	20% 80%
		LAYER 1 Roofing, Black	No	None Detected	Fibrous Glass	20%
					Carbonates Quartz Binder/Filler	80%
		LAYER 2 Roofing, Black	No	None Detected	Fibrous Glass Carbonates Quartz Binder/Filler	20% 80%

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

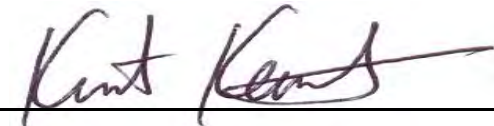
0241379

## Bulk Asbestos Analysis by Polarized Light Microscopy

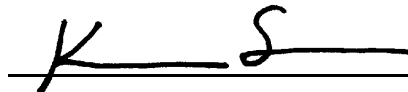
NVLAP#101926-0

Client: TRC SOLUTIONS Job# / P.O. #: 406451  
Address: 4105 SE INTERNATIONAL WAY, STE 505 Date Received: 08/12/2020  
MILWAUKIE OR 97222 Date Analyzed: 08/17/2020  
Collected: 08/11/2020 Date Reported: 08/17/2020  
Project Name: BSD-ELMONICA E.S. ROOF PROJECT EPA Method: EPA 600/R-93/116  
Address: Submitted By: MATT CUDA  
Collected By:

Lab ID Client ID	Sample Location	Layer Name / Sample Description	Asbestos Detected	Asbestos Type (%)	Non-Asbestos Constituents
0241379-015 E-01C	THROUGHOUT MODULAR BLDG ROOF - ADDITIONAL LAYERS	LAYER 1 Roofing, Black	No	None Detected	Fibrous Glass 20% Cellulose Fiber 10% Synthetic Fiber 5%
		LAYER 2 Roofing, Black	No	None Detected	Carbonates Quartz Binder/Filler 65% Fibrous Glass 20% Cellulose Fiber 7% Synthetic Fiber 3%
		LAYER 3 Roofing, Black/ Gray	No	None Detected	Carbonates Quartz Binder/Filler 70% Cellulose Fiber 85%
		LAYER 4 Foam, Yellow	No	None Detected	Gypsum Quartz Binder/Filler 15% Foam 100%



Analyst - Kurt Kettler



Signatory - Lab Manager - Ken Scheske

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicated or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. These reports are for the exclusive use of the addressed client and that they will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of thirty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method for asbestos. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. Polarized Light Microscopy may not be consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials.

# CHAIN OF CUSTODY

EMC Labs, Inc.  
9830 S. 51<sup>st</sup> St., Ste B-109  
Phoenix, AZ 85044  
(480) 940-5294 Fax (480) 893-1726

LAB#: 241379  
TAT: 3 Days  
Rec'd: AUG 12 P.M.

COMPANY NAME: TRC SOLUTIONS  
Address: 4105 SE International Way, Suite 505  
Milwaukie, Oregon 97222  
CONTACT: Ron Landolt Scan & Excel  
Phone/Fax: (503) 387-3251 / (503) 908-1318  
Email: rlandolt@trcsolutions.com and mcuda@trcsolutions.com

BILL TO: \_\_\_\_\_ (If Different Location)  
Phoenix, AZ \_\_\_\_\_

Now Accepting: **VISA - MASTERCARD**

Price Quoted: \$ \_\_\_\_\_ / Sample \$ \_\_\_\_\_ / Layers

**COMPLETE ITEMS 1-4: (Failure to complete any items may cause a delay in processing or analyzing your samples)**

**1. TURNAROUND TIME:** [Same Day Rush] [1-2 Days] [3-4-5 Days] [6-10 Days]

\*\*\*\*Prior confirmation of turnaround time is required

\*\*\*\*Additional charges for rush analysis (please call marketing department for pricing details)

\*\*\*\*Laboratory analysis may be subject to delay if credit terms are not met

**2. TYPE OF ANALYSIS:** [Bulk-PCM] [Air-PCM] [Lead] [Point Count] [Fungi: AOC, W-C, Bulk, Swab, Tape]

**3. DISPOSAL INSTRUCTIONS:** [Dispose of samples at EMC] [Return samples to me at my expense]

(If you do not indicate preference, EMC will dispose of samples 30 days from analysis.)

**4. Project Name:** BSD - Elmonica E.S. Roof Project

**P.O. Number:** \_\_\_\_\_ **Project Number:** 406451

EMC SAMPLE #	CLIENT SAMPLE #	DATE & TIME SAMPLED	LOCATION/MATERIAL TYPE	Samples Accepted Yes / No	AIR SAMPLE INFO / COMMENTS		
					ON	OFF	FLOW RATE
<u>1</u>	<u>E-01A</u>	<u>8-11-20</u>	<u>See Attached Field Logs</u>	<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
<u>12</u>	<u>E-04C</u>			<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			
				<u>Y N</u>			

**SPECIAL INSTRUCTIONS:**

Sample Collector: (Print) Matt Cudge

(Signature) [Signature]

Relinquished by: [Signature]

Date/Time: 8-11-20 1530

Received by: Diana Federico

Date/Time: 8/12/20 915

Relinquished by: Diana Federico

Date/Time: 8/12/20 415

Received by: [Signature]

Date/Time: 8/12/20 1600

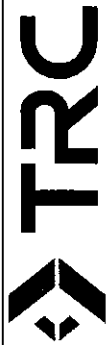
Relinquished by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Received by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

\*\* In the event of any dispute between the above parties for these services or otherwise, parties agree that jurisdiction and venue will be in Phoenix, Arizona and prevailing party will be entitled to attorney's fees and court costs.



4105 SE International Way, Suite 505,  
Milwaukie, OR 97222

## ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM

Client: Beaverton School District		Project Number: 406451	Inspector(s): Matt Cuda
Project Name: BSD - Elmonica Elementary School Roof Project Elmonica Elementary School 16950 SW Lisa Court Beaverton, Oregon 97006		Tracking Number:	Requested TAT: 3 DAY
Email Results to: mcuda@trccompanies.com, rlandolt@trccompanies.com		Analytical Method: PLM EPA 600/R-93/116	Lab Comments:

Date Collected	Sample Identification	Material Description	Homogeneous Area	Sample Location	Lab Identification (Lab Use Only)
2020-08-11	E-01A	Built-up Roofing with Gravel Overlay	Throughout Modular Building Roof	See Diagram - Roof	
2020-08-11	E-01B	Built-up Roofing with Gravel Overlay	Throughout Modular Building Roof	See Diagram - Roof	
2020-08-11	E-01C	Built-up Roofing with Gravel Overlay	Throughout Modular Building Roof	See Diagram - Roof	
2020-08-11	E-02A	Gray Roof Caulking	Throughout Modular Roof	See Diagram - Roof	
2020-08-11	E-02B	Gray Roof Caulking	Throughout Modular Roof	See Diagram - Roof	
2020-08-11	E-02C	Gray Roof Caulking	Throughout Modular Roof	See Diagram - Roof	




1 2 3 4 5 6

241379

Date Collected	Sample Identification	Material Description	Homogeneous Area	Sample Location	Lab Identification (Lab Use Only)
2020-08-11	E-03A	Silver Roof Paint	Throughout Modular Building Roof	See Diagram Roof	
2020-08-11	E-03B	Silver Roof Paint	Throughout Modular Building Roof	See Diagram Roof	
2020-08-11	E-03C	Silver Roof Paint	Throughout Modular Building Roof	See Diagram - Roof	
2020-08-11	E-04A	Black Roof Caulking	Throughout Modular Building Roof	See Diagram Roof	
2020-08-11	E-04B	Black Roof Caulking	Throughout Modular Building Roof	See Diagram Roof	
2020-08-11	E-04C	Black Roof Caulking	Throughout Modular Building Roof	See Diagram Roof	

Special Instruction to Laboratory:

N/A

Relinquished By:	Date	Time	Received By:	Date	Time
I. (Print): Matt Cuda	2020-08-11	14:49:30 PDT	I. (Print): Diana Fedorova	8/12/20	9:15 am
(Sign): 			(Sign): Diana Fedorova		
II. (Print): Diana Fedorova	8/12/20	4pm	II. (Print): 	8/12/20	1:00
(Sign): Diana Fedorova			(Sign): 		

7

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9

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11

12

## **Appendix C – Inspector Certification(s)**



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# ***The Environmental Institute***

---

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## *Matthew Cuda*

---

Social Security Number - XXX-XX-8274

TRC - 4105 SE International Way - Milwaukie, OR 97222

*Has completed 4 hours of coursework and satisfactorily  
passed an examination that meets all criteria required for  
EPA/AHERA/ASHARA (TSCA Title II) Approved Reaccreditation*

### *Asbestos in Buildings: Inspector Refresher*

*January 31, 2020*

Course Date

*17792*

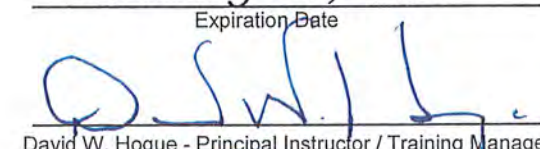
Certificate Number

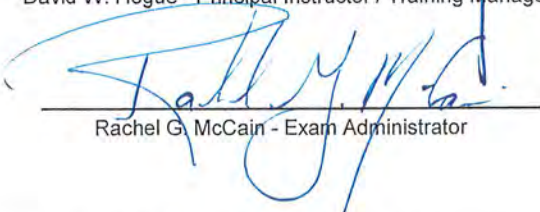
*January 31, 2020*

Examination Date

*January 30, 2021*

Expiration Date

  
David W. Hogue - Principal Instructor / Training Manager

  
Rachel G. McCain - Exam Administrator



(Approved by the ABIH Certification Maintenance Committee for 1/2 CM point - Approval #11-577)

(Florida Provider Registration Number FL49-0001342 - Course #FL49-0002805)

TEI - 1395 S. Marietta Parkway SE - Building 100, Suite 124 - Marietta, GA 30067

Phone: 770-427-3600 - Website: [www.tei-atl.com](http://www.tei-atl.com)

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Miscellaneous steel trim.

### 1.2 SUBMITTALS

#### A. Product Data: For the following:

1. Paint products.

#### B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

## PART 2 - PRODUCTS

### 2.1 METALS, GENERAL

- #### A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

### 2.2 FERROUS METALS

- #### A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- #### B. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- #### C. Steel Tubing: ASTM A 500, cold-formed steel tubing.
- #### D. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

### 2.3 MISCELLANEOUS MATERIALS

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

## 2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- C. 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.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.
- E. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

## 2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

## 2.6 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize exterior miscellaneous steel trim.

## 2.7 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

## 2.8 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.

## 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.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

### 3.2 ADJUSTING AND CLEANING

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

END OF SECTION 055000

## SECTION 061000 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Wood blocking, cants, and nailers.
  - 5. Wood furring.
  - 6. Wood sleepers.

#### 1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. OSB: Oriented strand board.
- E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
  - 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.

## 2.3 DIMENSION LUMBER FRAMING

A. Ceiling Joists: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WHPA.

B. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WHPA.

C. Exposed Framing Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Species and Grade: As indicated above for load-bearing construction of same type.

## 2.4 ENGINEERED WOOD PRODUCTS

A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2600 psi (17.9 MPa for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).

B. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).

Project Number: **20Y082.01**

- C. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055.
  - 1. Web Material: Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
  - 2. Structural Properties: Depths and design values not less than those indicated.
  - 3. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.
- D. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.
  - 1. Manufacturer: Provide products by same manufacturer as I-joists.
  - 2. Material: product made from any combination solid lumber, wood strands, and veneers.
  - 3. Thickness: as indicated.
  - 4. Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Cants.
  - 5. Furring.
- B. Dimension Lumber Items: No. 2 grade lumber of any of the following species:
  - 1. Hem-fir; WCLIB or WWPA.
  - 2. Douglas fir-larch; WCLIB or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
  - 1. Douglas fir-larch; No. 2 grade WCLIB or WWPA
  - 2. Hem-fir No. 2 grade: WCLIB, or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.



**2.6 FASTENERS**

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

**2.7 METAL FRAMING ANCHORS**

- A. Allowable design loads, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  - 1. Use for wood-preservative-treated lumber and where indicated.
- D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304
  - 1. Use for exterior locations and where indicated.

**2.8 MISCELLANEOUS MATERIALS**

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

**PART 3 - EXECUTION****3.1 INSTALLATION, GENERAL**

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- D. Install metal framing anchors to comply with manufacturer's written instructions.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - 2. ICC-ES evaluation report for fastener.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
  - 1. Comply with indicated fastener patterns where applicable.

Project Number: **20Y082.01**

2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### 3.3 INSTALLATION OF WOOD FURRING

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring vertically at 24 inches (610 mm) o.c.

### 3.4 INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

- A. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.5 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 075423 – THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING AND RELATED SHEET METAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Induction welded mechanically attached TPO membrane roofing system.
- B. High density polyiso cover board.
- C. Sheet Metal Flashing and Trim:
  - 1. Formed roof-drainage sheet metal fabrications.
  - 2. Formed low-slope roof sheet metal flashings.
  - 3. Formed wall sheet metal fabrications.
  - 4. Formed equipment support flashings.
  - 5. Sheet metal counter flashing.
- D. Miscellaneous materials.
- E. Preparation of existing roofing system for new recover application.

1.2 REFERENCES

- A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:
  - 1. ASTM D1079, Standard Terminology Relating to Roofing and Waterproofing.
  - 2. The NRCA Roofing and Waterproofing Manual.
  - 3. Roof Consultants Institute, Glossary of Building Envelope Terms.
- B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

1.3 DESIGN CRITERIA

- A. General: Installed roofing membrane system to remain watertight and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials to be compatible with one another under conditions of service and application required and as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Installer to comply with current code requirements based on Authority Having Jurisdiction.

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- D. Wind Uplift Performance: Roofing system to be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.
- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Materials to be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E108, for application and roof slopes indicated.

#### 1.4 SUBMITTALS

##### A. Moisture Mitigation Plan Submittal:

- 1. Contractor shall prepare and submit a 3-part moisture mitigation plan to address potential inclement weather and for District and Architect approval prior to commencement of work. The moisture mitigation plan shall include the following:
  - 2. Part 1: Prevention
    - a. Contractor's protocol for obtaining and reviewing weather forecast during construction and disseminating forecasted weather information and concerns to the Project Team. Include weather forecast source, intervals at which the forecast will be reviewed and the Contractor's method for disseminating forecasted weather-related impacts or concerns to the Project Team.
    - b. Contractor's protocol for weatherizing building at end of each work day.
      - 1) Include a roof plan showing areas where temporary weatherization are to be employed with detailed information of materials and techniques used to achieve temporary weatherization. Provide drawing details as needed to clarify intent and reference details on plan. If re-roof is to be phased, submit requested roof plan for each phase
      - 2) Provide a list of key members of the Construction team involved with end-of-day weatherization and their associated roles and responsibilities (e.g., Those responsible for performing the work, those responsible for overseeing work being performed, those responsible for a quality control check after work is completed, etc)
    - c. Provide list of equipment and where it is to be stored on-site for full project duration and for the sole purpose of deploying during a wet weather emergency to help minimize immediate wet weather affects to unprotected surfaces and affected interior areas.
    - d. Contractor's Action Plan (To be posted in job trailer or other District-approved location): Provide an organized and cohesive Action Plan for addressing wet weather intrusion. A separate Action Plan shall be provided for each of two scenarios:
      - 1) Scenario A: Wet weather is encountered during the workday with appointed staff available to respond immediately.
      - 2) Scenario B: Wet weather is encountered during off-work hours with few or no appointed construction staff on site.

- 3) For each of the above scenarios, include in the Action Plan (at a minimum) the following:
    - a) Response Team: Appoint a wet weather Response Team capable of adequately implementing contractor's Action Plan. This team shall consist of selected Contractor's staff and those of subcontractors as needed at Contractor's discretion. In addition, the District will provide a list of District and School staff to be included as part of the Response Team. Provide a list for each member of the Response Team and include emergency contact information for each, including name, role, phone number and e-mail address. Include in this list and identify at least one member of Contractor's appointed Response Team who can be reached on a 24-hour, seven days-per-week basis.
    - b) Stakeholder Contact List: The District will provide a list of District stakeholders to be contacted in the event of wet weather intrusion into the building for Contractor's integration with the Action Plan.
    - c) Location of dehumidifying equipment, drip buckets, absorbing blankets, moisture absorbing media, etc. to be employed if unprotected exterior surfaces are exposed to moisture and/or if moisture has penetrated the building envelope into the building's interior. Include instructions for locating and operating equipment if required. Refer to Item Part 1.c above for Contractor's list of equipment and materials to be stored on-site.
    - d) Sequence of Operations: Develop a Sequence of Operations for employing the Action Plan, including prioritizing the individuals to be notified upon implementation of the Action Plan and steps required to ensure moisture mitigation measures' effectiveness throughout the course of the wet weather event. As part of this sequence of operations identify the source and contact information for those responsible in supplying additional moisture mitigation equipment and materials if needed to address significant or prolonged wet weather event.
  - e. Contractor's method for educating Contractor and Subcontractor staff of Moisture Mitigation Plan, including Action Plan, and gaging such staff's preparedness to execute the Contractor's Action Plan.
3. Part 2: Immediate Response
    - a. Provide written protocol for implementing Action Plan for both scenarios identified above.
  4. Part 3: Moisture and Mold Mitigation
    - a. Identify Contractor's protocol for quantifying wet weather related impact to exposed exterior surfaces and interior spaces and how Contractor intends to disseminate this information to The District and Architect. Include description of technologies to be employed for moisture detection in concealed and unconcealed locations. Initial verbal notification to the Owner and Architect shall take place within 24 hours of a water intrusion event.

- b. Identify measures to be taken after immediate wet weather event to ensure continued moisture and mold mitigation response. Include Contractor's protocol for drying and/or cleaning of school assets impacted by wet weather, including electronics, books, classroom and office furniture, etc.
  - c. Describe the conditions under which Contractor-provided moisture and mold mitigation equipment and materials/supplies would be disengaged following a wet weather intrusion.
  - d. Provide written confirmation that Contractor intends to work collaboratively with and support an Owner or Architect-contracted industrial hygienist or other moisture and mold mitigation expert. Such subcontractor may be hired at Owner's discretion to help quantify the locations and effects of wet weather related impacts for Contractor remediation.
  - e. Outline Contractor's protocol for wet weather-related clean up.
- B. Product Data: Manufacturer data sheets for each product to be provided.
- C. Roof Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:
  - 1. Base flashings and membrane terminations.
  - 2. Tapered insulation, including slopes.
  - 3. Crickets, saddles, and tapered edge strips, including slopes.
  - 4. Insulation fastening and adhesive patterns.
- D. Tapered Insulation – Shop Drawings: Provide comprehensive panel layout of roof plans and sections as required to identify slopes in regard to hips, valley's, ridges and to all drain locations. Identify thickness of insulation in relation to all applicable existing conditions to include curb mounted equipment, parapet heights, door and structure elevation impacts, potential obstructions and ponding issues.
- E. Sheet Metal Detail Drawings:
  - 1. Include plans, elevations, sections and attachment details.
  - 2. Distinguish between shop and field assembly work.
  - 3. Include identification of finish for each item.
  - 4. Include pattern of seams and details of termination points, expansion joints and expansion joint covers, direction of expansion, roof penetration flashing, and connections to adjoining work.
- F. Verification Samples: Provide for each product specified.
- G. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- H. Maintenance Data for all products installed.
- I. Warranty: Provide manufacturer's current warranty specimen.

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- J. Prior to beginning the work of this section, provide a copy of the final System Assembly Letter issued by the manufacturer indicating that the products and system to be installed will be eligible to receive the specified manufacturer's warranty when installed by a certified contractor/installer in accordance with the manufacturer's application requirements and inspected and approved by a manufacturer's Technical Representative.
- K. Prior to roofing system installation, provide a copy of the Warranty Application Confirmation document issued by the manufacturer indicating that the project has been reviewed for eligibility to receive the specified warranty and is registered.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's warranty with a minimum of five years of experience with work of this type.
- B. Manufacturer Qualifications: Qualified manufacturer that has previous applications for roofing system identical to that used for this Project with a minimum of 10 years of experience providing roofing systems of this type.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E329.
- D. Moisture Survey (Re-cover Roof Areas Only):
  - 1. Submit prior to installation, results of the non-destructive moisture survey test results as performed and completed by RDH Building Science Inc. Moisture Survey to utilize both of the following scanning processes:
    - a. Infrared Thermography Scanning.
    - b. Impedance Scanning.
- E. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system to be labeled by the single source roofing manufacturer issuing the warranty.
- F. Fire-Test-Response Characteristics: Roofing materials to comply with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.



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- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

#### 1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and warranty requirements.

#### 1.8 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer's 25-year total system warranty, No Dollar Limit System Warranty.
  - 1. Single-source special warranty to include roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
- B. Installer Warranty: Submit roofing Installer's warranty for the following period:
  - 1. Warranty Period: 2-years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Johns Manville

#### 2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING MEMBRANE

- A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced.
  - 1. Membrane Thickness: 60-mil (nominal)
  - 2. Exposed Face Color: White

**2.3 AUXILIARY ROOFING MATERIALS – SINGLE PLY**

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  - 1. Liquid-type auxiliary materials to meet VOC limits of Authorities Having Jurisdiction.
- B. Sheet Flashing: Manufacturer's internally reinforced or scrim reinforced, smooth backed membrane with same thickness and color as sheet membrane.
- C. Sheet Flashing (Self-Adhered): 60 mil (1.5 mm) thick, manufacturer's internally reinforced or scrim reinforced with weldable selvage edges on each side of roll, one encapsulated edge and self-adhering capabilities in a wide installation temperature range.
  - 1. Serviceable Installation Substrate Temperature: 20°F (-7°C) and rising.
- D. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
  - 1. Serviceable Installation Ambient Air Temperature: 25°F and rising
- E. Self-Adhered Primer: One-part penetrating primer solution to enhance the adhesion of self-adhering membranes.
- F. Liquid Applied Flashing: Manufacturer's single ply liquid and fabric reinforced flashing system created with a fleece polyester scrim and a two-component polyurethane based liquid applied flashing material, consisting of a liquid resin and a curing agent.
- G. Liquid Applied Flashing Primer: Manufacturer's single ply liquid flashing primer.
- H. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.
- I. Membrane Fasteners and Plates: Factory-coated steel fasteners and galvalume coated steel plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening TPO membrane materials to substrate, and acceptable to membrane roofing system manufacturer. Note: Attachment of TPO membrane and insulation at field of roof areas to be done with TPO Induction Welding Plates, see below description.
  - 1. Induction Welding Plate: Round specially coated galvalume plate with a recessed center and raised flat bonding surface specifically designed for induction welding application.
- J. Miscellaneous Accessories: Provide pourable sealers, primers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, cover strips, and other accessories approved by roofing system manufacturer and required for full installation.

**2.4 WALKWAY PADS**

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer.

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2.5 HIGH-DENSITY POLYISO COVER BOARD

- A. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs. of compressive strength.
  - 1. Thickness: 1/2 inch.
  - 2. R-value: 2.5.

2.6 TAPERED INSULATION AND/OR CRICKETING MATERIALS

- A. Tapered Insulation and/or Cricketing Materials, Where Required: ASTM C1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated on Drawings.

2.7 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- C. Insulation Fasteners and Induction Welding Plates: Factory-coated steel fasteners and galvalume coated steel plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening TPO membrane and insulation materials to substrate, and acceptable to membrane roofing system manufacturer. Note: Attachment of TPO membrane and insulation at field of roof areas to be done with TPO Induction Welding Plates.
  - 1. TPO Induction Welding Plate: Round specially coated galvalume plate with a recessed center and raised flat bonding surface specifically designed for induction welding application.
- D. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate, where required.
- E. Wood Nailer Strips.

2.8 EDGE METAL COMPONENTS

- A. Coping Metal System at Parapet Wall Conditions: Provide manufacturer's factory fabricated metal coping consisting of anchor bar and a snap-on cap components. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit warranty.
- B. All exposed sheet metal flashing to be minimum 24 gauge with Kynar 500 or Hylar 5000. Match existing colors.

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- C. Drip & Rake Edge Metal Components: Provide TPO membrane clad drip and rake edge components where required, including at gutter drip edge conditions. Drip and rake edge components to include a continuous cleat on the outside exterior edge.
- D. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

## 2.9 EXPANSION JOINT COMPONENTS

- A. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product from single-source roofing system supplier that is included in the No Dollar Limit warranty.
- B. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

## 2.10 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, clinch lock, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Roof Drain Strainer Cover: Replace damaged roof drain strainer covers. Replacement covers to be cast iron only.
- C. Fasteners: Wood screws, annular threaded nails, self-tapping screws, bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  - 1. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
  - 2. Fasteners for Zinc Coated (galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.
- D. Solder - For Stainless Steel: ASTM B32, Grade Sn96, with acid flux of type recommended by stainless steel sheet manufacturer.
- E. Butyl Sealant Tape: 100 percent solids, asbestos free, butyl sealant tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch (13 mm) wide and 1/8 inch (3 mm) thick.
  - 1. Manufacturer: Schnee Morehead, Inc.; SM5227 Tacky Tape Sealant.

**PART 3 - EXECUTION****3.1 EXAMINATION GENERAL**

- A. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
- B. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses and elevation height of insulation and/or cover board materials.

**3.2 RECOVER PREPARATION**

- A. Overall Roof Plan Pages and Key Plan: Refer to Drawings, including Key Plan and Overall Roof Plan, for identification of roof related work that falls under this specification.
- B. Existing BUR Roofing System to Remain in Place: Existing roofing system is to remain in place. Existing Roof Core Results: Existing roof system consists of one (1) Tremco BUR roof system with pea-gravel and insulation over plywood roof deck substrate. Maximum thickness is approximately 2-1/2".
- C. Existing Roof Preparation: At all existing roof areas, power broom and remove any loose pea-gravel materials. Using a spud-bar remove any high-spots and make the existing roof substrate relatively smooth prior to the installation of the new cover board materials. Prepare existing roof according to roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer, and requirements in this Section.
- D. Disable Existing Roofing System: Disable existing roof membrane system per manufacturer's written instructions and requirements.
- E. Existing Roof Base Flashings: Tear out, remove, and discard of all existing roof base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of the new cover board and roof membrane system.
- F. Existing Roof System Wet or Damaged Materials: Remove and replace with new any wet and/or compromised existing materials, including any materials identified with moisture per the roof moisture survey results. New infill materials to match the elevation height of the existing roofing system.
- G. Abandoned Equipment and/or Penetrations: Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations. Where necessary, infill and install new plywood roof deck sheathing. New sheathing to match existing.
- H. Existing Equipment Curbs: Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
  - 1. Modify curbs as required to provide a minimum 8-inch base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
  - 2. Secure top of flashing and install new metal counterflashing prior to re-installation of unit.

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- I. Remove Debris Prior to New Roof Installation: Clean and remove from substrate any sharp projections, dust, debris, moisture, and other substances detrimental to new roofing installation and in accordance with roofing system manufacturer's written instructions. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove all debris from roof surface prior to new roof installation. Demolished roof system materials may not be stored on the roof surface.
- J. Unsatisfactory Conditions: Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 TAPERED CRICKET INSULATION INSTALLATION

- A. Protection: Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Tapered Insulation and/or Tapered Cricketing Materials: Where defined on the Drawings, install tapered insulation and/or tapered cricketing materials under area of roofing to conform to slopes indicated. Materials are initially loose laid into position.

### 3.4 COVER BOARD INSTALLATION

- A. Protection: Coordinate installation of membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Polyiso Cover Board, Mechanically Fastened: Mechanically attach cover board using #15 High Load Fasteners or #14 All Purpose Fasteners, and rhino plates. Fastening density of cover board to be 6/10/15 fasteners and rhino plates per 4' x 8' panel at field/perimeter/corner locations.
- D. Staggered Joints Cover Board: Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch with cover board.
  - 1. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations.
- E. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

### 3.5 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.

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- B. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
  - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.6 INDUCTION WELDED TPO ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roofing membrane and allow to relax before installing.
- C. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Apply roofing membrane with side laps shingled with roof slope, where possible.
- E. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
  1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
  2. Verify field strength of seams a minimum of twice daily and repair seam sample areas. Remove and repair any unsatisfactory sections before proceeding with Work.
  3. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.
- F. Induction Welding Installation:
  1. Perform calibration and set-up as detailed by the Induction Welder Owner's Manual
  2. Center the Induction Welder over the first plate in pattern and activate the weld.
    - a. Induction Welder to be centered over the plate to create a 100% bond.
    - b. If an error occurs during activation, refer to the induction welder owner's manual for corrective action.
  3. Prior to every use, clean face of Heat Sink Magnet.
  4. Place Heat Sink Magnet over the welded plate.
    - a. Keep Heat Sink Magnet in place at least 45 seconds while the assembly cools.
  5. Repeat process for each plate.
- G. Perimeter and Corner Membrane Enhancements: Perimeter and corner membrane enhancements are required at all exposed roof edge perimeters and corners.
  1. Formulas for determining dimensions of perimeters and corners are as follows: Use 10% of the lesser plan dimension, or 40% of the roof elevation height, whichever is the lesser.
  2. Use rhino plates and the induction welding process for creating perimeter and corner enhancements.



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- H. At drains, spread sealant or mastic bed over deck drain flange and securely seal roofing membrane in place with clamping ring.

### 3.7 MEMBRANE BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates in accordance with membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### 3.8 DRIP AND RAKE EDGE FLASHINGS:

- A. Drip and Rake Edge Metal Flashings: At drip and rake edge conditions, including where gutter conditions exist, install new TPO membrane clad drip and rake edge metal flashings, where required.
- B. Drip and rake edge materials to incorporate a continuous cleat installed on the outside vertical face.
- C. Flash in and make watertight using 6-inch wide TPO Cover Strip.
- D. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

### 3.9 COPING METAL AT PARAPET WALL CONDITIONS:

- A. At parapet wall conditions where coping metal is required, install new coping metal materials.
- B. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

### 3.10 EXPANSION JOINT INSTALLATION

- A. At top of wall expansion joint conditions where they presently existing, install expansion joint covers; Type TPO EJ/WC Heat Welded.
- B. Install in accordance with manufacturer's written instructions.
- C. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

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3.11 WALKWAY PAD INSTALLATION

- A. TPO Hot-Air Weldable Walkway Pads: Install walkway pads at locations indicated on the Architectural Roof Plan Pages.
- B. Install in accordance with manufacturer's written instructions.

3.12 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Consultant.
  - 1. Notify Consultant or Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.13 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075423



**TECH/NORTHWEST, INC.**

ROOF CONSULTING, MOISTURE TESTING & ANALYSIS

# **ROOF INSPECTION REPORT**

*(Limited Visual Inspection)*

*Conducted For:*

**BEAVERTON SCHOOL DISTRICT**

Beaverton, Oregon

*Facility Inspected:*

**Elmonica Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary**

**Project Number: 20054**

**March 16, 2020**



## ROOF INSPECTION REPORT

(Limited – Visual)

**Inspection Date:** March 16, 2020  
**Project #:** 20054

**Inspection #:** V-01  
**Report Date:** 3/26/20

**Company:** BEAVERTON SCHOOL DISTRICT  
16550 SW Merlo Road  
Beaverton, OR 97003-5152

**Attn:** Megan Finch  
Project Manager  
503-356-4587  
[Megan\\_Finch@beaverton.k12.or.us](mailto:Megan_Finch@beaverton.k12.or.us)

**Inspected Facility:** Elmonico Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary

**Present at Inspection:** Megan Finch..... Beaverton School District  
Patrick Schmautz..... A-Tech/Northwest, Inc.  
Doug Coddington..... A-Tech/Northwest, Inc.

### **PART I - DISCUSSION**

#### **A. PURPOSE:**

1. The purpose of the inspection is to review the existing condition of the roofs at the five (5) schools.
  - a. The available history of the building is minimal. This report is based on the information supplied and this visual inspection.
  - b. One (1) core sample was cut at each school to determine the general roof construction / component data.
2. The following is a summary review of the results of this inspection.

#### **B. GENERAL ROOF/BUILDING INFORMATION:** (Refer to as-built drawings for Roof ID's)

1. Elmonica Elementary School – Modular Building
  - a. Built-up Roofs (Roofs I-DD):
    - (1) Roof Type:..... Pea Gravel Built-up Roof
    - (2) Manufacturer:..... Tremco
    - (3) Insulation:..... 2" Fiberboard (R Value 5 approx.)
    - (4) Deck:..... Plywood
    - (5) Age: ..... 2003 (17 years)
    - (6) Warranty: ..... Unknown
    - (7) Contractor: ..... Unknown
    - (8) General Condition: ..... Fair

2. Errol Hassell Elementary School – Modular Building

a. Built-up Roofs (Roofs I-V):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... Reported to be 2001 or 2009 (*11 or 19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

3. Hiteon Elementary School

a. Built-up Roofs (Roofs A-L):

- (1) Roof Type:..... Pea Gravel Built-up Roof (*Roof-over-roof*)
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... ½" Fiberboard Top Roof (*R Value 1.4 approx.*)  
¾" Perlite Bottom Roof (*R-Value 2 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2004 (*16 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

4. Montclair Elementary School

a. Built-up Roofs (Roofs A-H):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2009 (*11 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

5. Jacob Wismer Elementary School

a. Built-up Roofs (Roofs A-I):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2001 (*19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

### **C. INTERIOR LEAKAGE:**

1. Elmonica Elementary School:
  - a. No current interior leakage reported. Previous interior leakage reported at equipment at a few locations.
2. Errol Hassell Elementary School:
  - a. Current interior leakage at repair area at northeast section of the building. Previous interior leakage reported at a few pipes in the roof field.
3. Hiteon Elementary School:
  - a. No current interior leakage reported.
4. Montclair Elementary School:
  - a. Current interior leakage reported at several locations.
5. Jacob Wismer Elementary School:
  - a. Current interior leakage reported along parapet at southwest section of the building and at west section of the building.

## **PART II - RE-ROOF OPTIONS**

### **A. Single-ply Roof System Types Recommended:** *(in the following order)*

1. Mechanically attached TPO *(minimum 60 mil).*
2. Fully adhered TPO *(minimum 60 mil).*
3. Mechanically attached EPDM *(minimum 60 mil).*
4. Fully adhered EPDM *(minimum 60 mil).*

### **B. Coating:**

1. Coating is **not** recommended for these roofs due to gravel and condition of the existing roofs.

## **PART III – BUDGET ESTIMATE**

### **A. Remove and Replace:**

- |   |                                    |
|---|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 500,000.00 to \$ 550,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 300,000.00 to \$ 350,000.00     |
| 3. Hiteon Elementary School: .....        | \$ 1,260,000.00 to \$ 1,550,000.00 |
| 4. Montclair Elementary School: .....     | \$ 1,100,000.00 to \$ 1,350,000.00 |
| 5. Jacob Wismer Elementary School: .....  | \$ 1,300,000.00 to \$ 1,600,000.00 |

### **B. Recover:**

- |   |                                    |
|---|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 460,000.00 to \$ 490,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 270,000.00 to \$ 290,000.00     |
| 3. Hiteon Elementary School: .....        | n/a <i>(roof-over-roof)</i>        |
| 4. Montclair Elementary School: .....     | \$ 850,000.00 to \$ 1,000,000.00   |
| 5. Jacob Wismer Elementary School: .....  | \$ 1,000,000.00 to \$ 1,200,000.00 |



If you have any questions concerning this inspection and/or the report, please contact our office.  
The opportunity to submit this information is appreciated.

Respectfully submitted,

**A-Tech/Northwest, Inc.**

*Doug Coddington* (electronic)

Doug Coddington, RC/  
Vice President

Attachment: Photo Section  
As-Built Drawings

Copy to: Master Files

**- End of Report -**





**EE. 1.01 – View to south of the front elevation of Elmonica Elementary school.**



**EE. 1.02 – View to northeast of roof top equipment at the north section of roof.**





**EE. 1.03 – View of typical roof drain & overflow scupper with previous repairs starting to fail.**



**EE. 1.04 – View to the south of the upper section of the roof.**





**EE. 1.05 – View to the west of the north section of the roof.**



**EHE. 1.01 – View to south of the front elevation of Errol Hassell Elementary school.**





**EHE. 1.02 – View to the west of the north section of the roof.**



**EHE. 1.03 – View of repair at current interior leakage area at northeast section of the roof.**





**EHE. 1.04 – View of void in the cap of penetration flashing at northeast section of roof.**



**EHE. 1.05 – View of typical roof drain scupper with splits and coating deterioration.**





**EHE. 1.06 – View to northwest of the upper roof areas.**



**HE. 1.01 – View to west of the front elevation of Hiteon Elementary school.**



**HE. 1.02 – View to west at the west section of the roof.**



**HE. 1.03 – View to the west of the southeast section of roof.**





**HE. 1.04 – View of typical roof drain and overflow drain at the east section of the roof.**



**HE. 1.05 – View of typical roof drain and overflow scupper at the northwest section of the roof.**





**HE. 1.06 – View to the west of coated roof system at the covered playground section of roof.**



**ME. 1.01 – View to south of front elevation of Montclair Elementary school.**





**ME. 1.02 – View to east at southwest section of the roof with ponding water and moss build-up.**



**ME. 1.03 – View of typical roof drain and overflow drain with evidence ponding water and moss build-up at the east section of the roof.**





**ME. 1.04 – View to the east at the north section of the roof.**



**ME. 1.05 – View of typical repairs at the east section of the roof.**





**ME. 1.06 – View to west with ponding water and moss build-up along south section of roof.**



**ME. 1.07 – View to the north of northwest roof with evidence of moss build-up.**



**JWE. 1.01– View to north of the front elevation of Jacob Wismer Elementary school.**



**JWE. 1.02– View to north of the southwest section of roof.**





**JWE. 1.03– View of typical wall metal and coping flashing at the southwest section of roof, area has had previous leaks.**



**JWE. 1.04– View of typical roof drain and overflow drain at the west section of the roof.**





**JWE. 1.05– View to the north at the northwest section of roof.**



**JWE. 1.06 – View of fiberglass exposed in membrane at large roof top unit at the northwest section of the roof.**



**JWE. 1.07– View of moss and organic debris on roof at the southeast section of roof area.**

**- End of Photo Section -**

17387-01 25-17 Central SD - Central High School VS - (6) Photo

← SW Lisa Ct →

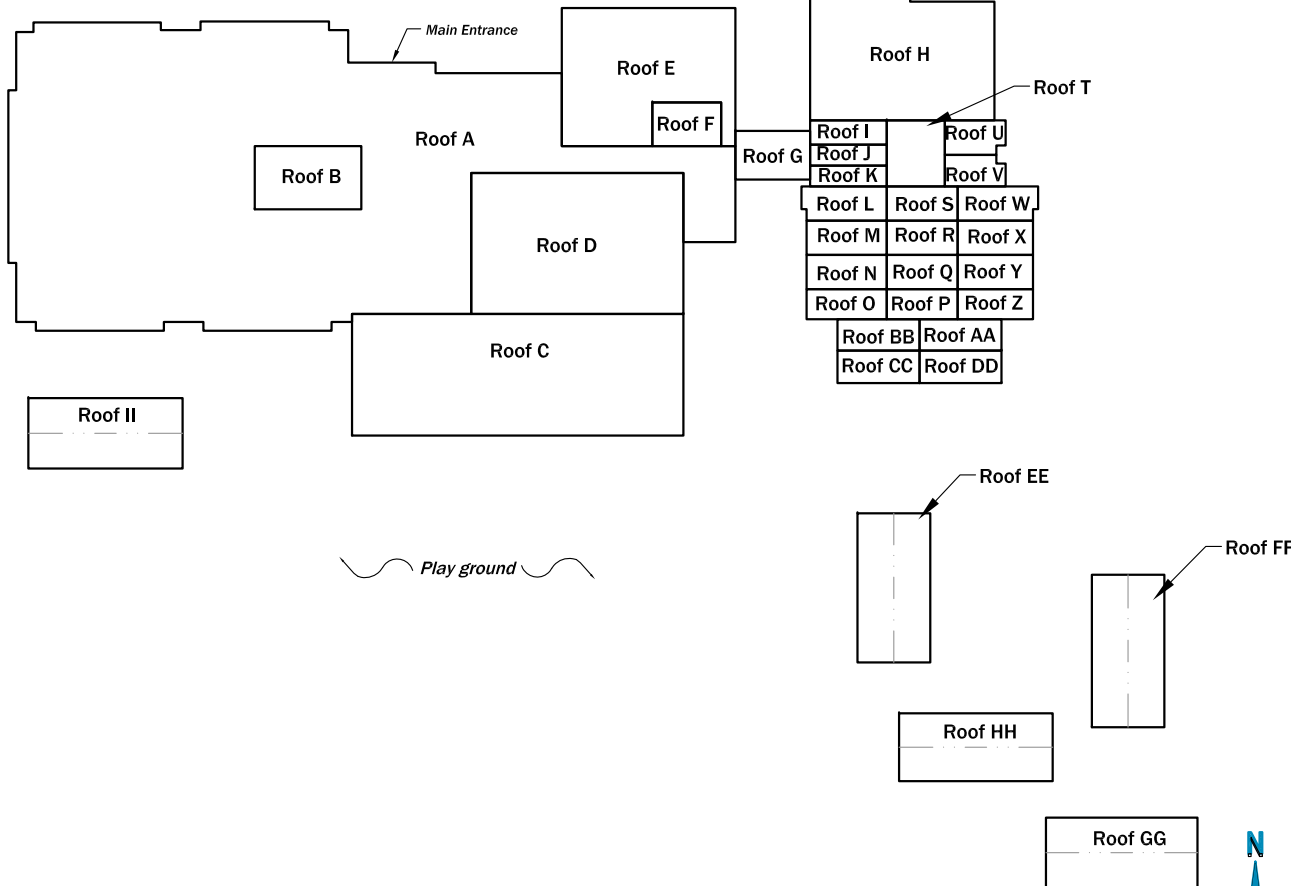
Roof KK

Roof JJ

Parking

Parking

SW 170th Ave



**Single-ply  
ROOF AREA SQ.FT.**  
( Approximate )

Roof A:	26,654 sf
Roof C:	7,470 sf
Roof D:	5,550 sf
Roof E:	3,891 sf
Roof F:	559 sf
Roof G:	673 sf
Roof H:	4,884 sf
<b>Total:</b>	<b>49,681 sf</b>

**Gravel  
ROOF AREA SQ.FT.**  
( Approximate )

Roof B:	1,251 sf
Roof I:	346 sf
Roof J:	298 sf
Roof K:	298 sf
Roof L:	550 sf
Roof M:	509 sf
Roof N:	509 sf
Roof O:	448 sf
Roof P:	396 sf
Roof Q:	450 sf
Roof R:	450 sf
Roof S:	450 sf
Roof T:	713 sf
Roof U:	374 sf
Roof V:	340 sf
Roof W:	499 sf
Roof X:	478 sf
Roof Y:	478 sf
Roof Z:	421 sf
Roof AA:	477 sf
Roof BB:	477 sf
Roof CC:	495 sf
Roof DD:	495 sf
<b>Total:</b>	<b>10,828 sf</b>

**Comp Shingle  
ROOF AREA SQ.FT.**  
( Approximate )


Roof EE:	2,076 sf
Roof FF:	2,110 sf
Roof GG:	1,979 sf
Roof HH:	1,934 sf
Roof II:	2,074 sf
Roof JJ:	1,034 sf
Roof KK:	1,026 sf
<b>Total:</b>	<b>12,233 sf</b>

**Roof Total: 72,742 sf**

**Elmonica Elementary School**  
16950 SW Lisa Ct  
Beaverton, OR



**BEAVERTON SCHOOL DISTRICT**  
**Elmonica Elementary School - Beaverton, OR**

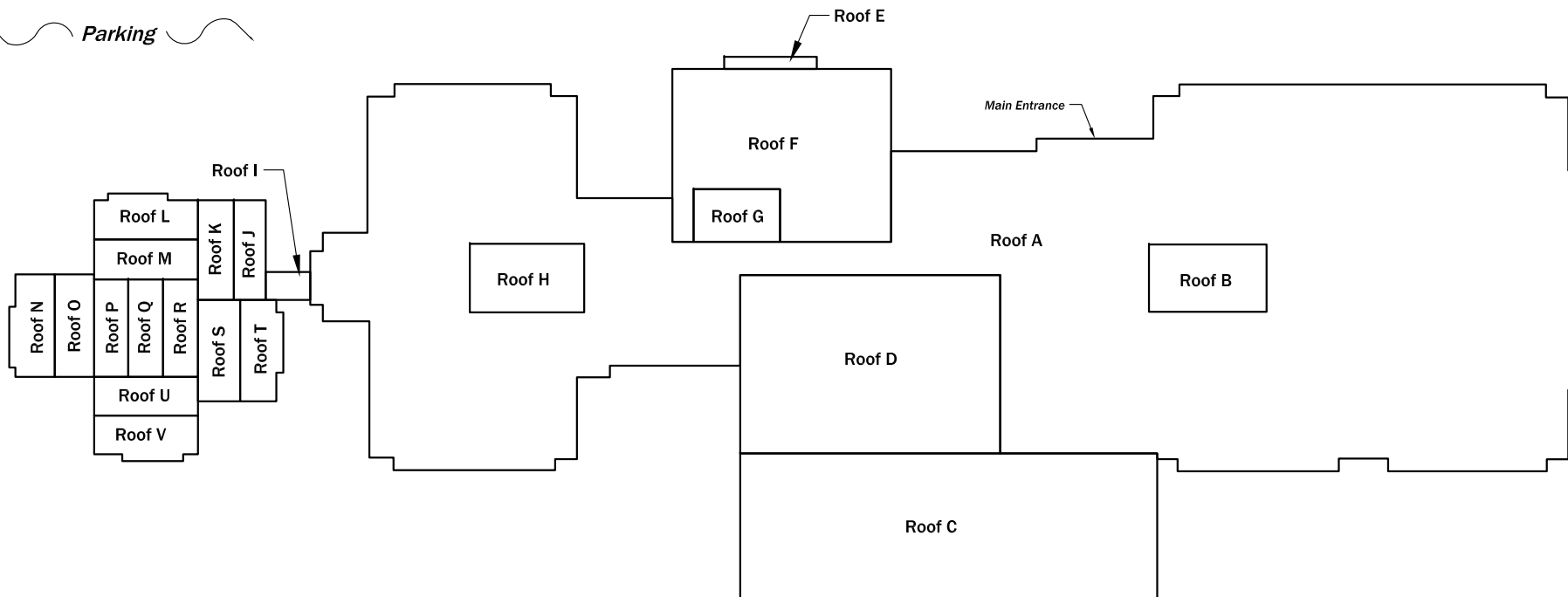
SCALE: NTS	1 of 1	DRAWN BY: D.V.G.
DATE: 3/30/2020		REVISED:
<b>A-TECH/NORTHWEST, INC.</b> Portland & Prineville, Oregon 503-628-2882		
As-Built Drawing		PROJECT NUMBER: 20054



SW Bany Rd

Parking

Parking



Play ground

**Single-ply  
ROOF AREA SQ.FT.  
(Approximate)**

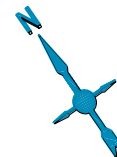
Roof A:	37,808 sf
Roof B:	932 sf
Roof C:	7,178 sf
Roof D:	5,462 sf
Roof E:	133 sf
Roof F:	3,919 sf
Roof G:	537 sf
Roof H:	924 sf
<b>Total:</b>	<b>56,893 sf</b>

**Gravel  
ROOF AREA SQ.FT.  
(Approximate)**

Roof I:	147 sf
Roof J:	375 sf
Roof K:	422 sf
Roof L:	527 sf
Roof M:	487 sf
Roof N:	519 sf
Roof O:	475 sf
Roof P:	391 sf
Roof Q:	400 sf
Roof R:	400 sf
Roof S:	505 sf
Roof T:	481 sf
Roof U:	473 sf
Roof V:	522 sf
<b>Total:</b>	<b>6,124 sf</b>

**Roof Total: 63,017 sf**

**Errol Hassell Elementary School**  
18100 SW Bany Rd  
Beaverton, OR



**BEAVERTON SCHOOL DISTRICT**  
**Errol Hassell Elementary School - Beaverton, OR**

SCALE: NTS	1 of 1	DRAWN BY: D.V.G.
DATE: 3/30/2020		REVISED:

**A-TECH/NORTHWEST, INC.**  
Portland & Prineville, Oregon 503-628-2882

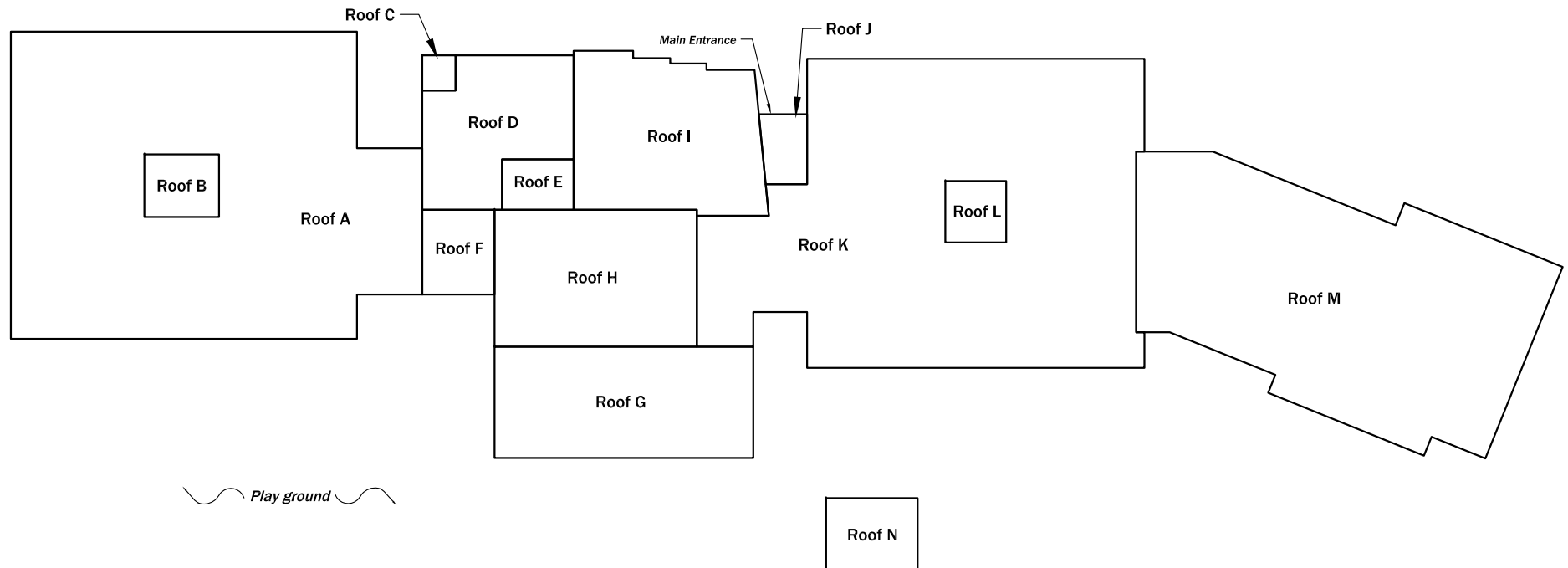


As-Built Drawing

PROJECT NUMBER:  
20054



Parking



Gravel  
ROOF AREA SQ.FT.  
( Approximate )

Roof A:	22,200 sf
Roof B:	936 sf
Roof C:	233 sf
Roof D:	3,709 sf
Roof E:	722 sf
Roof F:	1,223 sf
Roof H:	5,533 sf
Roof K:	22,537 sf
Roof L:	746 sf
Total:	57,839 sf

Single-ply  
ROOF AREA SQ.FT.  
( Approximate )

Roof G:	5,747 sf
Roof I:	5,690 sf
Roof J:	627 sf
Roof M:	16,412 sf
Roof N:	1,330 sf
Total:	29,806 sf

Roof Total: 87,645 sf

Hiteon Elementary school  
13800 SW Brockman Rd  
Beaverton, OR



**BEAVERTON SCHOOL DISTRICT**  
**Hiteon Elementary school - Beaverton, OR**

SCALE: NTS

1 of 1

DRAWN BY: D.V.G.

DATE: 3/30/2020

REVISED:

**A-TECH/NORTHWEST, INC.**  
Portland & Prineville, Oregon 503-628-2882

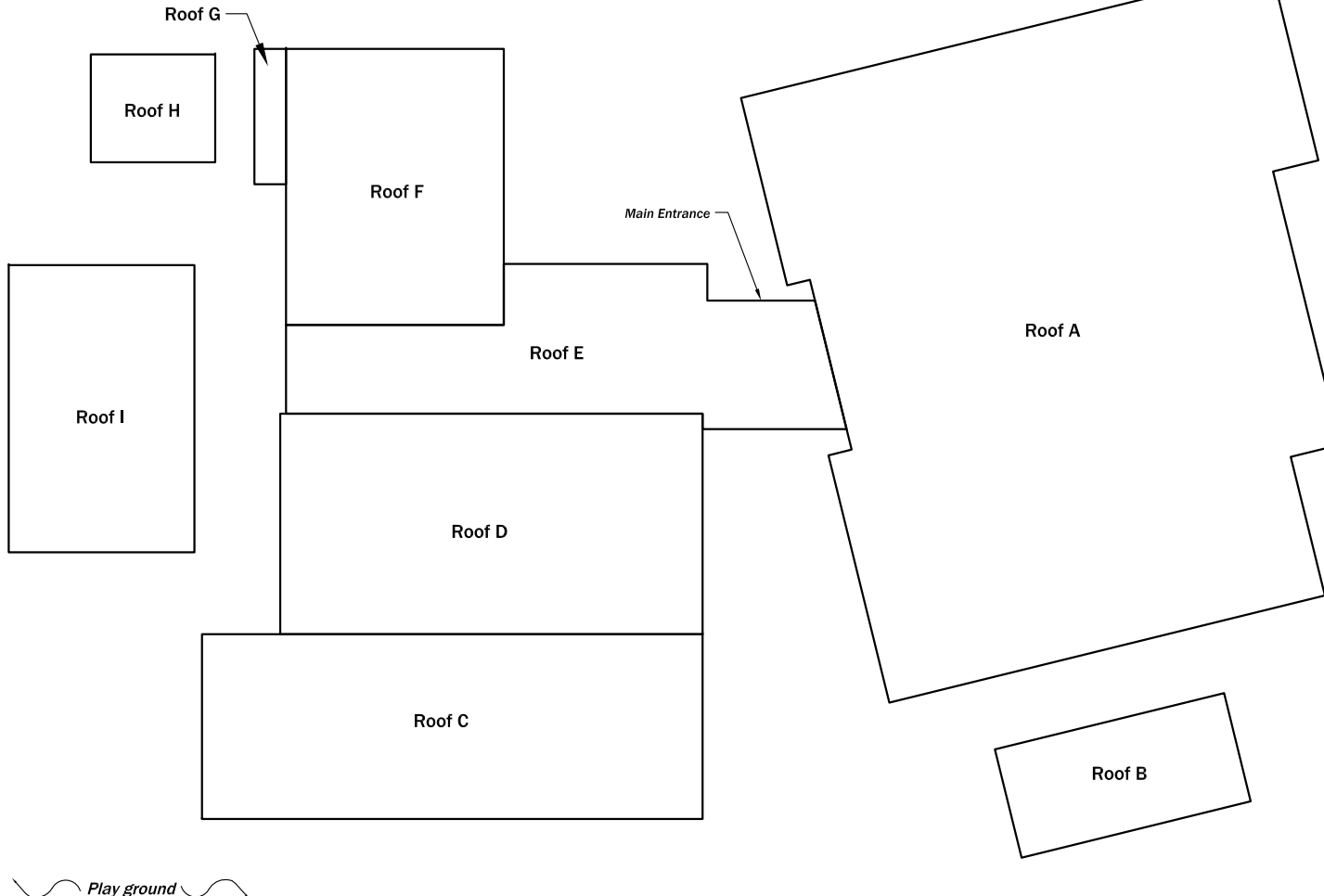


As-Built Drawing

PROJECT NUMBER:  
20054

SW Vermont St →

~~~~~ Parking ~~~~~



**Gravel**  
**ROOF AREA SQ.FT.**  
( Approximate )

|               |                  |
|---------------|------------------|
| Roof A:       | 23,323 sf        |
| Roof B:       | 1,989 sf         |
| Roof C:       | 6,988 sf         |
| Roof D:       | 7,034 sf         |
| Roof E:       | 4,971 sf         |
| Roof F:       | 4,542 sf         |
| Roof G:       | 323 sf           |
| Roof H:       | 1,013 sf         |
| <b>Total:</b> | <b>50,183 sf</b> |

**Single-ply**  
**ROOF AREA SQ.FT.**  
( Approximate )

|         |          |
|---------|----------|
| Roof I: | 4,028 sf |
|---------|----------|

**Roof Total: 54,211 sf**

**Montclair Elementary School**  
**7250 SW Vermont St**  
**Portland, OR**



**BEAVERTON SCHOOL DISTRICT**  
**Montclair Elementary School - Portland, OR**

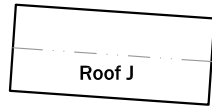
|                 |        |                  |
|-----------------|--------|------------------|
| SCALE: NTS      | 1 of 1 | DRAWN BY: D.V.G. |
| DATE: 3/30/2020 |        | REVISED:         |

**A-TECH/NORTHWEST, INC.**  
Portland & Prineville, Oregon 503-628-2882



**As-Built Drawing**

PROJECT NUMBER:  
**20054**

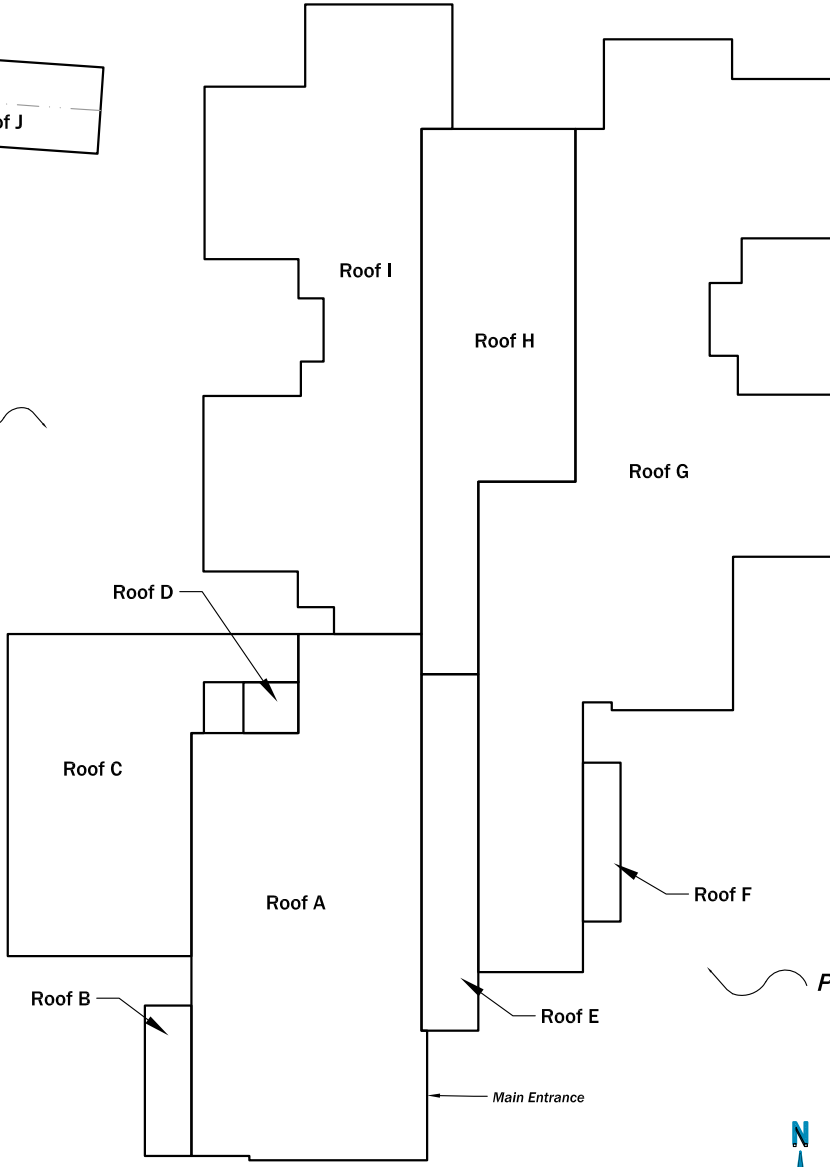


Play ground

Parking

NW Wendy Ln

Parking

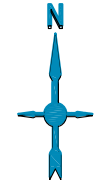


| Gravel<br>ROOF AREA SQ.FT.<br>( Approximate ) |           |
|-----------------------------------------------|-----------|
| Roof A:                                       | 11,574 sf |
| Roof B:                                       | 731 sf    |
| Roof C:                                       | 6,779 sf  |
| Roof D:                                       | 291 sf    |
| Roof E:                                       | 2,111 sf  |
| Roof F:                                       | 622 sf    |
| Roof G:                                       | 19,154 sf |
| Roof H:                                       | 6,804 sf  |
| Roof I:                                       | 11,582 sf |
| Total:                                        | 59,648 sf |

| Comp Shingle<br>ROOF AREA SQ.FT.<br>( Approximate ) |           |
|-----------------------------------------------------|-----------|
| Roof J:                                             | 1,794 sf  |
| Roof Total:                                         | 61,442 sf |

Jacob Wismer Elementary School  
5477 NW Skycrest Pkwy  
Portland, OR

NW Skycrest Pkwy



|                                                                                          |        |                                                                                       |
|------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------------|
| <b>BEAVERTON SCHOOL DISTRICT</b><br><b>Jacob Wismer Elementary School - Portland, OR</b> |        |                                                                                       |
| SCALE: NTS                                                                               | 1 of 1 | DRAWN BY: D.V.G.                                                                      |
| DATE: 3/30/2020                                                                          |        | REVISED:                                                                              |
| <b>A-TECH/NORTHWEST, INC.</b><br>Portland & Prineville, Oregon 503-628-2882              |        |  |
| As-Built Drawing                                                                         |        | PROJECT NUMBER:<br>20054                                                              |



To CIDA  
15895 SW 72<sup>nd</sup> Ave  
Portland, OR 97224

Submitted  
October 12th, 2020  
RDH Building Science Inc.  
5331 S Macadam Avenue #314  
Portland OR 97239



# Contents

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**Appendix A – Photos of Roof Conditions**

**Appendix B - Roof Plan - Impedance Scanning and Cores**

**Appendix C – Roof – IR Scan Results**

**Appendix D – Photos – Roof Cores**





# 1 Project Background

RDH Building Science Inc. (RDH) was retained by CIDA to perform a roof moisture survey on built-up roof systems at four (4) school campuses that are included in the BSD portfolio. BSD is planning a range of different re-roofing efforts for the 2021 summer season. The purpose of the work described in this report is a) to provide verification that existing built-up roof systems are acceptable for re-cover applications and that manufacturers' warranties can be provided, and b) that there are no hidden or unforeseen conditions associated with the existing built-up roof system. This report documents our findings at built-up roof areas of Elmonica Elementary School, located at 16950 SW Lisa Ct, Beaverton, OR 97006. Refer to Figure 1.1 for the extent of roof area surveyed.

This report documents data collection and observations from the roof moisture survey. This report has been undertaken for CIDA on behalf of the BSD and is not to be relied on by others.

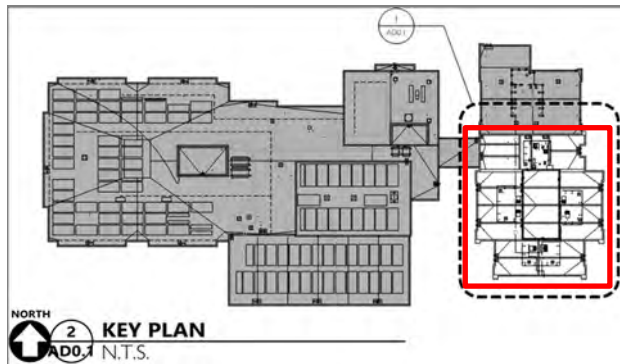


Figure 1.1

*Elmonica Elementary School  
Overall Roof Plan.*

*Roof moisture survey conducted  
on the portion of the roof area  
with a built-up roof system,  
included in this figure where  
grey shading is not.*

## 2 Data Collection

### 2.1 Document Review

The documents provided to and reviewed by RDH are listed in Table 2.1.

| TABLE 2.1 DOCUMENTS REVIEWED                                                                                                                   |                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| DOCUMENT DESCRIPTION                                                                                                                           | DOCUMENT PAGES                               |
| Document Type: Architectural Drawings<br>Title: BSD Elmonica Elementary School: 2021 Re-Roof<br>Author: CIDA<br>Issuance: SD Set on 08/05/2020 | CS1, AD0.1, AD1.1, A1.1,<br>A2.1, A3.1, S1.1 |
| Document Type: Report<br>Title: Roof Inspection Report<br>Author: A-Tech/Northwest, Inc.<br>Dated: 03/06/2020                                  | 1-26                                         |

We note the following relevant information that is related from review of the documents provided:

- The A-Tech/Northwest report indicates that previous interior water leakage was reported adjacent to rooftop equipment in multiple locations.

## 2.2 Historic Information

A history of activities and events including past leakage and repairs relating to the existing roof assembly as reported to us or described in reviewed documents are listed in Table 2.2.

| TABLE 2.2 HISTORIC EVENTS RELATING TO EXISTING ROOF PERFORMANCE |                                                                 |
|-----------------------------------------------------------------|-----------------------------------------------------------------|
| DATE                                                            | EVENT                                                           |
| 1989                                                            | Modular building construction (Test Area)                       |
| 2003                                                            | Tremco built-up roof system installation (Per A-Tech/NW report) |
| March 16, 2020                                                  | Previous leakage reported adjacent to rooftop equipment         |

## 2.3 Field Work

Relevant information pertaining to the field work performed during the roof moisture survey are included in Table 2.3.

| TABLE 2.3 DETAILS OF FIELD WORK                  |                                                  |
|--------------------------------------------------|--------------------------------------------------|
| Dates of Roof Assessment: 2020/09/22, 2020/09/30 |                                                  |
| Impedance Testing                                | Yes                                              |
| Infrared Scanning                                | Yes                                              |
| Test Cuts                                        | Yes                                              |
| Method of Roof Access                            | Ladder & Roof Hatch                              |
| RDH Staff in Attendance                          | Cameron Chorney<br>Shinji Coram<br>Scott Mecalis |
| Other Parties in Attendance                      | Juan Cardoso - Carlson Roofing                   |

## 2.4 Existing Roof System

General information and specific components of the existing roof system, as identified by core sampling, are listed in Table 2.4.

| TABLE 2.4 EXISTING ROOF SYSTEM |                                      |
|--------------------------------|--------------------------------------|
| Roof Age                       | Approximately 17 years               |
| General Roof Assembly          |                                      |
| Deck Type                      | Plywood                              |
| Vapor Barrier                  | Asphalt impregnated roofing felt     |
| Insulation                     | 1" Paper-faced polyisocyanurate      |
| Cover Board                    | ½" Fiberboard                        |
| Roof Membrane                  | Hot-mopped asphalt built-up roofing  |
| Ballast                        | Pea Gravel                           |
| Protection Course              | N/A                                  |
| Means of Drainage              | Internal Drain with Overflow Scupper |
| Approximate Roof Area          | 9,577 Sq. Ft.                        |
| Warranty Available (Y/N)       | No                                   |

## 3 Observations and Field Testing

### 3.1 Visual Observations

We made the following visual observations during our time on site. Refer to Appendix A for photographic examples of the conditions listed below.

- Embedded flashings are located at penetrations, drains, and perimeters and can result in inconsistent impedance readings.
- There are many penetrations through the roof membrane including rooftop mechanical units, vents, drains, and mechanical screen supports. In general, they appear to be detailed properly to provide a watertight interface. We observe failed sealant in some places.
- In general, the roofing membrane is in fair condition.
- We do not observe standing water at any areas. Some areas have moss/organic growth, especially around penetrations at the mechanical areas. Moss/organic growth was cleared to allow impedance scanning in these areas.
- Each low roof section has an internal drain with an overflow scupper. The four high roof areas, have scuppers only that drain onto the adjacent low roof to the west, which increases the moisture load of these lower roofs.
- We do not note staining, cracking, splits, or open lap joints of the roof membrane.
- We marked one air filled blister with paint near a rooftop unit. Refer to Appendix B for the blister location.
- Mechanical equipment curbs are detailed with membrane flashing, metallic paint, and metal flashing.
- Perimeter parapets and curbs separating modular roof areas are detailed with membrane flashing, metallic paint, and standing seam metal coping. Metallic paint is peeling in several locations.

### 3.2 Impedance Scanning

We performed impedance testing in general accordance with ASTM D7954-15a. Refer to Table 2.3 for general information related to field work. Refer to Table 3.1 for information specifically pertaining to impedance testing.

| TABLE 3.1 IMPEDANCE TESTING DETAILS                               |                                                              |
|-------------------------------------------------------------------|--------------------------------------------------------------|
| Date of Impedance Testing                                         | 2020/09/22                                                   |
| Time of Impedance Testing                                         | 0820h to 0945h                                               |
| Ambient Temperature, Relative Humidity, and Dew Point Temperature |                                                              |
| Pre-Testing                                                       | 62 °F, 80 %RH, 56 °F                                         |
| Mid-Testing                                                       | 63 °F, 78 %RH, 56 °F                                         |
| Post-Testing                                                      | 64 °F, 78 %RH, 56 °F                                         |
| Date and Amount of Last Precipitation Event                       | 0.13 inches on 2020/09/19                                    |
| Impedance Scanner Operator and Data Analyst                       | Cameron Chorney                                              |
| Scanner Make, Model and Serial Number                             | Tramex DEC DSAL rolling scanner (Serial Number: DS2 0720292) |

Testing was conducted using Technique A, Continuous Systematic Scanning and Recording, by rolling the DSAL scanner on the roof membrane in a systematic and continuous row-by-row manner when traversing the roof surface. This results in scanning 100% of the roof survey area.

Impedance testing indicated that several areas of insulation and fiberboard below the roof membrane were measured to have elevated electrical conductivity, particularly around the mechanical screen posts, in comparison to adjacent roof areas. Elevated conductivity is an indication of elevated moisture below the membrane.

Refer to Appendix B for a roof plan that shows color coded locations and relative sizes of areas with elevated EMC readings as determined during impedance testing. All elevated EMC readings are color coded red as all reading were above 100% on the scanner's meter. Appendix B also shows the locations of roof openings and scanner calibration.

### 3.3 Infrared Scanning

Due to unfavorable weather conditions at the time of access, we were unable to perform ground based infrared scanning in full accordance with ASTM C1153-10(r15). The scans performed reveal slight temperature anomalies in the roof but do not conclusively indicate an air or moisture leak. Refer to Table 2.3 for general information related to field work. Refer to Table 3.2 for specific information pertaining to infrared scanning.

| TABLE 3.2 INFRARED SCANNING DETAILS                                             |                                  |
|---------------------------------------------------------------------------------|----------------------------------|
| Date of Infrared Scanning                                                       | 2020/09/22                       |
| Time of Infrared Scanning                                                       | 0820h to 0945h                   |
| Ambient Temperature, Wind Velocity and Cloud Cover at Time of Infrared Scanning |                                  |
| 63 °F, 7 mph, Full Cloud Coverage                                               |                                  |
| Precipitation and Cloud Cover In 24 Hours Prior to Infrared Scanning            |                                  |
| 0 inches, Full Cloud Coverage                                                   |                                  |
| Infrared Camera Make and Model                                                  | Fluke Ti401 PRO handheld camera  |
| Camera Lens                                                                     | Fluke Wide Angle Smart Lens      |
| Camera Spectral Range                                                           | 7.5 µm to 14 µm (micro-meter)    |
| Camera Operator and Data Analyst                                                | Cameron Chorney and Shinji Coram |

Infrared scanning was performed by making passes approximately 10-15 feet wide. 60% of the roof area is reviewed. Infrared scanning indicated that some areas of the roof were measured to have slightly elevated temperatures (0 to 1 degrees warmer) in comparison to adjacent roof areas. For scans taken during the day at a ballasted roof such as found at Elmonica, the test standard requires the exterior temperature to be 32°F (18°C) cooler than the interior. However, as the exterior temperature was only 9 degrees colder than the interior temperature (72°F) at the time of the survey, scans taken were not able to confirm or deny the existence of air or moisture trapped in the roof assembly. As the areas of elevated temperature were less than 1 degree warmer than the surrounding area, they do not conclusively indicate subsurface air or moisture as the heating and cooling effects of the sun and wind play a larger factor when scans are taken during the day.

Refer to Appendix C for the IR images taken during infrared scanning.

## 4 Roof Openings

Both ASTM D7954-15a and C1153-10(r15) require that test openings be made into the roof assembly. These openings provide verification results to quantify the actual moisture content found between membrane layers and within insulation.

With the assistance of Carlson Roofing, we conducted seven roof core samples at suspected areas of moisture as indicated by impedance scans. Core sample specimens of insulation, fiberboard, and membrane having a minimum of 2-in. diameter were obtained by cutting through these components down to the plywood deck and removing them from the roofing section under test. All cores sample specimens show signs of moisture present within the roof assembly. We observed the plywood roof deck sheathing to be in good condition at all core samples.

Refer to Appendix C for photographic documentation from roof test openings described above and Appendix B for locations and the moisture findings that are combined with the Impedance scan results.

## 5 Summary of Testing

Impedance testing confirm that several areas of the roof are measured to have elevated subsurface moisture. This testing verifies the need to prioritize re-roofing within the next 1-2 years. Our testing, document review and visual observations confirm the roof is generally in fair condition. We recommend planning for re-roofing in approximately 1-2 years, reliant on continued deterioration and continued maintenance of the roof assembly.

We understand that BSD and CIDA are planning re-roofing at Elmonica in 2021 and the scope of work currently consists of removing the ballast and providing new coverboard and a new single-ply roof system over the existing roof system. The areas with subsurface moisture need to be addressed prior to or as part of this work to avoid trapping moisture within the assembly. If left unaddressed, the trapped moisture may void the manufacturer's warranty of the new roof system.

## 6 Closure

We appreciate the opportunity to work with CIDA. Please do not hesitate to contact the writer with any questions or to discuss next steps.

Yours truly,



**Cameron Chorney | BASc, CDT**  
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Reviewed by  
**Scott Mecalis | RA(WA), CSI, CDT**  
Senior Project Architect  
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**RDH Building Science Inc.**

encl.

Appendix A – Photos of Roof Conditions

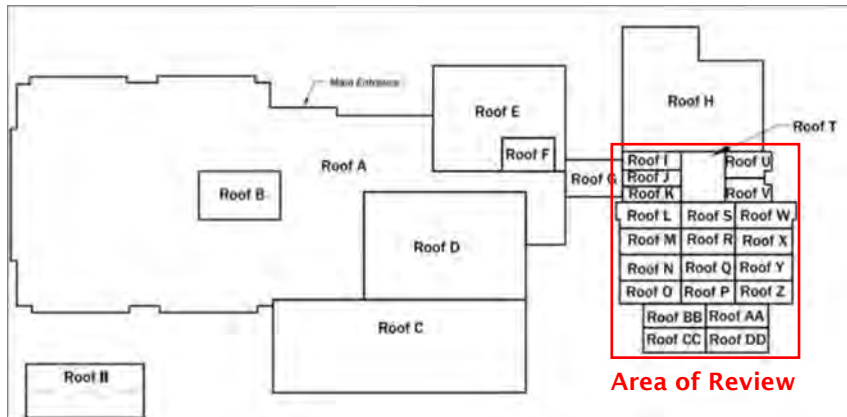
Appendix B - Roof Plan - Impedance Scanning and Cores

Appendix C – Roof – IR Scan Results

Appendix D – Photos – Roof Cores

# Appendix A

## Photos of Roof Conditions



*Figure A.1*  
Overall roof plan with area of moisture survey identified in red.



*Figure A.2*  
View of roof as viewed from the west end looking east.





*Figure A.3*  
*View of north mechanical*  
*area, looking north.*



*Figure A.4*  
*Typical vent penetration.*



*Figure A.5*  
*Typical mechanical screen support with painted lead skirt flashing.*



*Figure A.6*  
*Thin/failed sealant at mechanical screen support at area #7*





*Figure A.7*

*Minor amount of organic growth and debris around mechanical screen support. Organic growth and debris removed to allow testing.*



*Figure A.8*

*Typical roof drain and overflow scupper. Each drain area measures approximately 10" wide. Scuppers measure 3"x7".*



*Figure A.9*

*Typical scupper at upper roof section. Scuppers measure 7"x11".*

# Appendix B

## Roof Plan - Impedance Scanning and Cores



## Appendix B - Impedance Scan Map

**Legend**

- [C#] Calibration Point
- # Moisture Detected - ID # & Extent
- B Air Bubble/Blister
- P Ponding Water
- X Core Location
- No Review

High Roof Areas

Core #7  
Built-up roofing membrane  
1/2" fiberboard - moist, deterioration  
1" paper faced polyiso - moist  
Bitumen impregnated felt vapor retarder  
Plywood - moist, 23.2% MC, good condition

Core #6  
Built-up roofing membrane  
1/2" fiberboard - moist, deterioration  
1" paper faced polyiso - moist  
Bitumen impregnated felt vapor retarder  
Plywood - moist, 12.3% MC, good condition

Core #5  
Built-up roofing membrane  
1" paper faced polyiso - moist  
Bitumen impregnated felt vapor retarder  
Plywood - moist, 25.7% MC, good condition  
\*Fiberboard not identified or severely deteriorated

Core #1  
Built-up roofing membrane  
1/2" fiberboard - moist, deterioration  
1" paper faced polyiso - moist  
Bitumen impregnated felt vapor retarder  
Plywood - moist, 13.6% MC, good condition

Core #2  
Built-up roofing membrane  
1/2" fiberboard - moist, deterioration  
1" paper faced polyiso - moist  
Bitumen impregnated felt vapor retarder  
Plywood - 12.4% MC, good condition

Core #3  
Built-up roofing membrane  
1/2" fiberboard - moist  
1" paper faced polyiso - moist  
Bitumen impregnated felt vapor retarder  
Plywood - moist, 14.4% MC, good condition

Core #4  
Built-up roofing membrane  
1/2" fiberboard - moist  
1" paper faced polyiso - moist  
Bitumen impregnated felt vapor retarder  
Plywood - moist, 12.7% MC, good condition

NORTH



EXISTING COND. ROOF PLAN

1/8" = 1'-0"

# Appendix C

## Roof - IR Scan Results

## Appendix C – IR Scan Results

Infrared (IR) scanning was conducted in general accordance with ASTM C1153-10(r15). Due to scheduling and weather constraints, measurements were not able to be taken at night as recommended by the test standard. Scanning was performed by making passes approximately 10-15 feet wide. 60% of the roof area is reviewed. Infrared scanning indicated that some areas of the roof were measured to have slightly elevated temperatures (0 to 1 degrees warmer) in comparison to adjacent roof areas. For scans taken during the day at a ballasted roof such as found at Elmonica, the test standard requires the exterior temperature to be 32°F (18°C) cooler than the interior. However, as the exterior temperature was only 9 degrees colder than the interior temperature (72°F) at the time of the survey, scans taken were not able to confirm or deny the existence of air or moisture trapped in the roof assembly. As the areas of elevated temperature were less than 1 degree warmer than the surrounding area, they do not necessarily indicate subsurface air or moisture as the heating and cooling effects of the sun and wind play a larger factor when scans are taken during the day.

| TABLE C.1 GENERAL INFORMATION |                               |
|-------------------------------|-------------------------------|
| Interior Temperature          | 72 °F                         |
| Exterior Temperature          | 63 °F                         |
| Wind speed                    | 7 mph                         |
| Cloud Cover                   | Heavy                         |
| Camera Make/Model             | Fluke Ti401 PRO               |
| Lens                          | Fluke Wide Angle Smart Lens   |
| Emissivity                    | 0.95                          |
| Background Temperature        | 71.60 °F                      |
| Spectral Range                | 7.5 µm to 14 µm (micro-meter) |
| Calibration Range             | -4.00 °F to 212.00 °F         |
| IR Sensor Size                | 640x480                       |
| Camera Operator               | Shinji Coram                  |



| TABLE C.2 ROOF IR IMAGES                                                            |                                                                                      |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |



TABLE C.2 ROOF IR IMAGES

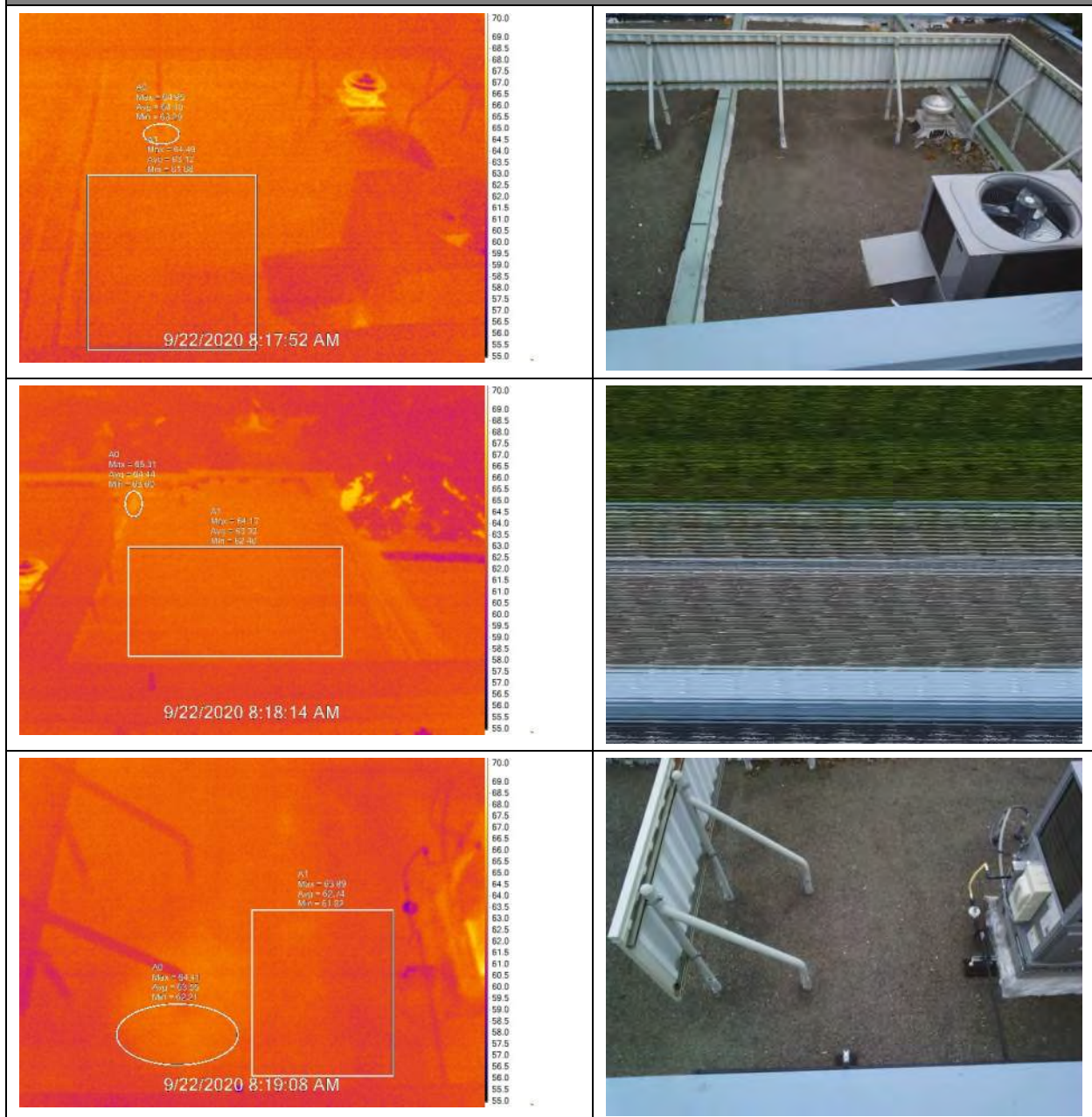


TABLE C.2 ROOF IR IMAGES

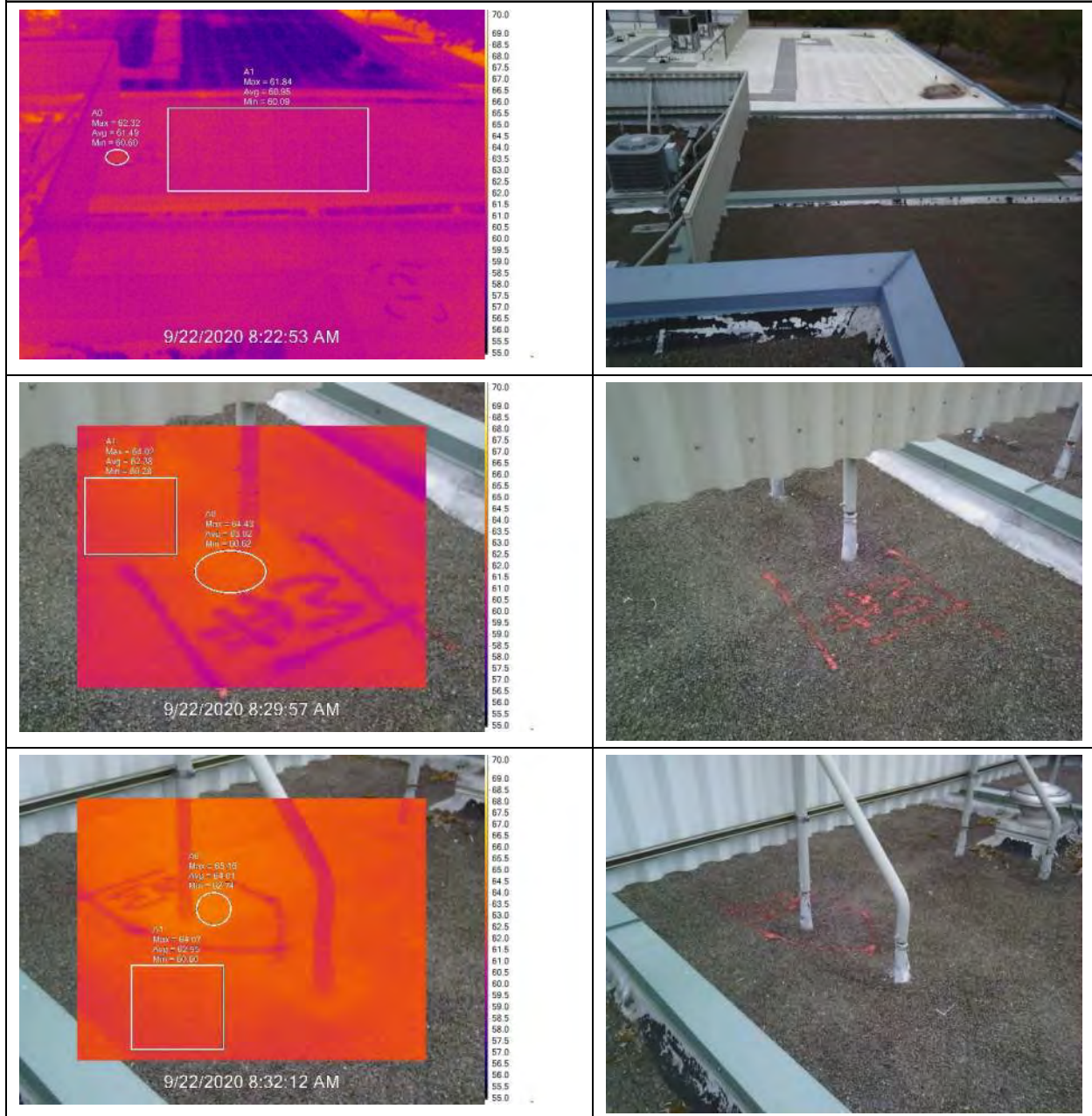
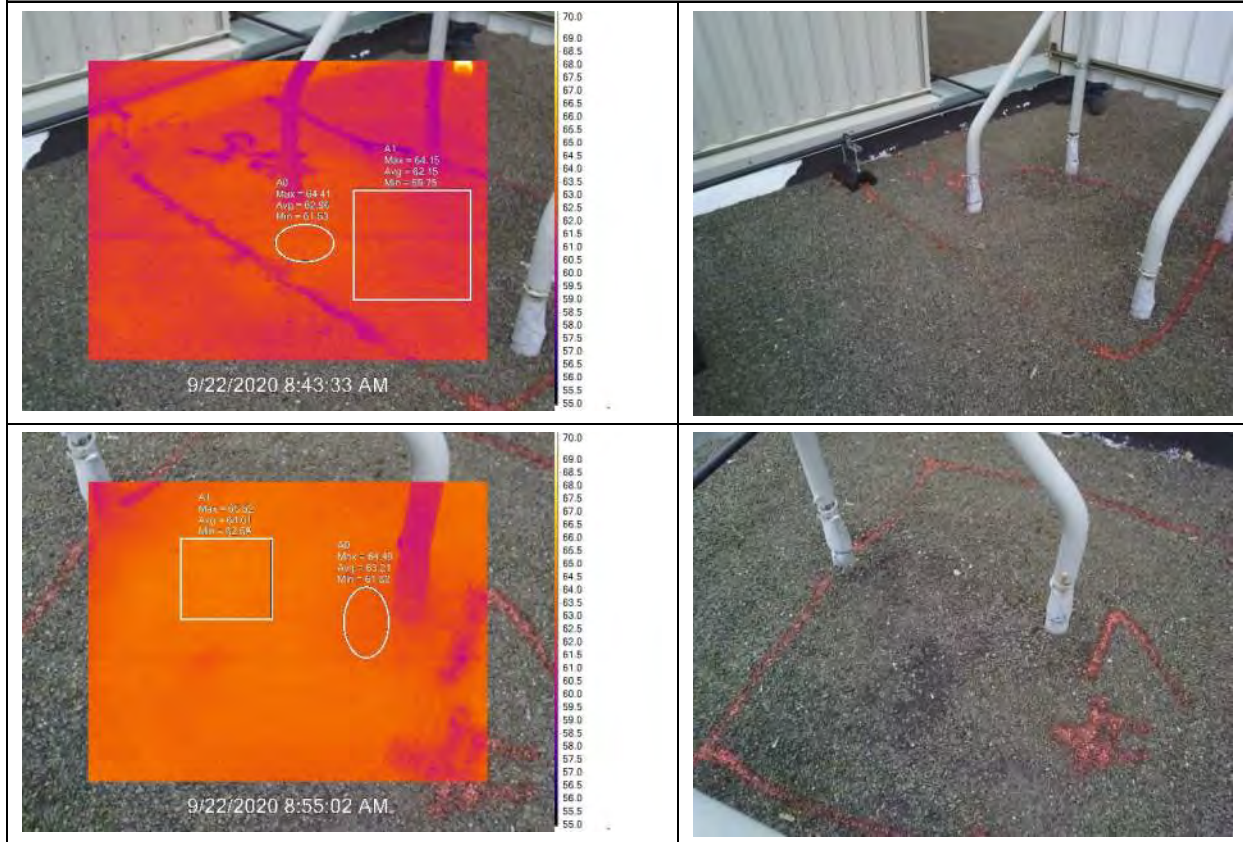




TABLE C.2 ROOF IR IMAGES



# Appendix D

Photos - Roof Cores

## Appendix D - Roof Core Photos

### 1.1 Core #1



*Figure D.1*  
*Core #1 within moisture*  
*location #1.*



*Figure D.2*  
*Moisture present within*  
*polyiso insulation.*



*Figure D.3*

*Moisture present within fiberboard. Deterioration noted.*



*Figure D.4*

*Moisture present on the exterior surface of the plywood deck. Plywood deck is in good condition.*





*Figure D.5*

*Moisture reading is conducted with a Tramex CMXpert II moisture meter with an insulated pin probe attachment. MC of 13.6% recorded at the plywood deck.*

## **1.2 Core #2**



*Figure D.6*

*Electric impedance reading indicates high moisture content within roof assembly at location of core #2 within moisture location #2.*



*Figure D.7*  
*Typical roof assembly.*  
 ½" BUR membrane  
 ½" fiberboard  
 1" paper-faced Polyiso  
 Asphalt impregnated felt  
 vapor retarder  
 Plywood deck



*Figure D.8*  
*Moisture present within  
 polyiso insulation.*





*Figure D.9  
Fiberboard deterioration  
noted.*



*Figure D.10  
MC of 12.4% recorded at the  
plywood deck. Plywood deck is  
in good condition.*

### 1.3 Core #3



*Figure D.11*

*Electric impedance reading indicates high moisture content within roof assembly at location of core #3 within moisture location #3.*



*Figure D.12*

*Moisture present within polyiso insulation.*





*Figure D.13*  
*Moisture present within*  
*fiberboard.*



*Figure D.14*  
*MC of 14.4% recorded at*  
*plywood deck.*



*Figure D.15*

*Moisture present on the exterior surface of the plywood deck. Plywood deck is in good condition.*

#### **1.4 Core #4**



*Figure D.16*

*Electric impedance reading indicates high moisture content within roof assembly at location of core #4 within moisture location #6.*





*Figure D.17*

*Moisture present within polyiso insulation and fiberboard.*



*Figure D.18*

*Moisture present on the exterior surface of the plywood deck. Plywood deck is in good condition.*



Figure D.19  
MC of 12.7% recorded at  
plywood deck.

## 1.5 Core #5



Figure D.20  
Electric impedance reading  
indicates high moisture  
content within roof assembly  
at location of core #5 within  
moisture location #7.





*Figure D.21*

*Atypical roof assembly present. Fiberboard is not present or severely deteriorated.*

*½" BUR membrane*

*1" paper-faced Polyiso*

*Asphalt impregnated felt vapor retarder*

*Plywood deck*



*Figure D.22*

*Moisture present on the exterior surface of the plywood deck. Plywood deck is in good condition.*



*Figure D.23*  
*MC of 25.4% recorded at*  
*plywood deck.*

## 1.6 Core #6



*Figure D.24*  
*Electric impedance reading*  
*indicates high moisture*  
*content within roof assembly*  
*at location of core #6 within*  
*moisture location #12.*





*Figure D.25*

*Moisture present within fiberboard. Fiberboard deterioration present.*



*Figure D.26*

*Moisture present within polyiso insulation.*



*Figure D.27*

*Moisture present on the exterior surface of the plywood deck. Plywood deck is in good condition.*



*Figure D.28*

*MC of 12.3% recorded at plywood deck.*



## 1.7 Core #7



*Figure D.29*

*Electric impedance reading indicates high moisture content within roof assembly at location of core #7 within moisture location #10.*



*Figure D.30*

*Moisture present within fiberboard. Fiberboard deterioration present.*



*Figure D.31*

*Moisture present within  
polyiso insulation.*



*Figure D.32*

*Moisture present on the  
exterior surface of the  
plywood deck. Plywood deck is  
in good condition.*



Figure D.33  
MC of 23.2% recorded at  
plywood deck.



# BSD 2021 Roofing Projects – Errol Hassell ES

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## TECHNICAL SPECIFICATIONS



PROJECT NUMBER: 20Y082.02

BID SET: OCTOBER 28, 2020



**AIA DOCUMENT A101-2017** *STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR*

- (INCORPORATED BY REFERENCE)

**AIA DOCUMENT A201-2017** *GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION*

- (INCORPORATED BY REFERENCE)

**BSD TECHNICAL STANDARDS** STANDARDS FOR DESIGN AND CONSTRUCTION OF ALL DISTRICT FACILITIES

- (INCORPORATED BY REFERENCE—PLEASE SEE WEBSITE)

<https://www.beaverton.k12.or.us/departments/facilities-development/technical-standards>

**DIVISION 0 PROCUREMENT AND CONTRACTING REQUIREMENTS**

|        |                   |
|--------|-------------------|
| 000110 | Table of Contents |
| 000115 | List of Drawings  |
| 000120 | Project Team      |

**DIVISION 1 GENERAL CONDITIONS**

|        |                                          |
|--------|------------------------------------------|
| 011000 | Summary                                  |
| 012200 | Unit Prices                              |
| 012300 | Alternates                               |
| 012500 | Substitution Procedures                  |
|        | Substitution Request Form: CSI Form 1.5C |
| 013100 | Project Management And Coordination      |
| 013123 | Project Management Database (E-Builder)  |
| 013200 | Construction Progress Documentation      |
| 013300 | Submittal Procedures                     |
| 013553 | Security Procedures                      |
| 014000 | Quality Requirements                     |
| 014200 | References                               |
| 015000 | Temporary Facilities And Controls        |
| 016100 | Common Product Requirements              |
| 017300 | Execution                                |
| 017329 | Cutting And Patching                     |
| 017700 | Closeout Procedures                      |
|        | Closeout Log Template                    |
| 017823 | Operation And Maintenance Data           |
| 017839 | Project Record Documents                 |
| 017900 | Demonstration And Training               |

**DIVISION 2 EXISTING CONDITIONS** (See APPENDIX 'A': ROOF INSPECTION REPORT')

|        |                                             |
|--------|---------------------------------------------|
| 022623 | Limited Supplemental Asbestos Survey Report |
|--------|---------------------------------------------|

**DIVISION 3 CONCRETE** (NOT USED)

**DIVISION 4 MASONRY (NOT USED)**

**DIVISION 5 METALS (NOT USED)**

**DIVISION 6 WOOD, PLASTICS, AND COMPOSITES**

061000 Rough Carpentry

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**

075423 Thermoplastic Polyolefin (TPO) Membrane Roofing

**DIVISION 8 OPENINGS (NOT USED)**

**DIVISION 9 FINISHES (NOT USED)**

**APPENDIX A: ROOF INSPECTION REPORT**

- By A-Tech Northwest, Inc. dated 03/26/2020

**APPENDIX B: MOISTURE SURVEY REPORT**

- By RDH Building Science. dated 10/14/2020

END OF SECTION



Project Number: **20Y082.01**

## **LIST OF DRAWINGS**

CS1 COVER SHEET  
AD0.1 EXISTING CONDITIONS ROOF PLAN  
AD1.1 DEMO ROOF PLAN  
A1.1 ROOF PLAN  
A2.1 FALL PROTECTION PLAN  
A3.1 DETAILS  
A3.2 DETAILS  
  
S1.1 STRUCTURAL ROOF PLAN  
  
M0.1 MECHANICAL LEGEND, SCHEDULES AND DETAILS  
M1.1 ROOF PLAN-MECHANICAL  
M2.1 MECHANICAL SPECIFICATIONS  
M2.2 MECHANICAL SPECIFICATIONS

Project Number: **20Y082.01**

## **PROJECT TEAM**

### OWNER

Beaverton School District

16550 SW Merlo Rd

Beaverton, OR 97003

Contact: Megan Finch, Project Manager

E-Mail: [megan\\_finch@beaverton.k12.or.us](mailto:megan_finch@beaverton.k12.or.us)

Phone: (503) 356-4318

Contact: Angela Knotts, Project Coordinator

E-Mail: [angela\\_knotts@beaverton.k12.or.us](mailto:angela_knotts@beaverton.k12.or.us)

Phone: (503) 356-4576

### ARCHITECT/ STRUCTURAL ENGINEER

CIDA

15895 SW 72<sup>ND</sup> Ave, Suite 200

Portland, OR 97224

Contact: Dustin Johnson

E-Mail: [dustinj@cidainc.com](mailto:dustinj@cidainc.com)

Phone: (503) 226-1285

Contact: Curtis Gagner

E-Mail: [curtisg@cidainc.com](mailto:curtisg@cidainc.com)

Phone: (503) 226-1285

### MECHANICAL/ ELECTRICAL ENGINEER & COST CONSULTANT

R&W Engineering, Inc.

9615 SW Allen Blvd, Suite 107

Beaverton, OR 97005

Contact: Ed Carlisle

E-Mail: [ecarlisle@rweng.com](mailto:ecarlisle@rweng.com)

Phone: (503) 726-3322

### ROOFING CONSULTANT

RDH Building Science

5331 S Macadam Ave. #314

Portland, OR 97239

Contact: Kathleen Smith

E-mail: [ksmith@rdh.com](mailto:ksmith@rdh.com)

Phone: (503) 821-7321

Contact: Scott Mecalis

E-Mail: [smecalis@rdh.com](mailto:smecalis@rdh.com)

Phone: (503) 867-8519

### HAZARDOUS MATERIAL SURVEYOR

TRC Solutions

4105 SE International Way

Milwaukie, OR 97222

Contact: Ron Landolt

E-Mail: [rlandolt@trcsolutions.com](mailto:rlandolt@trcsolutions.com)

Phone: (503) 387-3251

Project Number: **20Y082.01**

GENERAL CONTRACTOR

TBD

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

#### B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

### 1.2 PROJECT INFORMATION

#### A. Project Identification: BSD 2021 Roofing Projects: Errol Hassell Elementary School

1. Project Location: 18100 SW Bany Rd, Beaverton, OR

### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

#### A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. New roofing overlay over existing build-up roofing system at modular classrooms and library. Project includes new mechanical units to replace existing gas packs.

#### B. Type of Contract.

1. Project will be constructed under a single prime contract.
  - a. *Standard Form of Agreement Between Owner and Contractor AIA Document A101, 2017 Edition Modified.*
  - b. *General Conditions of the Contract for Construction AIA Document A201, 2017 Edition Modified.*

### 1.4 ACCESS TO SITE

- #### A. General:
- Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

Project Number: **20Y082.01**

- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

## 1.5 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
  - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
  - 3. Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

## 1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
  - 2. Comply with noise ordinances of the authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building and site as follows:
  - 1. Weekdays: 7:00 a.m. to 7:00 p.m (Custodian until 3:30 p.m.).
  - 2. Saturdays and Sundays: Arrange with Owner's Representative
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
  - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products, E-cigarettes/vape devices and other controlled substances on the Project site is not permitted.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Section:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

### 1.2 DEFINITIONS

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

### 1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. Schedule:
  - 1. A "Schedule of Unit Prices" is included at the end of this section.
  - 2. Include as part of each unit price, miscellaneous devices, appurtenances and similar items incidental to or required for a complete system whether or not mentioned as part of the unit price.



Project Number: **20Y082.01**

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 Schedule of Unit Prices:

A. New Sheet Metal Fabrications at Roof Edge Conditions

1. New 24 ga. pre-finished sheet metal gutter and downspouts (Unit: Cost per lineal foot)
2. New 24ga. pre-finished sheet metal coping cap (Unit: Cost per lineal foot)

B. Roof Sheathing Replacement at Roof Overlay Areas

1. Roof sheathing replacement at areas discovered during construction to be damaged or rotted. This item includes roof sheathing found to be rotted or damaged as a result of physical investigation. For the purpose of this unit price item, assume up to 654 square feet of sheathing to be replaced.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

### 1.2 DEFINITIONS

- A. Alternate: An amount proposed by the Contractor in Bid Proposal, including 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.
  - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

### 1.3 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section.

Project Number: **20Y082.01**

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate #1: Replace existing gas pack HVAC units within area of work (6 units total). Include new insulated equipment curb to replace existing at each unit. See mechanical drawings for full scope of work to be incorporated with this alternate.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

### 1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

### 1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Architect to forward any substitution to BSD representative for approval prior to acceptance by the Architect.
  - 1. Substitution Request Form: Use CSI Substitution Request Form 1.5C provided at the end of this section.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Certificates and qualification data, where applicable or requested.
    - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
    - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided

within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 fifteen days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
  - a. Requested substitution has been approved by the Owner.
  - b. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - e. Requested substitution is compatible with other portions of the Work.
  - f. Requested substitution has been coordinated with other portions of the Work.
  - g. Requested substitution provides specified warranty.
  - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed.

## PART 3 - EXECUTION (Not Used)

END OF SECTION



# 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 ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ \_\_\_\_\_

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination drawings.
  - 2. Requests for Information (RFIs).
  - 3. Project Web site.
  - 4. Project meetings.

### 1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, Consultant or Contractor seeking information from each other during construction.

### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.



6. Preinstallation conferences.
7. Project Closeout Conference.
8. Startup and adjustment of systems.
9. Project closeout activities.

#### 1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
  1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
  1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing and electrical Work.
  2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Review: Architect/Consultant will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility.

#### 1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  1. Architect/Consultant will return RFIs submitted to Architect/Consultant by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

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- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to the District.
- D. Architect's Action: Architect/Consultant will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect/Consultant after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's/Consultant's action may include a request for additional information, in which case the allotted time for response will date from time of receipt of additional information.
  3. Architect's/Consultant's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect/Consultant and Owner's Representative in writing within seven days of receipt of the RFI response.
- E. On receipt of Architect's/Consultant's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect/Consultant and Owner's Representative within seven days if Contractor disagrees with response.

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- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site (e-Builder).

## 1.6 PROPOSAL REQUESTS

- A. Proposal Request Log: Contractor shall maintain a current log of all proposed requests and submit same at each project meeting and with each application for payment. Each proposal request shall have a unique number for tracking purpose. The log shall, at a minimum, show the proposal request number, date initiated, brief description, reference (i.e. RFI or supplemental instruction), estimated cost, estimated time, status, and reason for the proposal request (i.e. Unforeseen Condition/ Regulatory Requirement/ Owner Request/ E&O).

## 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner's Representative and Architect/Consultant of scheduled meeting dates and times.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner's Representative and Architect/Consultant, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
  - 1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Sustainable design requirements.

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- l. Preparation of record documents.
    - m. Use of the premises and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.
    - q. Responsibility for temporary facilities and controls.
    - r. Procedures for moisture and mold control.
    - s. Procedures for disruptions and shutdowns.
    - t. Construction waste management and recycling.
    - u. Parking availability.
    - v. Office, work, and storage areas.
    - w. Equipment deliveries and priorities.
    - x. First aid.
    - y. Security.
    - z. Progress cleaning.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
  1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/ Consultant and Owner's Representative of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.

- w. Required performance results.
  - x. Protection of adjacent work.
  - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at intervals indicated in Owner/Contractor Agreement.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect/ Consultant, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Progress cleaning.
      - 10) Quality and work standards.
      - 11) Status of correction of deficient items.
      - 12) Field observations.
      - 13) Status of RFIs.
      - 14) Status of proposal requests.
      - 15) Pending changes.
      - 16) Status of Change Orders.

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- 17) Pending claims and disputes.
    - 18) Documentation of information for payment requests.
  - 3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Project Closeout Conference: Conduct conference prior to Substantial Completion.
  - 1. Attendees: Owner, Architect/ Consultant, Contractor.
  - 2. Agenda: Procedures for completing and archiving closeout deliverables in e-Builder;
    - a. Requirements for preparing Record Documents;
    - b. Requirements for preparing O&Ms;
    - c. Submittal of warranties;
    - d. Requirements for delivery of Maintenance stock;
    - e. Requirements for demonstration and training.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 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 and with website’s training documents uploaded to the project folder.
- 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’s Representative: Owner shall pay for and provide licenses/access for the following members of the project team.
  - 1. Lead member of Architect’s/Consultant’s design team responsible.
  - 2. Contractor’s project manager or lead member of Contractor’s project staff.
  - 3. Others as deemed appropriate by Owner’s Representative.



Project Number: **20Y082.01****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 ay 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](http://www.e-builder.net)).
  - d. Users are recommended to have a properly licensed version 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 user’s 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’S 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.

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- 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. All other communication shall be conducted in an industry standard manner.
  - 5. Submittals, contracts, meeting minutes, and other project records.
  - 6. Application for payments.
  - 7. Project closeout.
- 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 communications 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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.1 CONSTRUCTION PROGRESS DOCUMENTATION

- A. Progress Schedules and Reports: The Contractor, within ten calendar days after being awarded the Contract, shall prepare and submit for the information of the Owner's Representative and the Architect/Consultant a Progress Schedule in critical path management ("CPM") format satisfactory to the Owner's 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 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 the 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.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

### 1.2 QUALITY CONTROL

- A. Submit 3-week work schedule, shop drawings, product data, samples, schedule of values and record documents as follows:
  - 1. Submit to Architect/Consultant and Owner's Representative only through General Contractor.
  - 2. The General Contractor shall provide a set of submittals to the Owner's Representative for review and approval concurrent with review by the Architect and Consultant(s).

### 1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's/ Consultant's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
  - 1. Architect/Consultant will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital data files are provided for Contractor's convenience and to help expedite the submittal preparation process. Use of the digital data files is at Contractor's risk and does not release the Contractor from verifying and indicating as-built conditions which may or may not be indicated in the digital data files.
    - c. Contractor shall execute a release of Architect's/Consultant's liability for Contractor's use of the digital data files. Release form shall be provide by Architect/Consultant.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect and Consultant reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

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- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect/Consultant's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Consultant or Owner's Representative will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect/Consultant.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01).

Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/ Consultant.
  4. Include the following information on an inserted cover sheet:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Name of subcontractor.
    - h. Name of supplier.
    - i. Name of manufacturer.
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Related physical samples submitted directly.
    - n. Other necessary identification.
- F. Options: Identify options requiring selection by the Architect.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's/ Consultant's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals that are marked with approval notation from Architect's or Consultant's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

#### A. General Submittal Procedure Requirements:

1. Post electronic submittals as PDF electronic files directly to e-Builder.
  - a. Architect/Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

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2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures." All closeout submittals to be uploaded to e-Builder in format acceptable to the District.
  3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
  4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data without field-verifying as-built conditions which may or may not be indicated at part of the released digital data files.



1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
  3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/ Consultant will return submittal with options selected.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or

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containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect/Consultant will retain two Sample sets; remainder will be returned.

- 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Submit product schedule in the following format:

- a. PDF electronic file.

- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

- G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

- H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

1. Submit subcontract list in the following format:

- a. PDF electronic file.

- J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

- K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

- M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

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- N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Consultant and Owner's Representative.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S/ CONSULTANT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect/ Consultant will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect or Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

## 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.
- 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 Owner's Representative's discretion, the superintendent may be issued a building key to allow access to areas 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 authority.
- K. Contractor shall 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 need to get an ID badge and a hard hat sticker (not provided by BSD), 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

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the proper ID badge and a hat sticker. The following are the convicted crimes that may appear on the background check:

- Aggravated Murder of 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
- 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 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
- Sadoomasochistic 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 (Including firearms located in a locked 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.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Consultant, Owner's Representative, or authorities having jurisdiction are not limited by provisions of this Section.

### 1.2 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

### 1.3 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### 1.4 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect/Consultant and Owner's Representative with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

## 1.5 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. **Testing Agency Responsibilities:** Cooperate with Architect, Consultant, Owner's Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect/Consultant, Owner's Representative and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- F. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

#### 1.6 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner's Representative will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:
  1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect/Consultant and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect/Consultant and Owner's Representative with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected work.

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION

##### 3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

## PART 1 - GENERAL

### 1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

### 1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### 1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl1

|        |                                                                    |
|--------|--------------------------------------------------------------------|
| AA     | Aluminum Association, Inc. (The)                                   |
| AAADM  | American Association of Automatic Door Manufacturers               |
| AABC   | Associated Air Balance Council                                     |
| AAMA   | American Architectural Manufacturers Association                   |
| AASHTO | American Association of State Highway and Transportation Officials |
| AATCC  | American Association of Textile Chemists and Colorists             |
| ABAA   | Air Barrier Association of America                                 |
| ABMA   | American Bearing Manufacturers Association                         |
| ACI    | American Concrete Institute                                        |
| ACPA   | American Concrete Pipe Association                                 |
| AEIC   | Association of Edison Illuminating Companies, Inc. (The)           |
| AF&PA  | American Forest & Paper Association                                |
| AGA    | American Gas Association                                           |
| AGC    | Associated General Contractors of America (The)                    |
| AHA    | American Hardboard Association<br>(Now part of CPA)                |
| AHAM   | Association of Home Appliance Manufacturers                        |
| AI     | Asphalt Institute                                                  |
| AIA    | American Institute of Architects (The)                             |

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|          |                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------|
| AISC     | American Institute of Steel Construction                                                                      |
| AISI     | American Iron and Steel Institute                                                                             |
| AITC     | American Institute of Timber Construction                                                                     |
| ALCA     | Associated Landscape Contractors of America<br>(Now PLANET - Professional Landcare Network)                   |
| ALSC     | American Lumber Standard Committee, Incorporated                                                              |
| AMCA     | Air Movement and Control Association International, Inc.                                                      |
| ANSI     | American National Standards Institute                                                                         |
| AOSA     | Association of Official Seed Analysts, Inc.                                                                   |
| APA      | Architectural Precast Association                                                                             |
| APA      | APA - The Engineered Wood Association                                                                         |
| APA EWS  | APA - The Engineered Wood Association; Engineered Wood Systems<br>(See APA - The Engineered Wood Association) |
| API      | American Petroleum Institute                                                                                  |
| ARI      | Air-Conditioning & Refrigeration Institute                                                                    |
| ARMA     | Asphalt Roofing Manufacturers Association                                                                     |
| ASCE     | American Society of Civil Engineers                                                                           |
| ASCE/SEI | American Society of Civil Engineers/Structural Engineering Institute<br>(See ASCE)                            |
| ASHRAE   | American Society of Heating, Refrigerating and Air-Conditioning Engineers                                     |
| ASME     | ASME International<br>(American Society of Mechanical Engineers International)                                |
| ASSE     | American Society of Sanitary Engineering                                                                      |
| ASTM     | ASTM International<br>(American Society for Testing and Materials International)                              |
| AWCI     | Association of the Wall and Ceiling Industry                                                                  |
| AWCMA    | American Window Covering Manufacturers Association<br>(Now WCMA)                                              |
| AWI      | Architectural Woodwork Institute                                                                              |



|       |                                                                                                        |
|-------|--------------------------------------------------------------------------------------------------------|
| AWPA  | American Wood Protection Association<br>(Formerly: American Wood Preservers' Association)              |
| AWS   | American Welding Society                                                                               |
| AWWA  | American Water Works Association                                                                       |
| BHMA  | Builders Hardware Manufacturers Association                                                            |
| BIA   | Brick Industry Association (The)                                                                       |
| BICSI | BICSI, Inc.                                                                                            |
| BIFMA | BIFMA International<br>(Business and Institutional Furniture Manufacturer's Association International) |
| BISSC | Baking Industry Sanitation Standards Committee                                                         |
| BSD   | Beaverton School District                                                                              |
| BWF   | Badminton World Federation<br>(Formerly: IBF - International Badminton Federation)                     |
| CCC   | Carpet Cushion Council                                                                                 |
| CDA   | Copper Development Association                                                                         |
| CEA   | Canadian Electricity Association                                                                       |
| CEA   | Consumer Electronics Association                                                                       |
| CFFA  | Chemical Fabrics & Film Association, Inc.                                                              |
| CGA   | Compressed Gas Association                                                                             |
| CIMA  | Cellulose Insulation Manufacturers Association                                                         |
| CISCA | Ceilings & Interior Systems Construction Association                                                   |
| CISPI | Cast Iron Soil Pipe Institute                                                                          |
| CLFMI | Chain Link Fence Manufacturers Institute                                                               |
| CRRC  | Cool Roof Rating Council                                                                               |
| CPA   | Composite Panel Association                                                                            |
| CPPA  | Corrugated Polyethylene Pipe Association                                                               |
| CRI   | Carpet and Rug Institute (The)                                                                         |

|              |                                                                                      |
|--------------|--------------------------------------------------------------------------------------|
| CRSI         | Concrete Reinforcing Steel Institute                                                 |
| CSA          | Canadian Standards Association                                                       |
| CSA          | CSA International<br>(Formerly: IAS - International Approval Services)               |
| CSI          | Cast Stone Institute                                                                 |
| CSI          | Construction Specifications Institute (The)                                          |
| CSSB         | Cedar Shake & Shingle Bureau                                                         |
| CTI          | Cooling Technology Institute<br>(Formerly: Cooling Tower Institute)                  |
| DHI          | Door and Hardware Institute                                                          |
| EIA          | Electronic Industries Alliance                                                       |
| EIMA         | EIFS Industry Members Association                                                    |
| EJCDC        | Engineers Joint Contract Documents Committee                                         |
| EJMA         | Expansion Joint Manufacturers Association, Inc.                                      |
| ESD          | ESD Association<br>(Electrostatic Discharge Association)                             |
| ETL SEMCO    | Intertek ETL SEMCO<br>(Formerly: ITS - Intertek Testing Service NA)                  |
| FIBA         | Federation Internationale de Basketball<br>(The International Basketball Federation) |
| FIVB         | Federation Internationale de Volleyball<br>(The International Volleyball Federation) |
| FM Approvals | FM Approvals LLC                                                                     |
| FM Global    | FM Global<br>(Formerly: FMG - FM Global)                                             |
| FMRC         | Factory Mutual Research<br>(Now FM Global)                                           |
| FRSA         | Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.        |
| FSA          | Fluid Sealing Association                                                            |

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|       |                                                                       |
|-------|-----------------------------------------------------------------------|
| FSC   | Forest Stewardship Council                                            |
| GA    | Gypsum Association                                                    |
| GANA  | Glass Association of North America                                    |
| GRI   | (Part of GSI)                                                         |
| GS    | Green Seal                                                            |
| GSI   | Geosynthetic Institute                                                |
| HI    | Hydraulic Institute                                                   |
| HI    | Hydronics Institute                                                   |
| HMMA  | Hollow Metal Manufacturers Association<br>(Part of NAAMM)             |
| HPVA  | Hardwood Plywood & Veneer Association                                 |
| HPW   | H. P. White Laboratory, Inc.                                          |
| IAS   | International Approval Services<br>(Now CSA International)            |
| IBF   | International Badminton Federation<br>(Now BWF)                       |
| ICEA  | Insulated Cable Engineers Association, Inc.                           |
| ICRI  | International Concrete Repair Institute, Inc.                         |
| IEC   | International Electrotechnical Commission                             |
| IEEE  | Institute of Electrical and Electronics Engineers, Inc. (The)         |
| IESNA | Illuminating Engineering Society of North America                     |
| IEST  | Institute of Environmental Sciences and Technology                    |
| IGCC  | Insulating Glass Certification Council                                |
| IGMA  | Insulating Glass Manufacturers Alliance                               |
| ILI   | Indiana Limestone Institute of America, Inc.                          |
| ISO   | International Organization for Standardization<br>Available from ANSI |
| ISSFA | International Solid Surface Fabricators Association                   |

|       |                                                                                   |
|-------|-----------------------------------------------------------------------------------|
| ITS   | Intertek Testing Service NA<br>(Now ETL SEMCO)                                    |
| ITU   | International Telecommunication Union                                             |
| KCMA  | Kitchen Cabinet Manufacturers Association                                         |
| LMA   | Laminating Materials Association<br>(Now part of CPA)                             |
| LPI   | Lightning Protection Institute                                                    |
| MBMA  | Metal Building Manufacturers Association                                          |
| MFMA  | Maple Flooring Manufacturers Association, Inc.                                    |
| MFMA  | Metal Framing Manufacturers Association, Inc.                                     |
| MH    | Material Handling<br>(Now MHIA)                                                   |
| MHIA  | Material Handling Industry of America                                             |
| MIA   | Marble Institute of America                                                       |
| MPI   | Master Painters Institute                                                         |
| MSS   | Manufacturers Standardization Society of The Valve and Fittings Industry Inc.     |
| NAAMM | National Association of Architectural Metal Manufacturers                         |
| NACE  | NACE International<br>(National Association of Corrosion Engineers International) |
| NADCA | National Air Duct Cleaners Association                                            |
| NAGWS | National Association for Girls and Women in Sport                                 |
| NAIMA | North American Insulation Manufacturers Association                               |
| NBGQA | National Building Granite Quarries Association, Inc.                              |
| NCAA  | National Collegiate Athletic Association (The)                                    |
| NCMA  | National Concrete Masonry Association                                             |
| NCPI  | National Clay Pipe Institute                                                      |
| NCTA  | National Cable & Telecommunications Association                                   |

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|       |                                                                                                                   |
|-------|-------------------------------------------------------------------------------------------------------------------|
| NEBB  | National Environmental Balancing Bureau                                                                           |
| NECA  | National Electrical Contractors Association                                                                       |
| NeLMA | Northeastern Lumber Manufacturers' Association                                                                    |
| NEMA  | National Electrical Manufacturers Association                                                                     |
| NETA  | InterNational Electrical Testing Association                                                                      |
| NFHS  | National Federation of State High School Associations                                                             |
| NFPA  | NFPA<br>(National Fire Protection Association)                                                                    |
| NFRC  | National Fenestration Rating Council                                                                              |
| NGA   | National Glass Association                                                                                        |
| NHLA  | National Hardwood Lumber Association                                                                              |
| NLGA  | National Lumber Grades Authority                                                                                  |
| NOFMA | NOFMA: The Wood Flooring Manufacturers Association<br>(Formerly: National Oak Flooring Manufacturers Association) |
| NOMMA | National Ornamental & Miscellaneous Metals Association                                                            |
| NRCA  | National Roofing Contractors Association                                                                          |
| NRMCA | National Ready Mixed Concrete Association                                                                         |
| NSF   | NSF International<br>(National Sanitation Foundation International)                                               |
| NSSGA | National Stone, Sand & Gravel Association                                                                         |
| NTMA  | National Terrazzo & Mosaic Association, Inc. (The)                                                                |
| NTRMA | National Tile Roofing Manufacturers Association<br>(Now TRI)                                                      |
| NWWDA | National Wood Window and Door Association<br>(Now WDMA)                                                           |
| OPL   | Omega Point Laboratories, Inc.<br>(Now ITS)                                                                       |
| PCI   | Precast/Prestressed Concrete Institute                                                                            |
| PDCA  | Painting & Decorating Contractors of America                                                                      |

|          |                                                                                                                                            |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------|
| PDI      | Plumbing & Drainage Institute                                                                                                              |
| PGI      | PVC Geomembrane Institute                                                                                                                  |
| PLANET   | Professional Landcare Network<br>(Formerly: ACLA - Associated Landscape Contractors of America)                                            |
| PTI      | Post-Tensioning Institute                                                                                                                  |
| RCSC     | Research Council on Structural Connections                                                                                                 |
| RFCI     | Resilient Floor Covering Institute                                                                                                         |
| RIS      | Redwood Inspection Service                                                                                                                 |
| SAE      | SAE International                                                                                                                          |
| SDI      | Steel Deck Institute                                                                                                                       |
| SDI      | Steel Door Institute                                                                                                                       |
| SEFA     | Scientific Equipment and Furniture Association                                                                                             |
| SEI/ASCE | Structural Engineering Institute/American Society of Civil Engineers<br>(See ASCE)                                                         |
| SGCC     | Safety Glazing Certification Council                                                                                                       |
| SIA      | Security Industry Association                                                                                                              |
| SIGMA    | Sealed Insulating Glass Manufacturers Association<br>(Now IGMA)                                                                            |
| SJI      | Steel Joist Institute                                                                                                                      |
| SMA      | Screen Manufacturers Association                                                                                                           |
| SMACNA   | Sheet Metal and Air Conditioning Contractors'<br>National Association                                                                      |
| SMPTE    | Society of Motion Picture and Television Engineers                                                                                         |
| SPFA     | Spray Polyurethane Foam Alliance<br>(Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray<br>Polyurethane Foam Division) |
| SPIB     | Southern Pine Inspection Bureau (The)                                                                                                      |
| SPRI     | Single Ply Roofing Industry                                                                                                                |

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|         |                                                                                                          |
|---------|----------------------------------------------------------------------------------------------------------|
| SSINA   | Specialty Steel Industry of North America                                                                |
| SSPC    | SSPC: The Society for Protective Coatings                                                                |
| STI     | Steel Tank Institute                                                                                     |
| SWI     | Steel Window Institute                                                                                   |
| SWRI    | Sealant, Waterproofing, & Restoration Institute                                                          |
| TCA     | Tile Council of America, Inc.<br>(Now TCNA)                                                              |
| TCNA    | Tile Council of North America, Inc.                                                                      |
| TIA/EIA | Telecommunications Industry Association/Electronic Industries Alliance                                   |
| TMS     | The Masonry Society                                                                                      |
| TPI     | Truss Plate Institute, Inc.                                                                              |
| TPI     | Turfgrass Producers International                                                                        |
| TRI     | Tile Roofing Institute                                                                                   |
| UL      | Underwriters Laboratories Inc.                                                                           |
| UNI     | Uni-Bell PVC Pipe Association                                                                            |
| USAV    | USA Volleyball                                                                                           |
| USGBC   | U.S. Green Building Council                                                                              |
| USITT   | United States Institute for Theatre Technology, Inc.                                                     |
| WASTEC  | Waste Equipment Technology Association                                                                   |
| WCLIB   | West Coast Lumber Inspection Bureau                                                                      |
| WCMA    | Window Covering Manufacturers Association                                                                |
| WCSC    | Window Covering Safety Council<br>(Formerly: WCMA - Window Covering Manufacturers Association)           |
| WDMA    | Window & Door Manufacturers Association<br>(Formerly: NWWDA - National Wood Window and Door Association) |
| WI      | Woodwork Institute (Formerly: WIC - Woodwork Institute of California)                                    |
| WIC     | Woodwork Institute of California<br>(Now WI)                                                             |

WMMPA        Wood Moulding & Millwork Producers Association

WSRCA        Western States Roofing Contractors Association

WWPA        Western Wood Products Association

C.    Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl2

IAPMO       International Association of Plumbing and Mechanical Officials

ICC        International Code Council

ICC-ES      ICC Evaluation Service, Inc.

UBC        Uniform Building Code  
(See ICC)

D.    Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl3

CE        Army Corps of Engineers

CPSC       Consumer Product Safety Commission

DOC        Department of Commerce

DOD        Department of Defense

DOE        Department of Energy

EPA        Environmental Protection Agency

FAA        Federal Aviation Administration

FCC        Federal Communications Commission

FDA        Food and Drug Administration

GSA        General Services Administration

HUD        Department of Housing and Urban Development

LBL        Lawrence Berkeley National Laboratory

NCHRP      National Cooperative Highway Research Program  
(See TRB)



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|      |                                                |
|------|------------------------------------------------|
| NIST | National Institute of Standards and Technology |
| OSHA | Occupational Safety & Health Administration    |
| PBS  | Public Buildings Service<br>(See GSA)          |
| PHS  | Office of Public Health and Science            |
| RUS  | Rural Utilities Service<br>(See USDA)          |
| SD   | State Department                               |
| TRB  | Transportation Research Board                  |
| USDA | Department of Agriculture                      |
| USPS | Postal Service                                 |

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl4

|         |                                                                                                                                                                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ADAAG   | Americans with Disabilities Act (ADA)<br>Architectural Barriers Act (ABA)<br>Accessibility Guidelines for Buildings and Facilities<br>Available from U.S. Access Board                                                                                     |
| CFR     | Code of Federal Regulations<br>Available from Government Printing Office                                                                                                                                                                                   |
| DOD     | Department of Defense Military Specifications and Standards<br>Available from Department of Defense Single Stock Point                                                                                                                                     |
| DSCC    | Defense Supply Center Columbus<br>(See FS)                                                                                                                                                                                                                 |
| FED-STD | Federal Standard<br>(See FS)                                                                                                                                                                                                                               |
| FS      | Federal Specification<br>Available from Department of Defense Single Stock Point<br><br>Available from Defense Standardization Program<br><br>Available from General Services Administration<br><br>Available from National Institute of Building Sciences |

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FTMS      Federal Test Method Standard  
              (See FS)

MIL        (See MILSPEC)

MIL-STD   (See MILSPEC)

MILSPEC   Military Specification and Standards  
              Available from Department of Defense Single Stock Point

UFAS      Uniform Federal Accessibility Standards  
              Available from Access Board

F.      State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl5

CBHF      State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR      California Code of Regulations

CPUC      California Public Utilities Commission

TFS      Texas Forest Service  
            Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

### 1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect/Consultant, Owner's Representative, testing agencies, and authorities having jurisdiction. Temporary facilities required for the project include but may not be limited to:
  - 1. Sanitary Facilities
  - 2. Telephone/Fax
  - 3. Internet
- B. Water from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

### 1.4 QUALITY ASSURANCE

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

### 1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures."

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  - 1. Provide portable facilities as required for workmen. Keep facilities clean and in sanitary condition. Remove from the site upon completion of the Work.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
  - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. At a conspicuous place within the primary field office post a list of important telephone numbers, including:
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Architect's office.
    - e. Engineers' offices.
    - f. Owner's Representative's office.
    - g. Principal subcontractors' field and home offices.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- B. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- C. Temporary Enclosures: Contractor to provide Weather Mitigation Plan in the event of rain and to establish procedures for temporary protection as well as an emergency contact list, please see roofing specification 075423 for additional information. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Prohibit smoking in construction areas.
  2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  3. Develop and supervise an overall fire-prevention -and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### 3.4 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. 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 to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION

## 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/Consultant and Owner's Representative.
- 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 by the Architect/Consultant or Owner's Representative.
- 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 submittal to the Architect through the Owner's Project Management Database (e-Builder).\
- 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.

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1. Consult with Architect/Consultant 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Coordination of Owner-installed products.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
  - 8. Correction of the Work.
- B. Related Sections:
  - 1. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 2. Division 01 Section "Cutting and Patching".

### 1.2 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect and Owner's Representative for the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner's Representative that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect/ Consultant according to requirements in Division 01 Section "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and as-built conditions. If discrepancies are discovered, notify Architect/ Consultant promptly.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Allow for building movement, including thermal expansion and contraction.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.6 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

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- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

### 3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

### 1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio. Notify A/E immediately and without further modification to structural elements if such compromise to structure inadvertently occurs.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Notify A/E immediately if such compromise to operational elements inadvertently occurs.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials. Submit 3 samples for Architect and Owner approval.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

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1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

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1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
1. Substantial Completion procedures.
  2. Final completion procedures.
  3. Warranties.
  4. Final cleaning.

### 1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  2. Advise Owner's Representative of pending insurance changeover requirements.
  3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  8. Complete startup testing of systems.
  9. Submit test/adjust/balance records.
  10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  11. Advise Owner of changeover in heat and other utilities.
  12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  13. Complete final cleaning requirements, including touchup painting.
  14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
  15. Prepare Closeout Log: An electronic spreadsheet log listing all closeout deliverables required in the specifications including contractor's record drawings, warranties, shop drawings, product data, extra stock, training and O&Ms. See Sample Closeout Log provided in at the end of this section.

- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  - 2. Results of completed inspection will form the basis of requirements for final completion.

### 1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
  - 1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
  - 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 4. Submit pest-control final inspection report and warranty.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### 1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize list of spaces in a sequential order.
  - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  - 3. Submit list of incomplete items in the following format:
    - a. PDF electronic file.

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## 1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Scan warranties and bonds and assemble complete warranty and bond submittal package into individual PDF files organized by specification section.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

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- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
- m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
- o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- r. Leave Project clean and ready for occupancy.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operations and Maintenance Manual.
- B. See Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

### 1.2 SUBMITTALS

- A. Manual: Submit electronic manual in final form at least 15 days before final inspection. Architect/Consultant and Owner's Representative will return an electronic copy with comments within 15 days after final inspection.
  - 1. Correct or modify each manual to comply with Architect's comments. Submit final electronic copy of each corrected manual within 15 days of receipt of Architect's/Consultant's and Owner's Representative's comments.

## PART 2 - PRODUCTS

### 2.1 MANUAL, GENERAL

- A. Organization: Unless otherwise indicated, organize manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. The manual shall contain a title page, table of contents, and manual contents.
- B. Title Page: Include the following information:
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Name and address of Owner.
  - 4. Date of submittal.
  - 5. Name, address, and telephone number of Contractor.
  - 6. Name and address of Architect.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Arrange contents numerically by specification section.

**OPERATION INFORMATION**

- E. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.
- F. Descriptions: Include the following:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Equipment identification with serial number of each component.
  - 4. Equipment function.
  - 5. Operating characteristics.
  - 6. Limiting conditions.
  - 7. Performance curves.
  - 8. Engineering data and tests.
  - 9. Complete nomenclature and number of replacement parts.
- G. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
- H. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- I. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

**PRODUCT MAINTENANCE INFORMATION**

- J. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- K. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- L. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- M. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

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- N. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- O. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

#### SYSTEMS AND EQUIPMENT MAINTENANCE INFORMATION

- P. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- Q. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- R. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:
- S. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions that detail essential maintenance procedures:
- T. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- U. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- V. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- W. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

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- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
- E. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. See Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
- C. See Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

### 1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Submit one set of marked-up Record Prints, and the following:
      - 1) Record CAD Drawing Files and Plots: One set.
      - 2) Copies printed from Record CAD Drawing Plots: One. Plot and print each Drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one copy copies of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
  - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

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- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
  2. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Architect for resolution.
  4. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into single PDF file.
  2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
  4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

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1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

# PART 3 - EXECUTION

## 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION

PART 1 - GENERAL

1.1 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to Final Completion or acceptance, fully instruct the Owner's Designated Representative and maintenance personnel in the operation, adjustment, and maintenance of all products, equipment, and systems.
  - 1. The District reserves the right to videotape training sessions.
- B. Operating and maintenance manual shall constitute the basis of instruction.
  - 1. Review contents of manual with Owner's personnel in full detail to explain all aspects of operations and maintenance.
  - 2. Review complete heating and cooling cycles with Owner's Designated Representative. Review location of dampers, valves, and control equipment.

END OF SECTION

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022623      LIMITED SUPPLEMENTAL ASBESTOS SURVEY REPORT  
(see next page)

# **LIMITED SUPPLEMENTAL ASBESTOS SURVEY REPORT**

## **Errol Hassell Elementary School Roof Project**

**18100 SW Bany Road  
Beaverton, OR 97007**

Prepared for:

### **Beaverton School District**

**16550 SW Merlo Road  
Beaverton, OR 97006**

**Inspection Dates:** August 11, 2020  
**Report Prepared:** September 2, 2020

Prepared By:



**4105 SE International Way, Suite 505  
Milwaukie, OR 97222  
503.387.3251**

TRC Project Number: 406451

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- Appendix C – Inspector Certification(s)

## **EXECUTIVE SUMMARY**

TRC Environmental Corporation (TRC) was contracted by the Beaverton School District to conduct a supplemental 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. Matt Cuda, AHERA accredited building inspector performed the survey on August 11<sup>th</sup>, 2020. 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, based on the PLM method.

However, 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 supplemental 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 asbestos survey is being conducted in conjunction with their roof renovation project. The survey activities were performed on August 11<sup>th</sup>, 2020, 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. Laboratory analytical results are presented in Appendix B.

Mr. Matt Cuda, 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

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 EMC Labs, Inc., in Phoenix, Arizona, 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, July 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 |
|----------------------------|------------------------------------|----------------------------------|------------------|----------------------|
| EH-01A<br>EH-01B<br>EH-01C | Built-up Roofing with Rock Overlay | Throughout Modular Building Roof | ND               | N/A                  |
| EH-02A<br>EH-02B<br>EH-02C | Silver Roof Paint                  | Throughout Modular Building Roof | ND               | N/A                  |
| EH-03A<br>EH-03B<br>EH-03C | White/Gray Roof Caulking           | Throughout Modular Building Roof | ND               | N/A                  |
| EH-04A<br>EH-04B<br>EH-04C | Black Roof Caulking                | Throughout Modular Building Roof | ND               | N/A                  |

ND = Non-detect

SF = Square feet

LF = Linear Feet

N/A = Not Applicable

### Asbestos Containing Materials (ACMs)

Results of the bulk sampling indicated none of the materials sampled during this limited survey contained detectable levels of asbestos, based on the PLM method.

### Non-Detect Materials (ND)

Asbestos was not detected in the following materials sampled during this investigation:

| Material                           | Location                         |
|------------------------------------|----------------------------------|
| Built-up Roofing with Rock Overlay | Throughout Modular Building Roof |
| Silver Roof Paint                  | Throughout Modular Building Roof |
| White/Gray Roof Caulking           | Throughout Modular Building Roof |
| Black Roof Caulking                | Throughout Modular Building Roof |

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., hidden roofing materials, 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

Results of the bulk sampling indicated none of the materials sampled during this survey contained detectable levels of asbestos, based on the PLM method. However, 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**

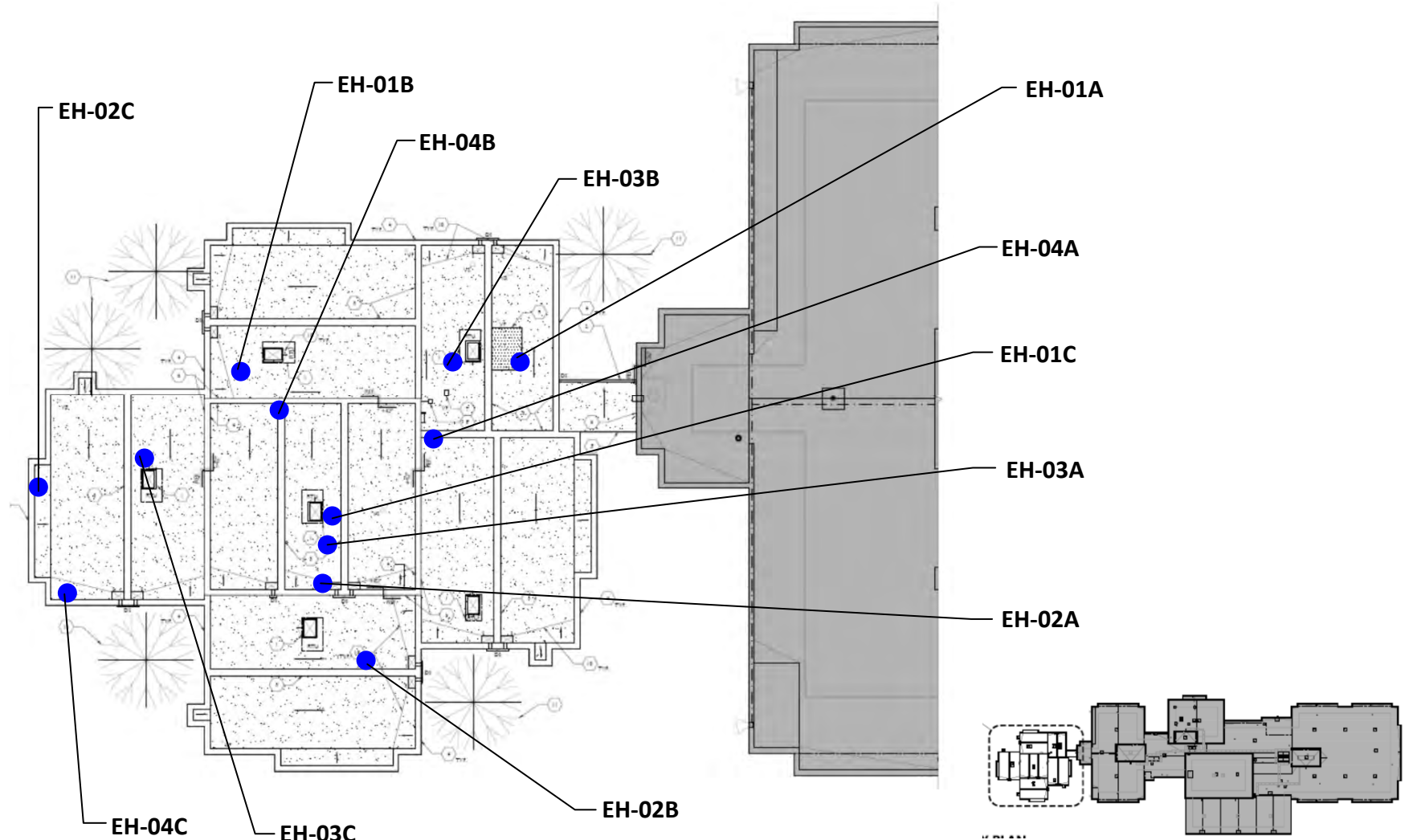


Matthew Cuda  
Project Manager



Ron Landolt, CAC  
NW Region BSI Practice Manager

## **Appendix A – Figure(s)**



# **LEGEND**

- — Non-Asbestos Sample Location
- ★ — Asbestos-Containing Sample Location
- ▲ — OSHA Regulated Sample Location

## **ASBESTOS SURVEY REPORT SAMPLE LOCATION DIAGRAM**

ERROL HASSELL ELEMENTARY SCHOOL  
18100 SW BANY ROAD  
BEAVERTON, OREGON 97007

TRC Project No.: 406451.0001

Figure: 1

Drawn by: MC

Reviewed by: RAL

Date: September 2020



4105 SE International Way, Suite 505  
Milwaukie, Oregon 97222  
Phone: (503) 387-3251 Fax: (503) 908-1318

## **Appendix B – Laboratory Analytical Data Sheets**

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0241378**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client: TRC SOLUTIONS Job# / P.O. #: 406451  
Address: 4105 SE INTERNATIONAL WAY, STE 505 Date Received: 08/12/2020  
MILWAUKIE OR 97222 Date Analyzed: 08/17/2020  
Collected: 08/11/2020 Date Reported: 08/17/2020  
Project Name: BSD-ERROL HASSELL E.S. ROOF EPA Method: EPA 600/R-93/116  
PROJECT Submitted By: MATT CUDA  
Address: Collected By:

| Lab ID<br>Client ID   | Sample<br>Location                 | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents              |
|-----------------------|------------------------------------|------------------------------------|----------------------|----------------------|-------------------------------------------|
| 0241378-001<br>EH-01A | THROUGHOUT<br>MODULAR BLDG<br>ROOF | LAYER 1<br>BUR, Black              | No                   | None Detected        | Fibrous Glass 30%<br>Cellulose Fiber 15%  |
|                       |                                    |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 55% |
|                       |                                    | LAYER 2<br>BUR, Black              | No                   | None Detected        | Cellulose Fiber 40%                       |
|                       |                                    |                                    |                      |                      | Gypsum<br>Quartz<br>Binder/Filler 60%     |
|                       |                                    | LAYER 3<br>BUR, Brown/ Tan         | No                   | None Detected        | Cellulose Fiber 90%                       |
|                       |                                    |                                    |                      |                      | Gypsum<br>Binder/Filler 10%               |
|                       |                                    |                                    |                      |                      |                                           |
|                       |                                    |                                    |                      |                      |                                           |
|                       |                                    |                                    |                      |                      |                                           |
| 0241378-002<br>EH-01B | THROUGHOUT<br>MODULAR BLDG<br>ROOF | LAYER 1<br>BUR, Black              | No                   | None Detected        | Fibrous Glass 40%<br>Cellulose Fiber 15%  |
|                       |                                    |                                    |                      |                      | Carbonates<br>Binder/Filler 45%           |
|                       |                                    | LAYER 2<br>BUR, Black              | No                   | None Detected        | Cellulose Fiber 60%                       |
|                       |                                    |                                    |                      |                      | Carbonates<br>Binder/Filler 40%           |
|                       |                                    | LAYER 3<br>BUR, Brown/ Tan         | No                   | None Detected        | Fibrous Glass 75%<br>Cellulose Fiber 5%   |
|                       |                                    |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 20% |
|                       |                                    |                                    |                      |                      |                                           |
|                       |                                    |                                    |                      |                      |                                           |
|                       |                                    |                                    |                      |                      |                                           |

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0241378**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

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Address: 4105 SE INTERNATIONAL WAY, STE 505 Date Received: 08/12/2020  
MILWAUKIE OR 97222 Date Analyzed: 08/17/2020  
Collected: 08/11/2020 Date Reported: 08/17/2020  
Project Name: BSD-ERROL HASSELL E.S. ROOF EPA Method: EPA 600/R-93/116  
Address: PROJECT Submitted By: MATT CUDA  
Collected By:

| Lab ID<br>Client ID   | Sample<br>Location                 | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents               |           |
|-----------------------|------------------------------------|------------------------------------|----------------------|----------------------|--------------------------------------------|-----------|
| 0241378-003<br>EH-01C | THROUGHOUT<br>MODULAR BLDG<br>ROOF | LAYER 1<br>BUR, Black              | No                   | None Detected        | Cellulose Fiber                            | 50%       |
|                       |                                    |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler      | 50%       |
|                       |                                    | LAYER 2<br>BUR, Black              | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler      | 100%      |
|                       |                                    | LAYER 3<br>BUR, Brown/ Tan         | No                   | None Detected        | Cellulose Fiber<br>Gypsum<br>Binder/Filler | 95%<br>5% |
| 0241378-004<br>EH-02A | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Paint, Silver                      | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler      | 100%      |
|                       |                                    |                                    |                      |                      |                                            |           |
| 0241378-005<br>EH-02B | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Paint, Silver                      | No                   | None Detected        | Cellulose Fiber                            | 2%        |
|                       |                                    |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler      | 98%       |
| 0241378-006<br>EH-02C | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Paint, Silver                      | No                   | None Detected        | Cellulose Fiber                            | <1%       |
|                       |                                    |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler      | 99%       |



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9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
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Laboratory Report

**0241378**

## Bulk Asbestos Analysis by Polarized Light Microscopy

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MILWAUKIE OR 97222 Date Analyzed: 08/17/2020  
Collected: 08/11/2020 Date Reported: 08/17/2020  
Project Name: BSD-ERROL HASSELL E.S. ROOF EPA Method: EPA 600/R-93/116  
PROJECT Submitted By: MATT CUDA  
Address: Collected By:

| Lab ID<br>Client ID   | Sample<br>Location                 | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                  |
|-----------------------|------------------------------------|------------------------------------|----------------------|----------------------|-----------------------------------------------|
| 0241378-007<br>EH-03A | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Roof Caulking, White               | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100% |
| 0241378-008<br>EH-03B | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Roof Caulking, White               | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100% |
| 0241378-009<br>EH-03C | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Roof Caulking, White               | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100% |
| 0241378-010<br>EH-04A | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Roof Caulking, Black               | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100% |
| 0241378-011<br>EH-04B | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Roof Caulking, Black               | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100% |

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0241378**

## Bulk Asbestos Analysis by Polarized Light Microscopy

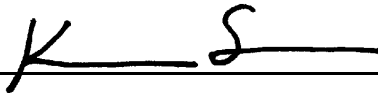
NVLAP#101926-0

Client: TRC SOLUTIONS  
Address: 4105 SE INTERNATIONAL WAY, STE 505  
MILWAUKIE OR 97222  
Collected: 08/11/2020  
Project Name: BSD-ERROL HASSELL E.S. ROOF  
PROJECT  
Address:

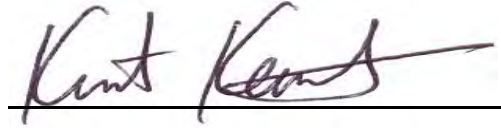
Job# / P.O. #: 406451  
Date Received: 08/12/2020  
Date Analyzed: 08/17/2020  
Date Reported: 08/17/2020  
EPA Method: EPA 600/R-93/116  
Submitted By: MATT CUDA

Collected By:

| Lab ID<br>Client ID   | Sample<br>Location                 | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents               |
|-----------------------|------------------------------------|------------------------------------|----------------------|----------------------|--------------------------------------------|
| 0241378-012<br>EH-04C | THROUGHOUT<br>MODULAR BLDG<br>ROOF | Roof Caulking, Black               | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler 100% |



Analyst - Kenneth Scheske



Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicated or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. These reports are for the exclusive use of the addressed client and that they will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of thirty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method for asbestos. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. Polarized Light Microscopy may not be consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials.

# CHAIN OF CUSTODY

EMC Labs, Inc.  
9830 S. 51<sup>st</sup> St., Ste B-109  
Phoenix, AZ 85044  
(480) 940-5294 Fax (480) 893-1726

LAB#: 241378  
TAT: 3 Days  
Rec'd: AUG 12 P.M.

COMPANY NAME: TRC SOLUTIONS  
Address: 4105 SE International Way, Suite 505  
Milwaukie, Oregon 97222  
CONTACT: Ron Landolt Scan & Excel  
Phone/Fax: (503) 387-3251 / (503) 908-1318  
Email: rlandolt@trcsolutions.com and mcuda@trcsolutions.com

BILL TO: \_\_\_\_\_ (If Different Location)  
Phoenix, AZ \_\_\_\_\_

Now Accepting: **VISA – MASTERCARD**

Price Quoted: \$ \_\_\_\_\_ / Sample \$ \_\_\_\_\_ / Layers

**COMPLETE ITEMS 1-4: (Failure to complete any items may cause a delay in processing or analyzing your samples)**

**1. TURNAROUND TIME:** [Same Day Rush] [1-2 Days] [3-4-5 Days] [6-10 Days]

\*\*\*\*Prior confirmation of turnaround time is required

\*\*\*\*Additional charges for rush analysis (please call marketing department for pricing details)

\*\*\*\*Laboratory analysis may be subject to delay if credit terms are not met

**2. TYPE OF ANALYSIS:** [Bulk-PCM] [Air-PCM] [Lead] [Point Count] [Fungi: AOC, W-C, Bulk, Swab, Tape]

**3. DISPOSAL INSTRUCTIONS:** [Dispose of samples at EMC] / [Return samples to me at my expense]

(If you do not indicate preference, EMC will dispose of samples 30 days from analysis.)

**4. Project Name:** BSD – Errol Hassell E.S. Roof Project

**P.O. Number:** \_\_\_\_\_ **Project Number:** 406451

| EMC<br>SAMPLE # | CLIENT<br>SAMPLE # | DATE & TIME<br>SAMPLED | LOCATION/MATERIAL<br>TYPE | Samples<br>Accepted<br>Yes / No | AIR SAMPLE INFO / COMMENTS |     |              |
|-----------------|--------------------|------------------------|---------------------------|---------------------------------|----------------------------|-----|--------------|
|                 |                    |                        |                           |                                 | ON                         | OFF | FLOW<br>RATE |
| 1               | EH-01A             | 8-11-20                | See Attached Field Logs   | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
| 12              | EH-04C             |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |
|                 |                    |                        |                           | Y N                             |                            |     |              |

**SPECIAL INSTRUCTIONS:**

Sample Collector: (Print) Math Cuda

(Signature) Math Cuda

Relinquished by: Math Cuda

Date/Time: 8-11-20 15:00

Received by: Diana Federico

Date/Time: 8/12/20

Relinquished by: Diana Federico

Date/Time: 8/12/20 4pm

Received by: BS

Date/Time: 8/12/2020 1600

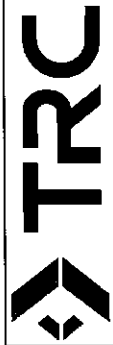
Relinquished by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Received by: \_\_\_\_\_

Date/Time: \_\_\_\_\_

\*\* In the event of any dispute between the above parties for these services or otherwise, parties agree that jurisdiction and venue will be in Phoenix, Arizona and prevailing party will be entitled to attorney's fees and court costs.



4105 SE International Way, Suite 505,  
Milwaukie, OR 97222

## ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM

|                                                                                                                                                             |                                            |                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------|
| Client:<br>Beaverton School District                                                                                                                        | Project Number:<br>406451                  | Inspector(s):<br>Matt Cuda |
| Project Name:<br>BSD - Errol Hassell Elementary School Roof<br>Project<br>Errol Hassell Elementary School<br>18100 SW Bany Road<br>Beaverton , Oregon 97007 | Tracking Number:                           | Requested TAT:<br>3 DAY    |
| Email Results to:<br>mcuda@trccompanies.com,<br>rlandolt@trccompanies.com                                                                                   | Analytical Method:<br>PLM EPA 600/R-93/116 | Lab Comments:              |

### ASBESTOS BULK SAMPLE INFORMATION

| Date Collected | Sample Identification | Material Description               | Homogeneous Area                 | Sample Location  | Lab Identification (Lab Use Only) |
|----------------|-----------------------|------------------------------------|----------------------------------|------------------|-----------------------------------|
| 2020-08-11     | EH-01A                | Built-up Roofing with Rock Overlay | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-01B                | Built-up Roofing with Rock Overlay | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-01C                | Built-up Roofing with Rock Overlay | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-02A                | Silver Roof Paint                  | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-02B                | Silver Roof Paint                  | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-02C                | Silver Roof Paint                  | Throughout Modular Building Roof | See Diagram Roof |                                   |

| Date Collected | Sample Identification | Material Description      | Homogeneous Area                 | Sample Location  | Lab Identification (Lab Use Only) |
|----------------|-----------------------|---------------------------|----------------------------------|------------------|-----------------------------------|
| 2020-08-11     | EH-03A                | White/ Gray Roof Caulking | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-03B                | White/ Gray Roof Caulking | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-03C                | White/ Gray Roof Caulking | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-04A                | Black Roof Caulking       | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-04B                | Black Roof Caulking       | Throughout Modular Building Roof | See Diagram Roof |                                   |
| 2020-08-11     | EH-04C                | Black Roof Caulking       | Throughout Modular Building Roof | See Diagram Roof |                                   |

Special Instruction to Laboratory:

N/A

| Relinquished By:              | Date       | Time         | Received By:                  | Date      | Time   |
|-------------------------------|------------|--------------|-------------------------------|-----------|--------|
| I. (Print): Matt Cuda         | 2020-08-11 | 14:51:44 PDT | I. (Print): Diana Federico    | 8/12/20   | 915 am |
| (Sign): <i>W. A. Cuda</i>     |            |              | (Sign): <i>Diana Federico</i> |           |        |
| II. (Print): Diana Federico   | 8/12/20    | 4 pm         | II. (Print): KEN SCHEDULE     | 8/12/2020 | 1600   |
| (Sign): <i>Diana Federico</i> |            |              | (Sign): <i>[Signature]</i>    |           |        |

## **Appendix C – Inspector Certification(s)**

---

# ***The Environmental Institute***

---

---

## *Matthew Cuda*

---

Social Security Number - XXX-XX-8274

TRC - 4105 SE International Way - Milwaukie, OR 97222

*Has completed 4 hours of coursework and satisfactorily  
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EPA/AHERA/ASHARA (TSCA Title II) Approved Reaccreditation*

### *Asbestos in Buildings: Inspector Refresher*

*January 31, 2020*

Course Date

*17792*

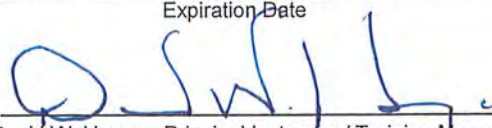
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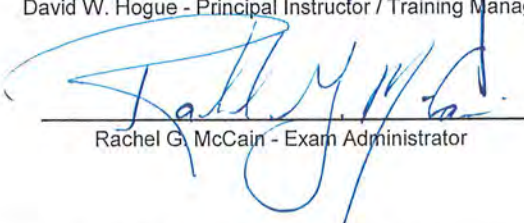
*January 31, 2020*

Examination Date

*January 30, 2021*

Expiration Date

  
David W. Hogue - Principal Instructor / Training Manager

  
Rachel G. McCain - Exam Administrator



(Approved by the ABIH Certification Maintenance Committee for 1/2 CM point - Approval #11-577)

(Florida Provider Registration Number FL49-0001342 - Course #FL49-0002805)

TEI - 1395 S. Marietta Parkway SE - Building 100, Suite 124 - Marietta, GA 30067

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## SECTION 061000 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Wood blocking, cants, and nailers.
  - 5. Wood furring.
  - 6. Wood sleepers.

#### 1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. OSB: Oriented strand board.
- E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.



## PART 2 - PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

### 2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
  - 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
  - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
- D. Application: Treat items indicated on Drawings, and the following:
  - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

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2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.

## 2.3 DIMENSION LUMBER FRAMING

### A. Ceiling Joists: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WHPA.

### B. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WHPA.

### C. Exposed Framing Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Species and Grade: As indicated above for load-bearing construction of same type.

## 2.4 ENGINEERED WOOD PRODUCTS

### A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2600 psi (17.9 MPa for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).

### B. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).

### C. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055.

1. Web Material: Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
2. Structural Properties: Depths and design values not less than those indicated.

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3. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.
- D. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.
  1. Manufacturer: Provide products by same manufacturer as I-joists.
  2. Material: product made from any combination solid lumber, wood strands, and veneers.
  3. Thickness: as indicated.
  4. Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  1. Blocking.
  2. Nailers.
  3. Rooftop equipment bases and support curbs.
  4. Cants.
  5. Furring.
- B. Dimension Lumber Items: No. 2 grade lumber of any of the following species:
  1. Hem-fir; WCLIB or WWPA.
  2. Douglas fir-larch; WCLIB or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
  1. Douglas fir-larch; No. 2 grade WCLIB or WWPA
  2. Hem-fir No. 2 grade: WCLIB, or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

## 2.6 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
  1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or of Type 304 stainless steel.

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- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

## 2.7 METAL FRAMING ANCHORS

- A. Allowable design loads, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  - 1. Use for wood-preserved-treated lumber and where indicated.
- D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304
  - 1. Use for exterior locations and where indicated.

## 2.8 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

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- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- D. Install metal framing anchors to comply with manufacturer's written instructions.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - 2. ICC-ES evaluation report for fastener.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
  - 1. Comply with indicated fastener patterns where applicable.
  - 2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 INSTALLATION OF WOOD FURRING

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring vertically at 24 inches (610 mm) o.c.

3.4 INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

- A. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  - 1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

3.5 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 075423 – THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING AND RELATED SHEET METAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Induction welded mechanically attached TPO membrane roofing system.
- B. High density polyiso cover board.
- C. Sheet Metal Flashing and Trim:
  - 1. Formed roof-drainage sheet metal fabrications.
  - 2. Formed low-slope roof sheet metal flashings.
  - 3. Formed wall sheet metal fabrications.
  - 4. Formed equipment support flashings.
  - 5. Sheet metal counter flashing.
- D. Miscellaneous materials.
- E. Preparation of existing roofing system for new recover application.

1.2 REFERENCES

- A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:
  - 1. ASTM D1079, Standard Terminology Relating to Roofing and Waterproofing.
  - 2. The NRCA Roofing and Waterproofing Manual.
  - 3. Roof Consultants Institute, Glossary of Building Envelope Terms.
- B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

1.3 DESIGN CRITERIA

- A. General: Installed roofing membrane system to remain watertight and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials to be compatible with one another under conditions of service and application required and as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Installer to comply with current code requirements based on Authority Having Jurisdiction.
- D. Wind Uplift Performance: Roofing system to be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Materials to be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E108, for application and roof slopes indicated.

#### 1.4 SUBMITTALS

##### A. Moisture Mitigation Plan Submittal:

- 1. Contractor shall prepare and submit a 3-part moisture mitigation plan to address potential inclement weather and for District and Architect approval prior to commencement of work. The moisture mitigation plan shall include the following:
  - 2. Part 1: Prevention
    - a. Contractor's protocol for obtaining and reviewing weather forecast during construction and disseminating forecasted weather information and concerns to the Project Team. Include weather forecast source, intervals at which the forecast will be reviewed and the Contractor's method for disseminating forecasted weather-related impacts or concerns to the Project Team.
    - b. Contractor's protocol for weatherizing building at end of each work day
      - 1) Include a roof plan showing areas where temporary weatherization are to be employed with detailed information of materials and techniques used to achieve temporary weatherization. Provide drawing details as needed to clarify intent and reference details on plan. If re-roof is to be phased, submit requested roof plan for each phase
      - 2) Provide a list of key members of the Construction team involved with end-of-day weatherization and their associated roles and responsibilities (e.g., Those responsible for performing the work, those responsible for overseeing work being performed, those responsible for a quality control check after work is completed, etc...)
    - c. Provide list of equipment and where it is to be stored on-site for full project duration and for the sole purpose of deploying during a wet weather emergency to help minimize immediate wet weather affects to unprotected surfaces and affected interior areas.
    - d. Contractor's Action Plan (To be posted in job trailer or other District-approved location): Provide an organized and cohesive Action Plan for addressing wet weather intrusion. A separate Action Plan shall be provided for each of two scenarios:
      - 1) Scenario A: Wet weather is encountered during the workday with appointed staff available to respond immediately.
      - 2) Scenario B: Wet weather is encountered during off-work hours with few or no appointed construction staff on site.
      - 3) For each of the above scenarios, include in the Action Plan (at a minimum) the following:



- a) Response Team: Appoint a wet weather Response Team capable of adequately implementing contractor's Action Plan. This team shall consist of selected Contractor's staff and those of subcontractors as needed at Contractor's discretion. In addition, the District will provide a list of District and School staff to be included as part of the Response Team. Provide a list for each member of the Response Team and include emergency contact information for each, including name, role, phone number and e-mail address. Include in this list and identify at least one member of Contractor's appointed Response Team who can be reached on a 24-hour, seven days-per-week basis.
  - b) Stakeholder Contact List: The District will provide a list of District stakeholders to be contacted in the event of wet weather intrusion into the building for Contractor's integration with the Action Plan.
  - c) Location of dehumidifying equipment, drip buckets, absorbing blankets, moisture absorbing media, etc. to be employed if unprotected exterior surfaces are exposed to moisture and/or if moisture has penetrated the building envelope into the building's interior. Include instructions for locating and operating equipment if required. Refer to Item Part 1.c above for Contractor's list of equipment and materials to be stored on-site.
  - d) Sequence of Operations: Develop a Sequence of Operations for employing the Action Plan, including prioritizing the individuals to be notified upon implementation of the Action Plan and steps required to ensure moisture mitigation measures' effectiveness throughout the course of the wet weather event. As part of this sequence of operations identify the source and contact information for those responsible in supplying additional moisture mitigation equipment and materials if needed to address significant or prolonged wet weather event.
  - e. Contractor's method for educating Contractor and Subcontractor staff of Moisture Mitigation Plan, including Action Plan, and gaging such staff's preparedness to execute the Contractor's Action Plan.
3. Part 2: Immediate Response
- a. Provide written protocol for implementing Action Plan for both scenarios identified above.
4. Part 3: Moisture and Mold Mitigation
- a. Identify Contractor's protocol for quantifying wet weather related impact to exposed exterior surfaces and interior spaces and how Contractor intends to disseminate this information to The District and Architect. Include description of technologies to be employed for moisture detection in concealed and unconcealed locations. Initial verbal notification to the Owner and Architect shall take place within 24 hours of a water intrusion event.
  - b. Identify measures to be taken after immediate wet weather event to ensure continued moisture and mold mitigation response. Include Contractor's protocol for drying and/or cleaning of school assets impacted by wet weather, including electronics, books, classroom and office furniture, etc.

- c. Describe the conditions under which Contractor-provided moisture and mold mitigation equipment and materials/supplies would be disengaged following a wet weather intrusion.
  - d. Provide written confirmation that Contractor intends to work collaboratively with and support an Owner or Architect-contracted industrial hygienist or other moisture and mold mitigation expert. Such subcontractor may be hired at Owner's discretion to help quantify the locations and effects of wet weather related impacts for Contractor remediation.
  - e. Outline Contractor's protocol for wet weather-related clean up.
- B. Product Data: Manufacturer data sheets for each product to be provided.
- C. Roof Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:
  - 1. Base flashings and membrane terminations.
  - 2. Crickets, saddles, and tapered edge strips, including slopes.
  - 3. Insulation fastening and adhesive patterns.
- D. Tapered Insulation – Shop Drawings: Provide comprehensive panel layout of roof plans and sections as required to identify slopes in regard to hips, valley's, ridges and to all drain locations. Identify thickness of insulation in relation to all applicable existing conditions to include curb mounted equipment, parapet heights, door and structure elevation impacts, potential obstructions and ponding issues.
- E. Sheet Metal Detail Drawings:
  - 1. Include plans, elevations, sections and attachment details.
  - 2. Distinguish between shop and field assembly work.
  - 3. Include identification of finish for each item.
  - 4. Include pattern of seams and details of termination points, expansion joints and expansion joint covers, direction of expansion, roof penetration flashing, and connections to adjoining work.
- F. Verification Samples: Provide for each product specified.
- G. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- H. Maintenance Data for all products installed.
- I. Warranty: Provide manufacturer's current warranty specimen.
- J. Prior to beginning the work of this section, provide a copy of the final System Assembly Letter issued by the manufacturer indicating that the products and system to be installed will be eligible to receive the specified manufacturer's warranty when installed by a certified contractor/installer in accordance with the manufacturer's application requirements and inspected and approved by a manufacturer's Technical Representative.

- K. Prior to roofing system installation, provide a copy of the Warranty Application Confirmation document issued by the manufacturer indicating that the project has been reviewed for eligibility to receive the specified warranty and is registered.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's warranty with a minimum of five years of experience with work of this type.
- B. Manufacturer Qualifications: Qualified manufacturer that has previous applications for roofing system identical to that used for this Project with a minimum of 10 years of experience providing roofing systems of this type.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E329.
- D. Moisture Survey (Re-cover Roof Areas Only):
  - 1. Submit prior to installation, results of the non-destructive moisture survey test results as performed and completed by RDH Building Science Inc. Moisture Survey to utilize both of the following scanning processes:
    - a. Infrared Thermography Scanning.
    - b. Impedance Scanning.
- E. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system to be labeled by the single source roofing manufacturer issuing the warranty.
- F. Fire-Test-Response Characteristics: Roofing materials to comply with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer's 25-year total system warranty, No Dollar Limit System Warranty.
  - 1. Single-source special warranty to include roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
- B. Installer Warranty: Submit roofing Installer's warranty for the following period:
  - 1. Warranty Period: 2-years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Firestone

2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING MEMBRANE

- A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced.
  - 1. Membrane Thickness: 60-mil (nominal)
  - 2. Exposed Face Color: White

2.3 AUXILIARY ROOFING MATERIALS – SINGLE PLY

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  - 1. Liquid-type auxiliary materials to meet VOC limits of Authorities Having Jurisdiction.
- B. Sheet Flashing: Manufacturer's internally reinforced or scrim reinforced, smooth backed membrane with same thickness and color as sheet membrane.

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- C. Sheet Flashing (Self-Adhered): 60 mil (1.5 mm) thick, manufacturer's internally reinforced or scrim reinforced with weldable selvage edges on each side of roll, one encapsulated edge and self-adhering capabilities in a wide installation temperature range.
  - 1. Serviceable Installation Substrate Temperature: 20°F (-7°C) and rising.
- D. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
  - 1. Serviceable Installation Ambient Air Temperature: 25°F and rising
- E. Self-Adhered Primer: One-part penetrating primer solution to enhance the adhesion of self-adhering membranes.
- F. Liquid Applied Flashing: Manufacturer's single ply liquid and fabric reinforced flashing system created with a fleece polyester scrim and a two-component polyurethane based liquid applied flashing material, consisting of a liquid resin and a curing agent.
- G. Liquid Applied Flashing Primer: Manufacturer's single ply liquid flashing primer.
- H. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.
- I. Membrane Fasteners and Plates: Factory-coated steel fasteners and galvalume coated steel plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening TPO membrane materials to substrate, and acceptable to membrane roofing system manufacturer. Note: Attachment of TPO membrane and insulation at field of roof areas to be done with TPO Induction Welding Plates, see below description.
  - 1. Induction Welding Plate: Round specially coated galvalume plate with a recessed center and raised flat bonding surface specifically designed for induction welding application.
- J. Miscellaneous Accessories: Provide pourable sealers, primers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, cover strips, and other accessories approved by roofing system manufacturer and required for full installation.

## 2.4 WALKWAY PADS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer.

## 2.5 HIGH-DENSITY POLYISO COVER BOARD

- A. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs. of compressive strength.
  - 1. Thickness: 1/2 inch.
  - 2. R-value: 2.5.

2.6 TAPERED INSULATION AND/OR CRICKETING MATERIALS

- A. Tapered Insulation and/or Cricketing Materials, Where Required: ASTM C1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated on Drawings.

2.7 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- C. Insulation Fasteners and Induction Welding Plates: Factory-coated steel fasteners and galvalume coated steel plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening TPO membrane and insulation materials to substrate, and acceptable to membrane roofing system manufacturer. Note: Attachment of TPO membrane and insulation at field of roof areas to be done with TPO Induction Welding Plates.
  - 1. TPO Induction Welding Plate: Round specially coated galvalume plate with a recessed center and raised flat bonding surface specifically designed for induction welding application.
- D. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate, where required.
- E. Wood Nailer Strips.

2.8 EDGE METAL COMPONENTS

- A. Coping Metal System at Parapet Wall Conditions: Provide manufacturer's factory fabricated metal coping consisting of anchor bar and a snap-on cap components. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit warranty.
- B. All exposed sheet metal flashing to be minimum 24 gauge with Kynar 500 or Hylar 5000. Match existing colors.
- C. Drip & Rake Edge Metal Components: Provide TPO membrane clad drip and rake edge components where required, including at gutter drip edge conditions. Drip and rake edge components to include a continuous cleat on the outside exterior edge.
- D. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

**2.9 EXPANSION JOINT COMPONENTS**

- A. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product from single-source roofing system supplier that is included in the No Dollar Limit warranty.
- B. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

**2.10 MISCELLANEOUS MATERIALS**

- A. General: Provide materials and types of fasteners, solder, clinch lock, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Roof Drain Strainer Cover: Replace damaged roof drain strainer covers. Replacement covers to be cast iron only.
- C. Fasteners: Wood screws, annular threaded nails, self-tapping screws, bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  - 1. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
  - 2. Fasteners for Zinc Coated (galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.
- D. Solder - For Stainless Steel: ASTM B32, Grade Sn96, with acid flux of type recommended by stainless steel sheet manufacturer.
- E. Butyl Sealant Tape: 100 percent solids, asbestos free, butyl sealant tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch (13 mm) wide and 1/8 inch (3 mm) thick.
  - 1. Manufacturer: Schnee Morehead, Inc.; SM5227 Tacky Tape Sealant.

**PART 3 - EXECUTION****3.1 EXAMINATION GENERAL**

- A. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
- B. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses and elevation height of insulation and/or cover board materials.

**3.2 RECOVER PREPARATION**

- A. Overall Roof Plan Pages and Key Plan: Refer to Drawings, including Key Plan and Overall Roof Plan, for identification of roof related work that falls under this specification.
- B. Existing BUR Roofing System to Remain in Place: Existing roofing system is to remain in place. Existing Roof Core Results: Existing roof system consists of one (1) Tremco BUR roof system with pea-gravel and insulation over plywood roof deck substrate. Maximum thickness is approximately 2-1/2”.
- C. Existing Roof Preparation: At all existing roof areas, power broom and remove any loose pea-gravel materials. Using a spud-bar remove any high-spots and make the existing roof substrate relatively smooth prior to the installation of the new cover board materials. Prepare existing roof according to roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer, and requirements in this Section.
- D. Disable Existing Roofing System: Disable existing roof membrane system per manufacturer’s written instructions and requirements.
- E. Existing Roof Base Flashings: Tear out, remove, and discard of all existing roof base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of the new cover board and roof membrane system.
- F. Existing Roof System Wet or Damaged Materials: Remove and replace with new any wet and/or compromised existing materials, including any materials identified with moisture per the roof moisture survey results. New infill materials to match the elevation height of the existing roofing system.
- G. Abandoned Equipment and/or Penetrations: Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations. Where necessary, infill and install new plywood roof deck sheathing. New sheathing to match existing.
- H. Existing Equipment Curbs: Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
  - 1. Modify curbs as required to provide a minimum 8-inch base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
  - 2. Secure top of flashing and install new metal counterflashing prior to re-installation of unit.
- I. Remove Debris Prior to New Roof Installation: Clean and remove from substrate any sharp projections, dust, debris, moisture, and other substances detrimental to new roofing installation and in accordance with roofing system manufacturer's written instructions. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove all debris from roof surface prior to new roof installation. Demolished roof system materials may not be stored on the roof surface.
- J. Unsatisfactory Conditions: Proceed with installation only after unsatisfactory conditions have been corrected.



### 3.3 TAPERED CRICKET INSULATION INSTALLATION

- A. Protection: Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Tapered Insulation and/or Tapered Cricketing Materials: Where defined on the Drawings, install tapered insulation and/or tapered cricketing materials under area of roofing to conform to slopes indicated. Materials are initially loose laid into position.

### 3.4 COVER BOARD INSTALLATION

- A. Protection: Coordinate installation of membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Polyiso Cover Board, Mechanically Fastened: Mechanically attach cover board using #15 High Load Fasteners or #14 All Purpose Fasteners, and rhino plates. Fastening density of cover board to be 6/10/15 fasteners and rhino plates per 4' x 8' panel at field/perimeter/corner locations.
- D. Staggered Joints Cover Board: Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch with cover board.
  - 1. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations.
- E. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

### 3.5 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
- B. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
  - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.
  - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
  - 3. Remove and discard temporary seals before beginning work on adjoining roofing.

**3.6 INDUCTION WELDED TPO ROOFING MEMBRANE INSTALLATION**

- A. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roofing membrane and allow to relax before installing.
- C. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Apply roofing membrane with side laps shingled with roof slope, where possible.
- E. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
  - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
  - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas. Remove and repair any unsatisfactory sections before proceeding with Work.
  - 3. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.
- F. Induction Welding Installation:
  - 1. Perform calibration and set-up as detailed by the Induction Welder Owner's Manual
  - 2. Center the Induction Welder over the first plate in pattern and activate the weld.
    - a. Induction Welder to be centered over the plate to create a 100% bond.
    - b. If an error occurs during activation, refer to the induction welder owner's manual for corrective action.
  - 3. Prior to every use, clean face of Heat Sink Magnet.
  - 4. Place Heat Sink Magnet over the welded plate.
    - a. Keep Heat Sink Magnet in place at least 45 seconds while the assembly cools.
  - 5. Repeat process for each plate.
- G. Perimeter and Corner Membrane Enhancements: Perimeter and corner membrane enhancements are required at all exposed roof edge perimeters and corners.
  - 1. Formulas for determining dimensions of perimeters and corners are as follows: Use 10% of the lesser plan dimension, or 40% of the roof elevation height, whichever is the lesser.
  - 2. Use rhino plates and the induction welding process for creating perimeter and corner enhancements.
- H. At drains, spread sealant or mastic bed over deck drain flange and securely seal roofing membrane in place with clamping ring.

3.7 MEMBRANE BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates in accordance with membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 DRIP AND RAKE EDGE FLASHINGS:

- A. Drip and Rake Edge Metal Flashings: At drip and rake edge conditions, including where gutter conditions exist, install new TPO membrane clad drip and rake edge metal flashings, where required.
- B. Drip and rake edge materials to incorporate a continuous cleat installed on the outside vertical face.
- C. Flash in and make watertight using 6-inch wide TPO Cover Strip.
- D. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

3.9 COPING METAL AT PARAPET WALL CONDITIONS:

- A. At parapet wall conditions where coping metal is required, install new coping metal materials.
- B. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

3.10 EXPANSION JOINT INSTALLATION

- A. At top of wall expansion joint conditions where they presently existing, install expansion joint covers; Type TPO EJ/WC Heat Welded.
- B. Install in accordance with manufacturer's written instructions.
- C. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

3.11 WALKWAY PAD INSTALLATION

- A. TPO Hot-Air Weldable Walkway Pads: Install walkway pads at locations indicated on the Architectural Roof Plan Pages.
- B. Install in accordance with manufacturer's written instructions.

3.12 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Consultant.
  - 1. Notify Consultant or Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.13 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075423



**TECH/NORTHWEST, INC.**

ROOF CONSULTING, MOISTURE TESTING & ANALYSIS

# **ROOF INSPECTION REPORT**

*(Limited Visual Inspection)*

*Conducted For:*

**BEAVERTON SCHOOL DISTRICT**

Beaverton, Oregon

*Facility Inspected:*

**Elmonica Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary**

**Project Number: 20054**

**March 16, 2020**



## ROOF INSPECTION REPORT

*(Limited – Visual)*

**Inspection Date:** March 16, 2020  
**Project #:** 20054

**Inspection #:** V-01  
**Report Date:** 3/26/20

**Company:** BEAVERTON SCHOOL DISTRICT  
16550 SW Merlo Road  
Beaverton, OR 97003-5152

**Attn:** Megan Finch  
Project Manager  
503-356-4587  
[Megan\\_Finch@beaverton.k12.or.us](mailto:Megan_Finch@beaverton.k12.or.us)

**Inspected Facility:** Elmonico Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary

**Present at Inspection:** Megan Finch..... Beaverton School District  
Patrick Schmutz..... A-Tech/Northwest, Inc.  
Doug Coddington..... A-Tech/Northwest, Inc.

### **PART I - DISCUSSION**

#### **A. PURPOSE:**

1. The purpose of the inspection is to review the existing condition of the roofs at the five (5) schools.
  - a. The available history of the building is minimal. This report is based on the information supplied and this visual inspection.
  - b. One (1) core sample was cut at each school to determine the general roof construction / component data.
2. The following is a summary review of the results of this inspection.

#### **B. GENERAL ROOF/BUILDING INFORMATION:** *(Refer to as-built drawings for Roof ID's)*

##### **1. Elmonica Elementary School – Modular Building**

###### **a. Built-up Roofs (Roofs I-DD):**

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2003 (*17 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

2. Errol Hassell Elementary School – Modular Building

a. Built-up Roofs (Roofs I-V):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... Reported to be 2001 or 2009 (*11 or 19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

3. Hiteon Elementary School

a. Built-up Roofs (Roofs A-L):

- (1) Roof Type:..... Pea Gravel Built-up Roof (*Roof-over-roof*)
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... ½" Fiberboard Top Roof (*R Value 1.4 approx.*)  
¾" Perlite Bottom Roof (*R-Value 2 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2004 (*16 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

4. Montclair Elementary School

a. Built-up Roofs (Roofs A-H):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2009 (*11 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

5. Jacob Wismer Elementary School

a. Built-up Roofs (Roofs A-I):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2001 (*19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

**C. INTERIOR LEAKAGE:**

1. Elmonica Elementary School:
  - a. No current interior leakage reported. Previous interior leakage reported at equipment at a few locations.
2. Errol Hassell Elementary School:
  - a. Current interior leakage at repair area at northeast section of the building. Previous interior leakage reported at a few pipes in the roof field.
3. Hiteon Elementary School:
  - a. No current interior leakage reported.
4. Montclair Elementary School:
  - a. Current interior leakage reported at several locations.
5. Jacob Wismer Elementary School:
  - a. Current interior leakage reported along parapet at southwest section of the building and at west section of the building.

**PART II - RE-ROOF OPTIONS**

**A. Single-ply Roof System Types Recommended: (in the following order)**

1. Mechanically attached TPO (minimum 60 mil).
2. Fully adhered TPO (minimum 60 mil).
3. Mechanically attached EPDM (minimum 60 mil).
4. Fully adhered EPDM (minimum 60 mil).

**B. Coating:**

1. Coating is not recommended for these roofs due to gravel and condition of the existing roofs.

**PART III – BUDGET ESTIMATE**

**A. Remove and Replace:**

|                                           |                                    |
|-------------------------------------------|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 500,000.00 to \$ 550,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 300,000.00 to \$ 350,000.00     |
| 3. Hiteon Elementary School:.....         | \$ 1,260,000.00 to \$ 1,550,000.00 |
| 4. Montclair Elementary School:.....      | \$ 1,100,000.00 to \$ 1,350,000.00 |
| 5. Jacob Wismer Elementary School:.....   | \$ 1,300,000.00 to \$ 1,600,000.00 |

**B. Recover:**

|                                           |                                    |
|-------------------------------------------|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 460,000.00 to \$ 490,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 270,000.00 to \$ 290,000.00     |
| 3. Hiteon Elementary School:.....         | n/a (roof-over-roof)               |
| 4. Montclair Elementary School:.....      | \$ 850,000.00 to \$ 1,000,000.00   |
| 5. Jacob Wismer Elementary School:.....   | \$ 1,000,000.00 to \$ 1,200,000.00 |





If you have any questions concerning this inspection and/or the report, please contact our office.  
The opportunity to submit this information is appreciated.

Respectfully submitted,

**A-Tech/Northwest, Inc.**

*Doug Coddington* (electronic)

Doug Coddington, RCI  
Vice President

Attachment: Photo Section  
As-Built Drawings

Copy to: Master Files

**- End of Report -**



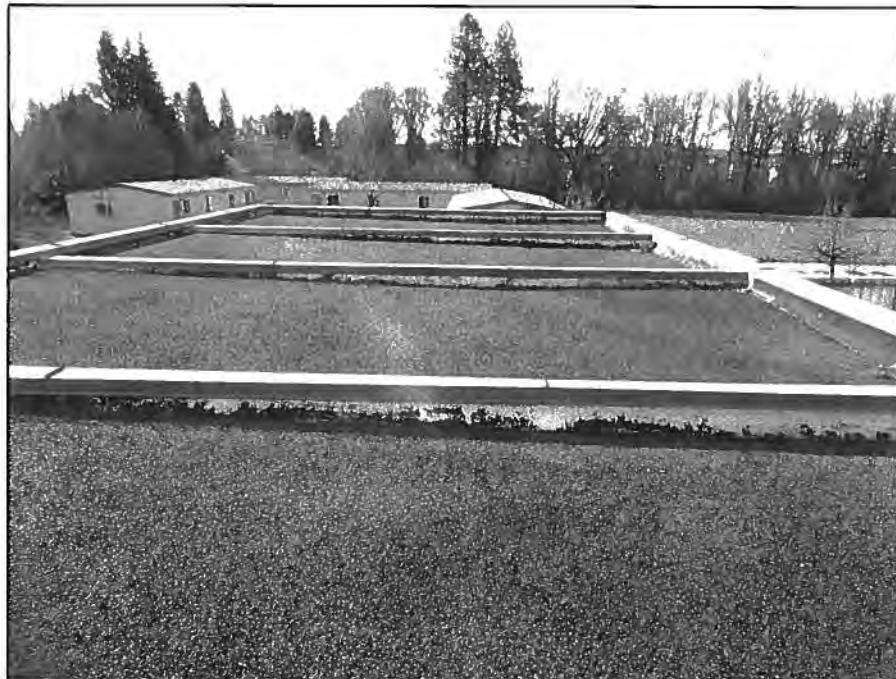
**EE. 1.01 – View to south of the front elevation of Elmonica Elementary school.**



**EE. 1.02 – View to northeast of roof top equipment at the north section of roof.**

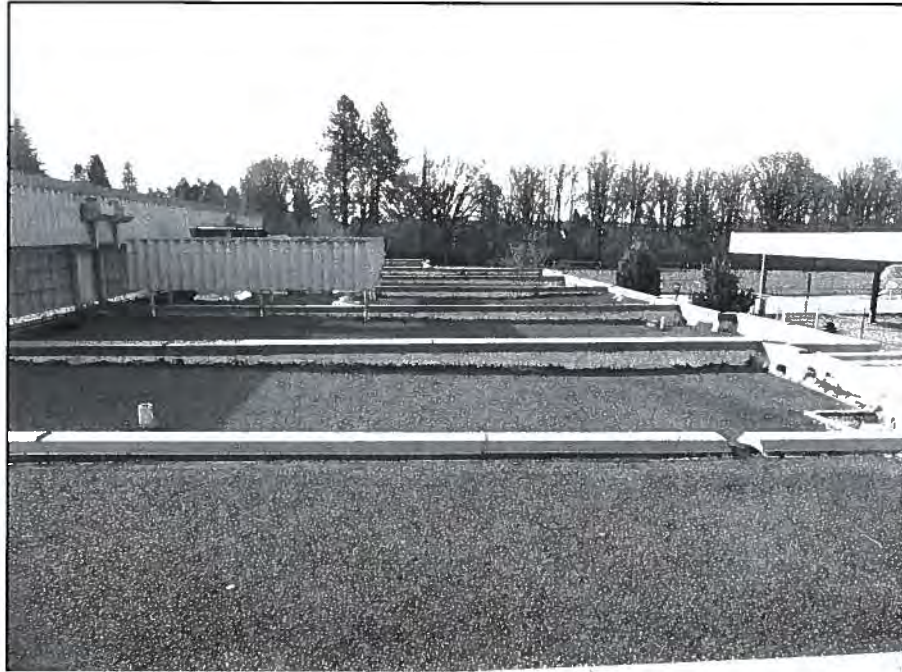


**EE. 1.03 – View of typical roof drain & overflow scupper with previous repairs starting to fail.**



**EE. 1.04 – View to the south of the upper section of the roof.**





**EE. 1.05 – View to the west of the north section of the roof.**



**EHE. 1.01 – View to south of the front elevation of Errol Hassell Elementary school.**

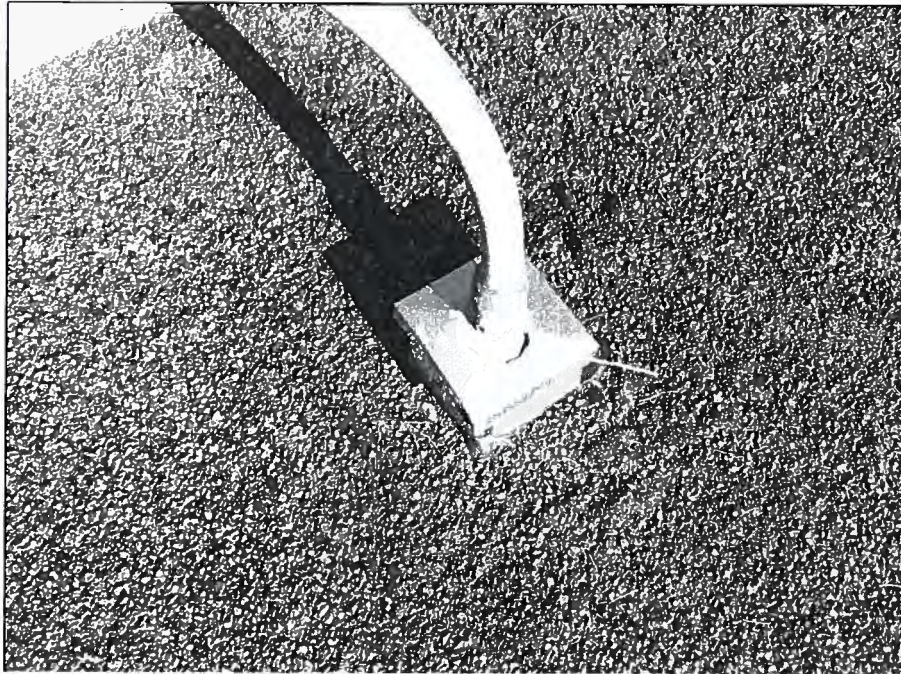


**EHE. 1.02 – View to the west of the north section of the roof.**



**EHE. 1.03 – View of repair at current interior leakage area at northeast section of the roof.**

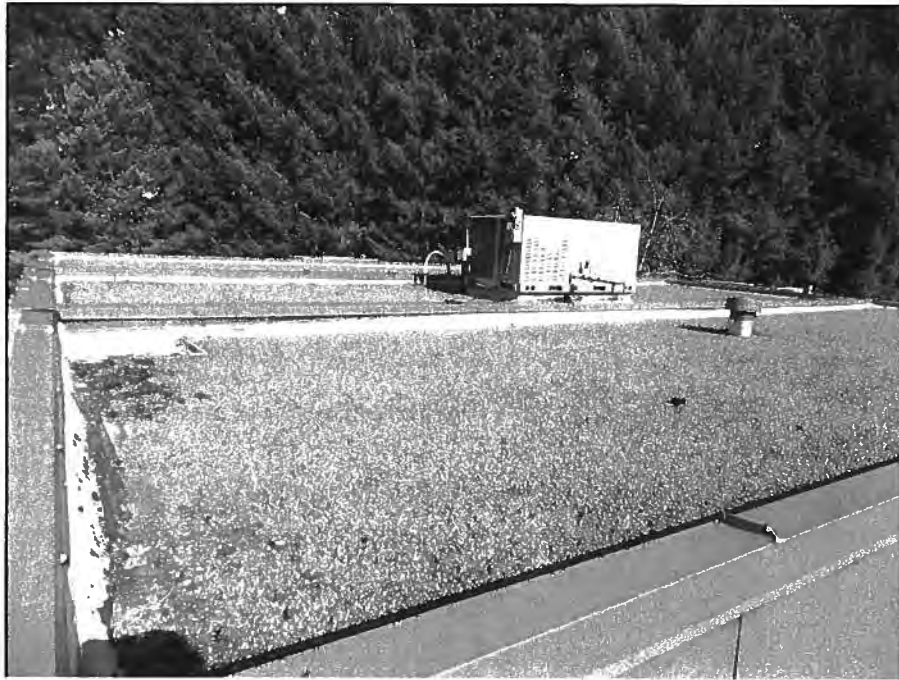




**EHE. 1.04 – View of void in the cap of penetration flashing at northeast section of roof.**



**EHE. 1.05 – View of typical roof drain scupper with splits and coating deterioration.**

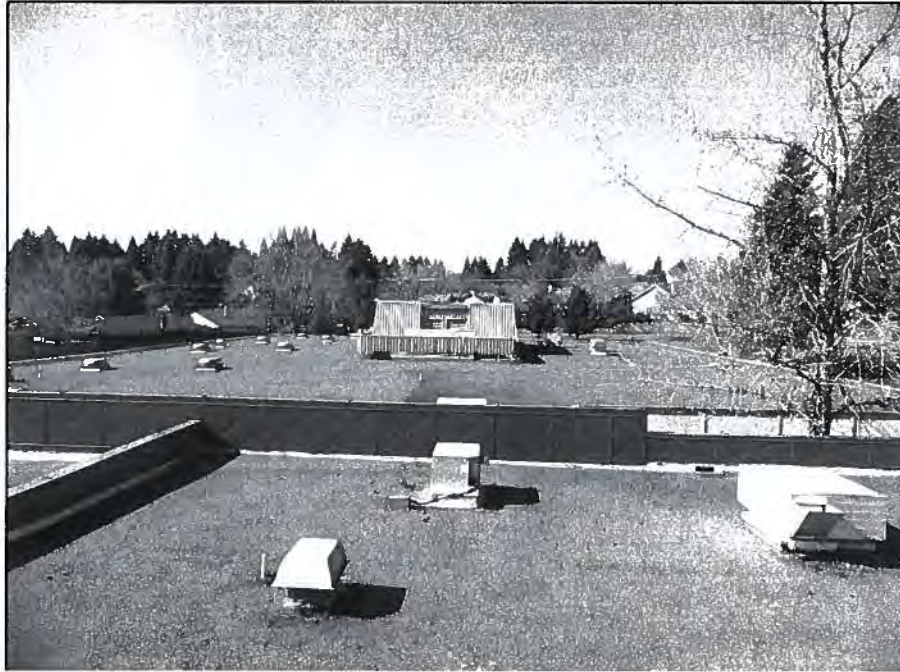


**EHE. 1.06 – View to northwest of the upper roof areas.**

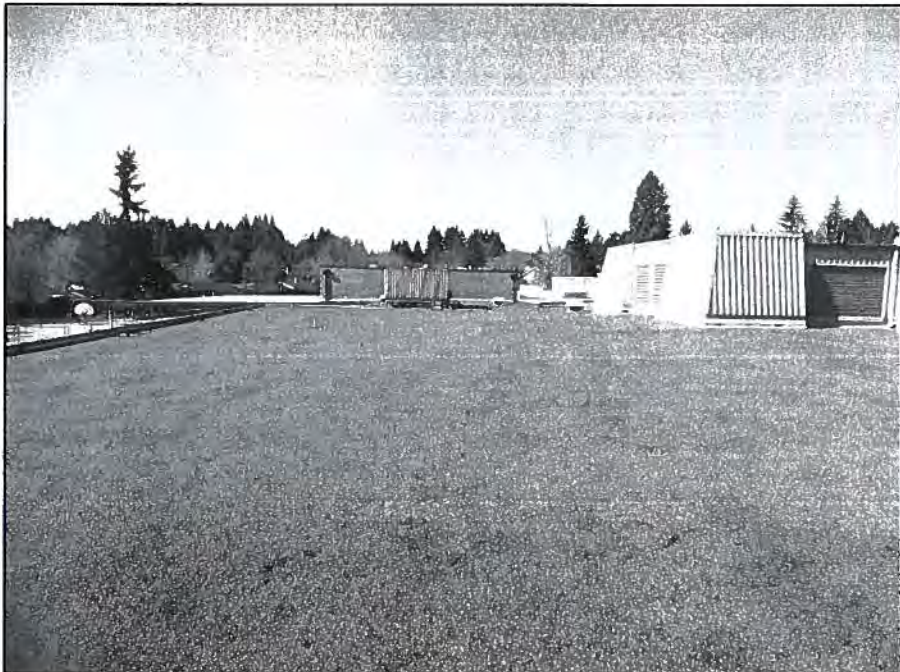


**HE. 1.01 – View to west of the front elevation of Hiteon Elementary school.**





**HE. 1.02 – View to west at the west section of the roof.**



**HE. 1.03 – View to the west of the southeast section of roof.**





**HE. 1.04 – View of typical roof drain and overflow drain at the east section of the roof.**



**HE. 1.05 – View of typical roof drain and overflow scupper at the northwest section of the roof.**



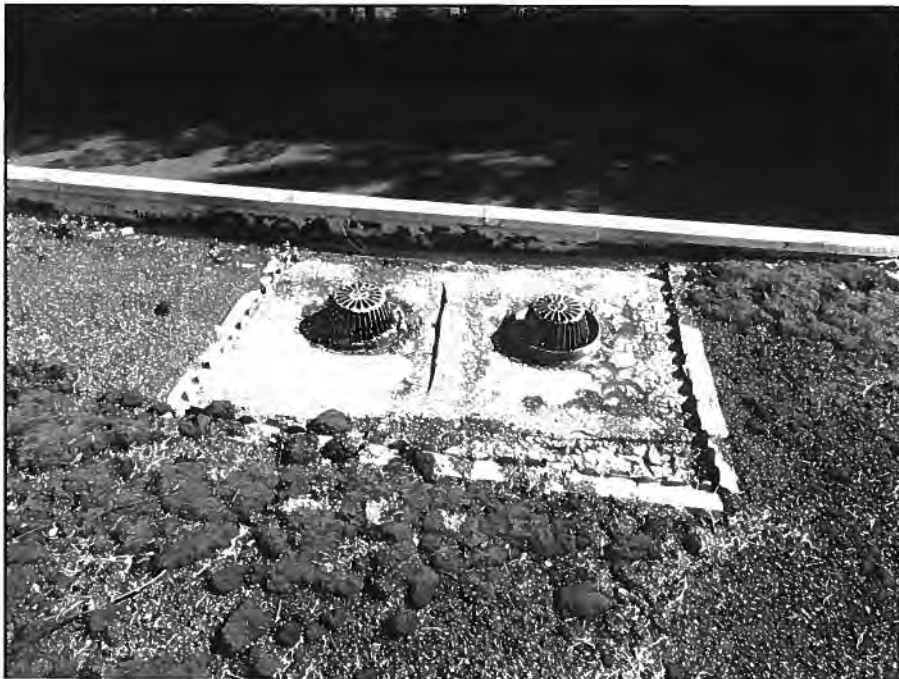
**HE. 1.06 – View to the west of coated roof system at the covered playground section of roof.**



**ME. 1.01 – View to south of front elevation of Montclair Elementary school.**



**ME. 1.02 – View to east at southwest section of the roof with ponding water and moss build-up.**



**ME. 1.03 – View of typical roof drain and overflow drain with evidence ponding water and moss build-up at the east section of the roof.**

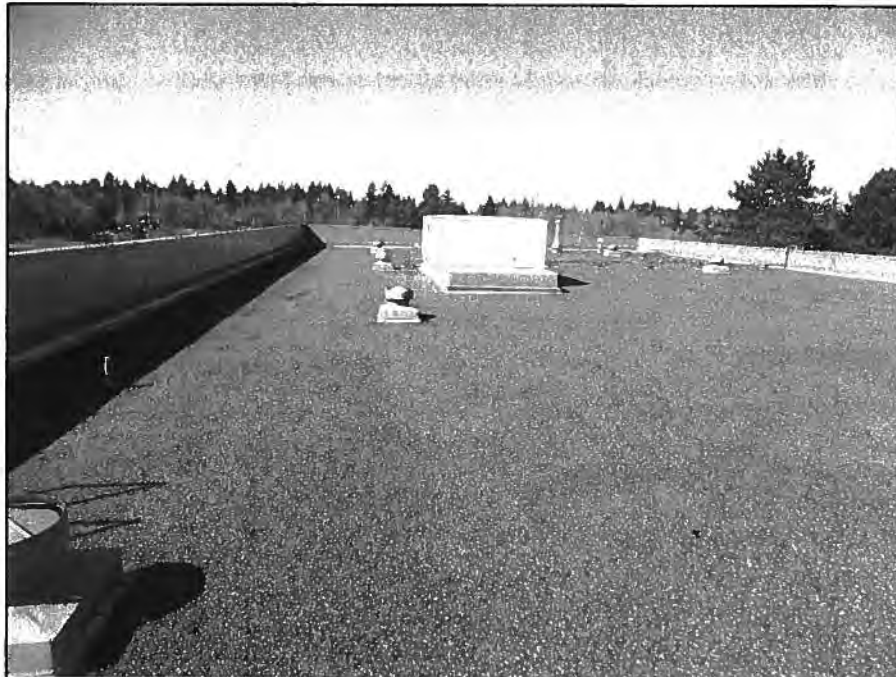




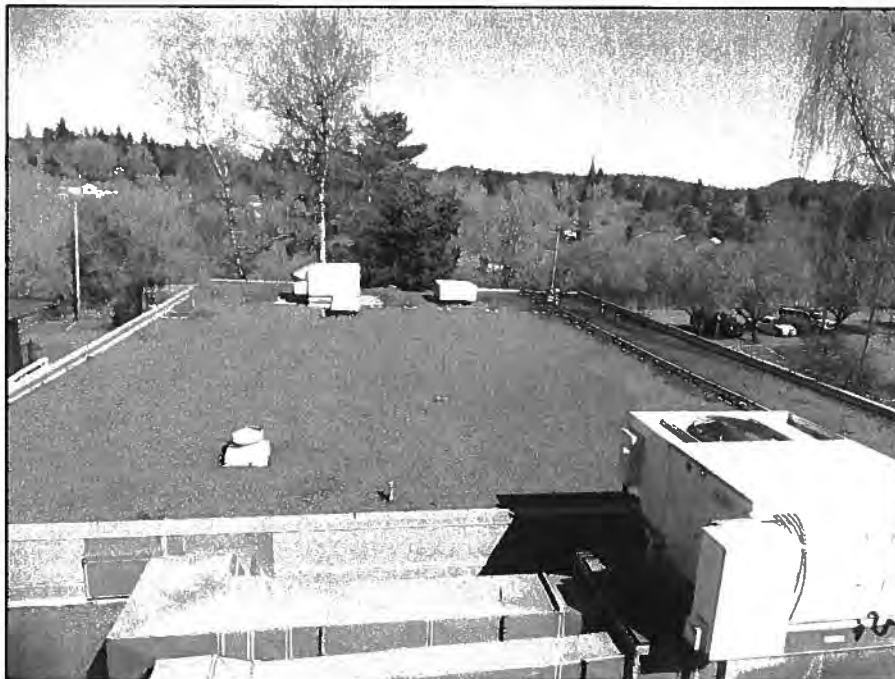
**ME. 1.04 – View to the east at the north section of the roof.**



**ME. 1.05 – View of typical repairs at the east section of the roof.**



**ME. 1.06 – View to west with ponding water and moss build-up along south section of roof.**

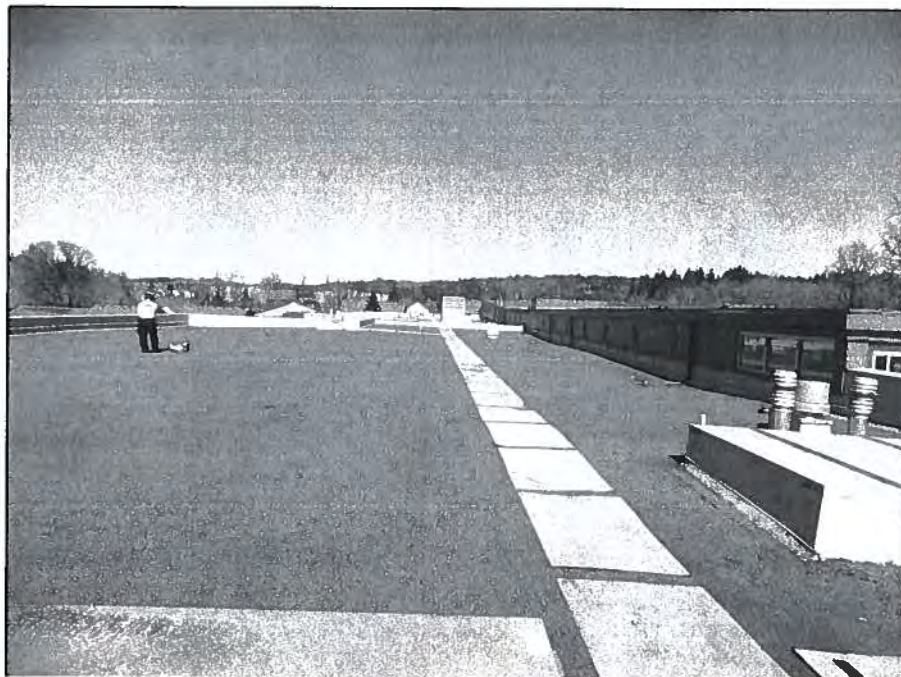


**ME. 1.07 – View to the north of northwest roof with evidence of moss build-up.**

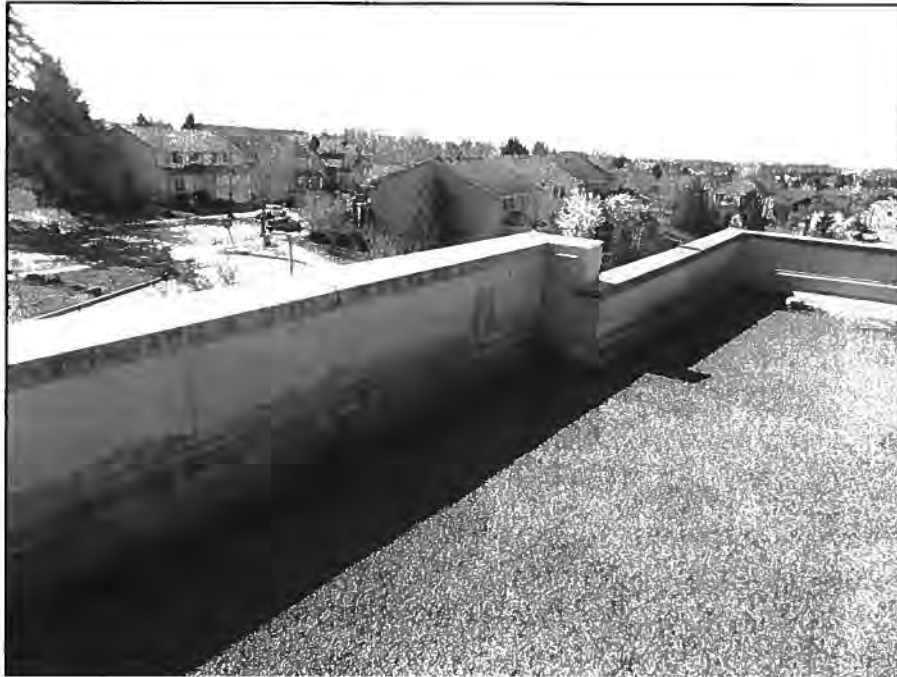




**JWE. 1.01– View to north of the front elevation of Jacob Wismer Elementary school.**



**JWE. 1.02– View to north of the southwest section of roof.**

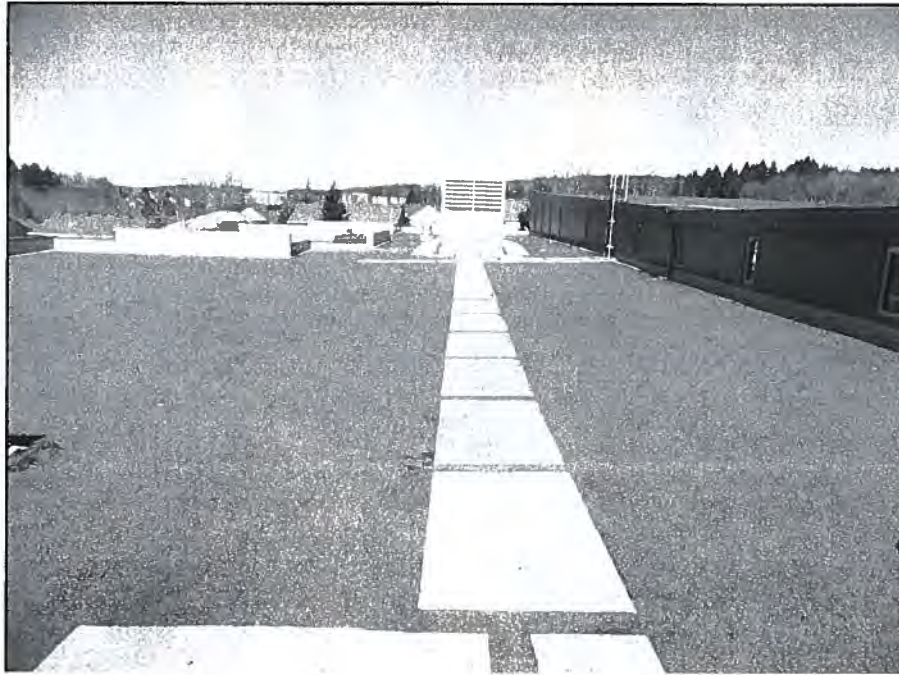


**JWE. 1.03– View of typical wall metal and coping flashing at the southwest section of roof, area has had previous leaks.**



**JWE. 1.04– View of typical roof drain and overflow drain at the west section of the roof.**





**JWE. 1.05– View to the north at the northwest section of roof.**



**JWE. 1.06 – View of fiberglass exposed in membrane at large roof top unit at the northwest section of the roof.**





**JWE. 1.07– View of moss and organic debris on roof at the southeast section of roof area.**

**- End of Photo Section -**

17347 37-25-17 Central SD Central High School V05 18 Photo

SW Lisa Ct

Roof KK

Roof JJ

Parking

Parking

SW 170th Ave

Roof II

Roof B

Roof A

Main Entrance

Roof E

Roof F

Roof D

Roof C

Play ground

Roof EE

Roof FF

Roof HH

Roof GG

Roof H  
Roof I  
Roof J  
Roof K  
Roof L  
Roof M  
Roof N  
Roof O  
Roof P  
Roof Q  
Roof R  
Roof S  
Roof T  
Roof U  
Roof V  
Roof W  
Roof X  
Roof Y  
Roof Z  
Roof AA  
Roof BB  
Roof CC  
Roof DD

Single-ply  
ROOF AREA SQ.FT.  
(Approximate)

Roof A: 26,654 sf  
Roof B: 7,470 sf  
Roof C: 5,550 sf  
Roof D: 3,891 sf  
Roof E: 559 sf  
Roof F: 673 sf  
Roof G: 4,884 sf  
Total: 49,681 sf

Gravel  
ROOF AREA SQ.FT.  
(Approximate)

Roof B: 1,251 sf  
Roof I: 346 sf  
Roof J: 298 sf  
Roof K: 298 sf  
Roof L: 550 sf  
Roof M: 509 sf  
Roof N: 509 sf  
Roof O: 448 sf  
Roof P: 396 sf  
Roof Q: 450 sf  
Roof R: 450 sf  
Roof S: 450 sf  
Roof T: 713 sf  
Roof U: 374 sf  
Roof V: 340 sf  
Roof W: 499 sf  
Roof X: 478 sf  
Roof Y: 478 sf  
Roof Z: 421 sf  
Roof AA: 477 sf  
Roof BB: 477 sf  
Roof CC: 495 sf  
Roof DD: 495 sf  
Total: 10,828 sf

Comp Shingle  
ROOF AREA SQ.FT.  
(Approximate)

Roof EE: 2,076 sf  
Roof FF: 2,110 sf  
Roof GG: 1,979 sf  
Roof HH: 1,934 sf  
Roof II: 2,074 sf  
Roof JJ: 1,034 sf  
Roof KK: 1,026 sf  
Total: 12,233 sf

Roof Total: 72,742 sf

Elmonica Elementary School  
16950 SW Lisa Ct  
Beaverton, OR

BEAVERTON SCHOOL DISTRICT  
Elmonica Elementary School - Beaverton, OR

SCALE: NTS  
DATE: 3/30/2020  
DRAWN BY: DVG  
REVISED:  
PROJECT NUMBER:  
20054

A-TECH/NORTHWEST, INC.  
Portland & Pineville, Oregon 503-628-2882

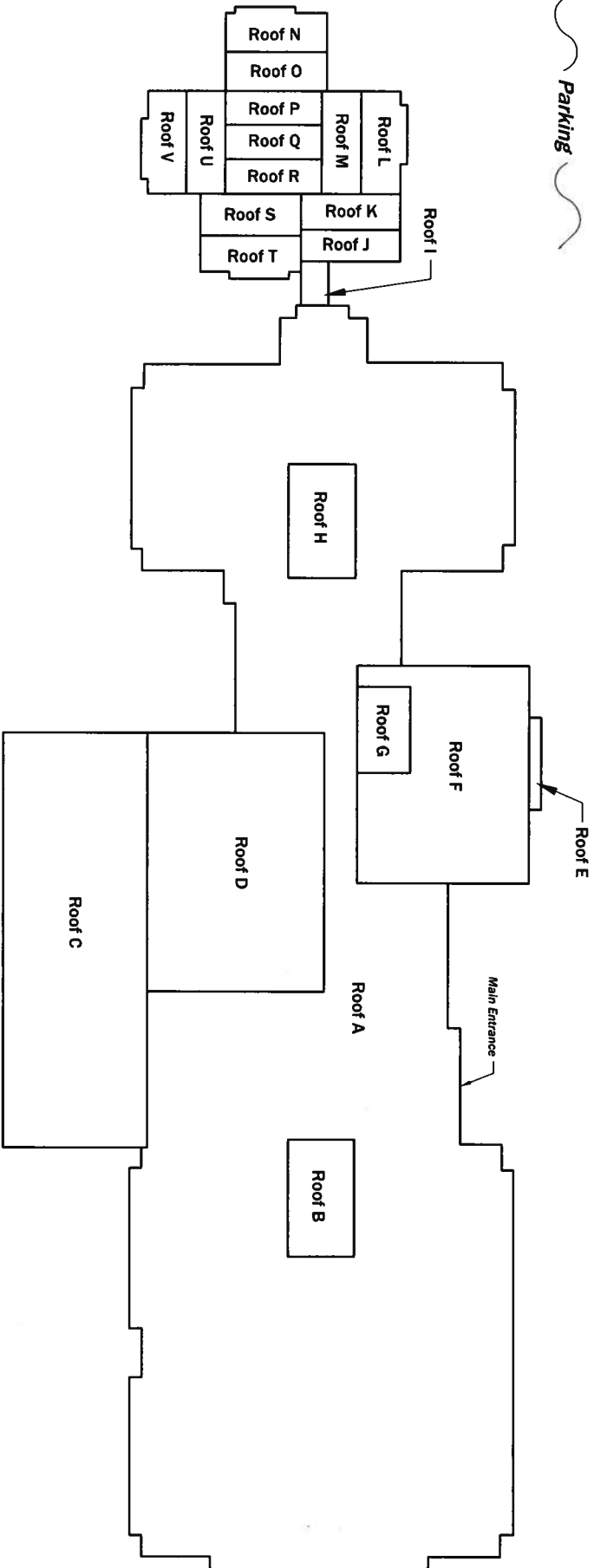
As-Built Drawing

SW Bany Rd

Parking

Parking

Play ground



Single-ply  
ROOF AREA SQ.FT.  
(Approximate)

|         |           |
|---------|-----------|
| Roof A: | 37,808 sf |
| Roof B: | 932 sf    |
| Roof C: | 7,178 sf  |
| Roof D: | 5,462 sf  |
| Roof E: | 133 sf    |
| Roof F: | 3,919 sf  |
| Roof G: | 537 sf    |
| Roof H: | 924 sf    |
| Total:  | 56,893 sf |

Gravel  
ROOF AREA SQ.FT.  
(Approximate)

|         |          |
|---------|----------|
| Roof I: | 147 sf   |
| Roof J: | 375 sf   |
| Roof K: | 422 sf   |
| Roof L: | 527 sf   |
| Roof M: | 487 sf   |
| Roof N: | 519 sf   |
| Roof O: | 475 sf   |
| Roof P: | 391 sf   |
| Roof Q: | 400 sf   |
| Roof R: | 400 sf   |
| Roof S: | 505 sf   |
| Roof T: | 484 sf   |
| Roof U: | 473 sf   |
| Roof V: | 522 sf   |
| Total:  | 6,124 sf |

Errol Hassell Elementary School  
18100 SW Bany Rd  
Beaverton, OR

Roof Total:

63,017 sf

BEAVERTON SCHOOL DISTRICT  
Errol Hassell Elementary School - Beaverton, OR

SCALE: NTS

DATE: 3/20/2020

1 of 1

DRAWN BY: DIV:6

REVISED

A-TECH/NORTHWEST, INC.

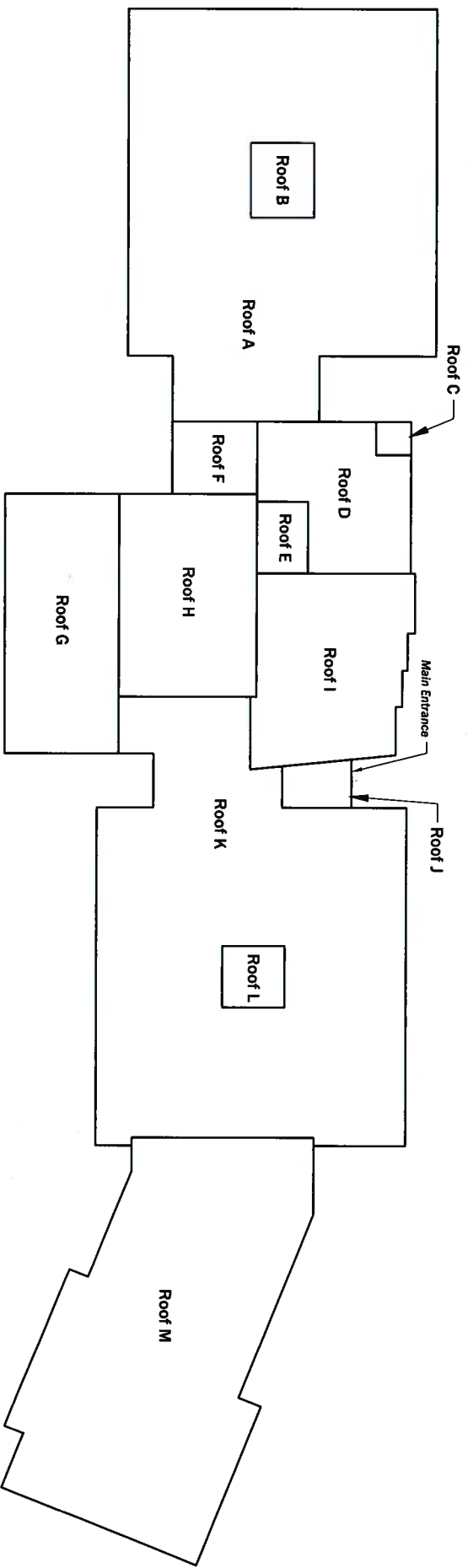
Portland & Pineville, Oregon 503-628-2892

As-Built Drawing

PROJECT NUMBER  
20054

SW Davies Rd

SW Brockman Rd



Gravel  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof A: | 22,200 sf |
| Roof B: | 936 sf    |
| Roof C: | 233 sf    |
| Roof D: | 3,709 sf  |
| Roof E: | 722 sf    |
| Roof F: | 1,223 sf  |
| Roof H: | 5,533 sf  |
| Roof K: | 22,537 sf |
| Roof L: | 746 sf    |
| Total:  | 57,839 sf |

Single-ply  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof G: | 5,747 sf  |
| Roof I: | 5,690 sf  |
| Roof J: | 627 sf    |
| Roof M: | 16,412 sf |
| Roof N: | 1,330 sf  |
| Total:  | 29,806 sf |

Roof Total:

87,645 sf

Hiteon Elementary school  
13800 SW Brockman Rd  
Beaverton, OR

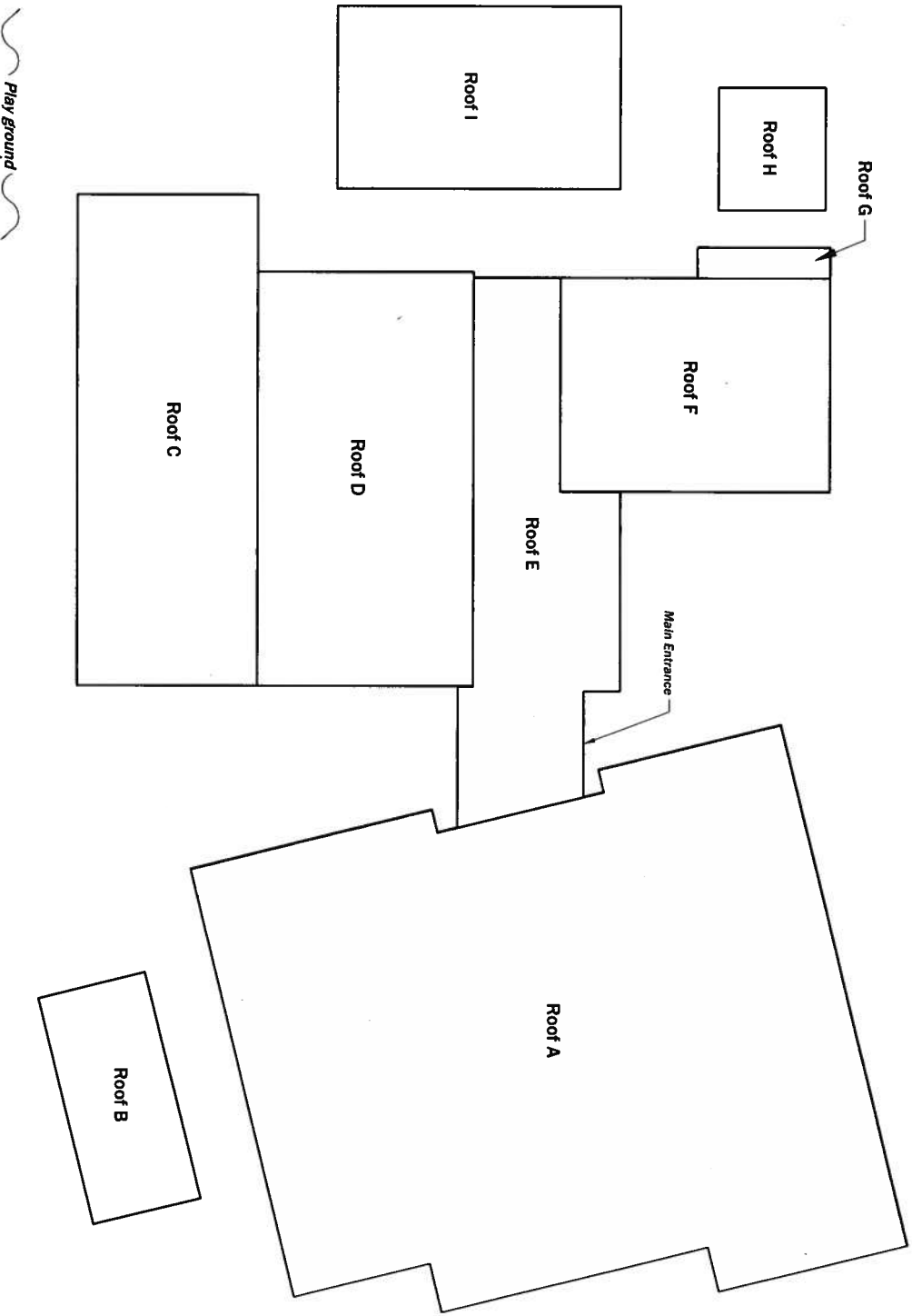


**BEAVERTON SCHOOL DISTRICT**  
Hiteon Elementary school - Beaverton, OR

|                                            |                 |        |                       |
|--------------------------------------------|-----------------|--------|-----------------------|
| SCALE: NIS                                 | DATE: 3/30/2020 | 1 of 1 | DRAWN BY: D.Y.A.      |
| A-TECH/NORTHWEST, INC.                     |                 |        | PROJECT NUMBER: 20054 |
| Portland & Primeville, Oregon 503-628-2882 |                 |        |                       |
| As-Built Drawing                           |                 |        |                       |

SW Vermont St →

Parking



Montclair Elementary School  
7250 SW Vermont St  
Portland, OR

|                  |           |
|------------------|-----------|
| Gravel           |           |
| ROOF AREA SQ.FT. |           |
| (Approximate)    |           |
| Roof A:          | 23,323 sf |
| Roof B:          | 1,989 sf  |
| Roof C:          | 6,988 sf  |
| Roof D:          | 7,034 sf  |
| Roof E:          | 4,971 sf  |
| Roof F:          | 4,542 sf  |
| Roof G:          | 323 sf    |
| Roof H:          | 1,013 sf  |
| Total:           | 50,183 sf |
| Single-ply       |           |
| ROOF AREA SQ.FT. |           |
| (Approximate)    |           |
| Roof I:          | 4,028 sf  |
| Roof Total:      | 54,211 sf |

BEAVERTON SCHOOL DISTRICT

Montclair Elementary School - Portland, OR

SCALE: NTS

DATE: 3/30/2020

1 of 1

Drawn by: D.L.G.

REVIEWED:

A-TECH/NORTHWEST, INC.

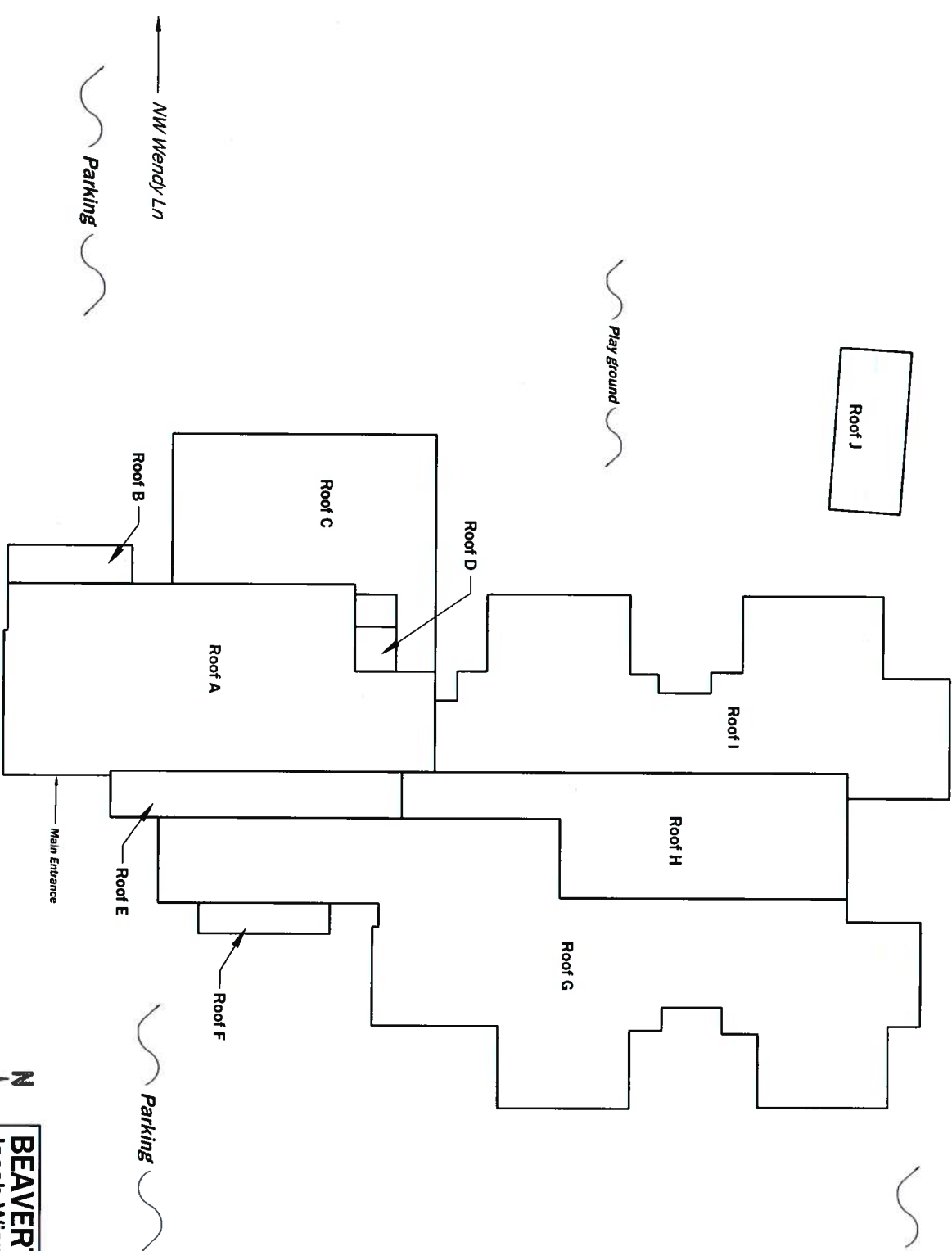
Portland & Prineville, Oregon 503-628-2882

PROJECT NUMBER

20054

As-Built Drawing

Jacob Wismer Elementary School  
5477 NW Skycrest Pkwy  
Portland, OR



Gravel  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof A: | 11,574 sf |
| Roof B: | 731 sf    |
| Roof C: | 6,779 sf  |
| Roof D: | 291 sf    |
| Roof E: | 2,111 sf  |
| Roof F: | 622 sf    |
| Roof G: | 19,154 sf |
| Roof H: | 6,804 sf  |
| Roof I: | 11,582 sf |
| Total:  | 59,648 sf |

Comp Shingle  
ROOF AREA SQ.FT.  
( Approximate )

|             |           |
|-------------|-----------|
| Roof J:     | 1,794 sf  |
| Roof Total: | 61,442 sf |

BEAVERTON SCHOOL DISTRICT  
Jacob Wismer Elementary School - Portland, OR

|                                            |        |                  |
|--------------------------------------------|--------|------------------|
| SCALE: NS                                  | 1 of 1 | DRAWN BY: D.J.G. |
| DATE: 3/30/2020                            |        | REVISED:         |
| A-TECH/NORTHWEST, INC.                     |        |                  |
| Portland & Prineville, Oregon 503-628-2882 |        |                  |
| As-Built Drawing                           |        |                  |
| PROJECT NUMBER: 20054                      |        |                  |



To CIDA  
15895 SW 72<sup>nd</sup> Ave  
Portland, OR 97224

Submitted  
October 14th, 2020  
RDH Building Science Inc.  
5331 S Macadam Avenue #314  
Portland OR 97239





# Contents

|          |                                       |          |
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| 2.2      | Historic Information                  | 2        |
| 2.3      | Field Work                            | 2        |
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**Appendix A – Photos of Roof Conditions**

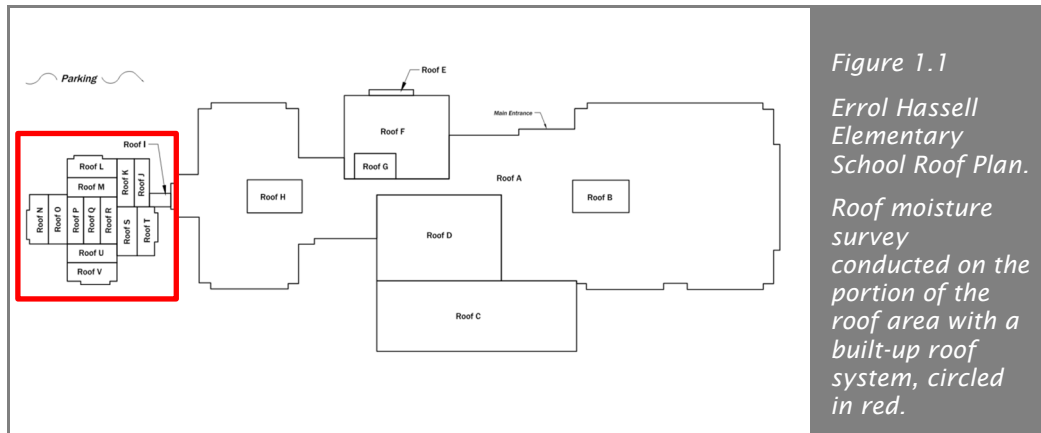
**Appendix B - Roof Plan - Impedance Scanning and Cores**



# 1 Project Background

RDH Building Science Inc. (RDH) was retained by CIDA on behalf of Beaverton School District (BSD) to perform a roof moisture survey on built-up roof systems at four (4) school campuses that are included in the BSD portfolio. BSD is planning a range of different re-roofing efforts for the 2021 summer season. The purpose of the work described in this report is a) to provide verification that existing built-up systems are acceptable for re-cover applications and that manufacturers' warranties can be provided, and b) that there are no hidden or unforeseen conditions associated with the existing built-up roof system. This report documents our findings at Errol Hassell Elementary School, located at 18100 SW Bany Rd, Beaverton OR 97007. Refer to Figure 1.1 for the extent of roof area surveyed.

This report documents data collection and observations from the roof moisture survey. This report has been undertaken for CIDA on behalf of BSD and is not to be relied on by others.



## 2 Data Collection

### 2.1 Document Review

The documents provided to and reviewed by RDH are listed in Table 2.1.

| TABLE 2.1 DOCUMENTS REVIEWED                                                                                                                        |                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| DOCUMENT DESCRIPTION                                                                                                                                | DOCUMENT PAGES                            |
| Document Type: Architectural Drawings<br>Title: BSD Errol Hassell Elementary School: 2021 Re-Roof<br>Author: CIDA<br>Issuance: SD set on 08/05/2020 | CS1, AD0.1, AD1.1, A1.1, A2.1, A3.1, S1.1 |
| Document Type: Report<br>Title: Roof Inspection Report<br>Author: A-Tech/Northwest, Inc.<br>Dated: 03/06/2020                                       | 1-26                                      |

We note the following relevant information that is related from review of the documents provided:

- The A-Tech NW report indicates a large repair patch at Roof J, which is an area of current leakage. CIDA and BSD plan to replace this roof system, so areas with leakage will be exposed.
- The report also indicates previous interior water leakage reported adjacent to pipe penetrations in multiple locations.
- The A-Tech NW report notes discontinuous sealant at penetrations and failed coating at drain areas.

## 2.2 Historic Information

A history of activities and events including past leakage and repairs relating to the existing roof assembly as reported to us or described in reviewed documents are listed in Table 2.2.

| TABLE 2.2 HISTORIC EVENTS RELATING TO EXISTING ROOF PERFORMANCE |                                                                                                |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| DATE                                                            | EVENT                                                                                          |
| 1980                                                            | Modular building construction (Test Area)                                                      |
| 2001                                                            | Tremco built-up roof system installation (Per A-Tech/NW report)                                |
| March 16, 2020                                                  | Current leakage reported at Roof J and previous leakage at some pipes through the roof surface |

## 2.3 Field Work

Relevant information pertaining to the field work performed during the roof moisture survey are included in Table 2.3.

| TABLE 2.3 DETAILS OF FIELD WORK      |                                                  |
|--------------------------------------|--------------------------------------------------|
| Dates of Roof Assessment: 2020/09/21 |                                                  |
| Impedance Testing                    | Yes                                              |
| Infrared Scanning                    | No                                               |
| Test Cuts                            | No                                               |
| Method of Roof Access                | Access Hatch                                     |
| RDH Staff in Attendance              | Cameron Chorney<br>Shinji Coram<br>Scott Mecalis |
| Other Parties in Attendance          | None                                             |

## 2.4 Existing Roof System

General information and specific components of the existing roof system, according to the reviewed documents, are listed in Table 2.4.

| TABLE 2.4 EXISTING ROOF SYSTEM |                                     |
|--------------------------------|-------------------------------------|
| Roof Age                       | Approximately 19 years              |
| General Roof Assembly          |                                     |
| Deck Type                      | Plywood                             |
| Vapor Barrier                  | None reported                       |
| Insulation                     | 2" Paper-faced polyisocyanurate     |
| Cover Board                    | ½" Fiberboard                       |
| Roof Membrane                  | Hot-mopped asphalt built-up roofing |
| Ballast                        | Pea Gravel                          |
| Protection Course              | N/A                                 |
| Means of Drainage              | Through-Wall Scupper                |
| Approximate Roof Area          | 6,124 Sq. Ft.                       |
| Warranty Available (Y/N)       | No                                  |

## 3 Observations and Field Testing

### 3.1 Visual Observations

We made the following visual observations during our time on site. Refer to Appendix A for photographic examples of the conditions listed below.

- Embedded flashings along the perimeter, at drains, and at penetrations contain metal that resulted in inconsistent impedance readings at these areas.
- Mechanical equipment curbs are detailed with membrane flashing, metallic paint, and metal flashing. Water is draining onto the roof surface at a rooftop unit condensate line at Roof K.
- In general, the roofing membrane is in fair condition.
- There are minor areas of moss/organic growth near RTUs (rooftop units) and along the perimeter. Moss/organic growth was cleared to allow impedance scanning in these areas.
- Each roof section drains via a through-wall scupper and downspout at one of the corners. Scuppers typically measure 2" x 4". We observed organic debris at scuppers that could block drainage. The metallic coating is cracking at the drain pans.
- The three high roof sections, Roof P, Q, and R, drain onto the roof to the immediate south, Roof U.
- The connector roof, Roof I, drains via a gutter and downspout on the north edge.
- Some cracking of the repair patch is present at the known area of damage at Roof J. We did not observe staining, cracking, splitting, or open lap joints at any other areas.

- We marked one air bubble/blister of the roof membrane at Roof P. Refer to Appendix B for the blister location.
- Perimeter parapets and curbs separating modular roof areas are detailed with membrane flashing, metallic paint, and standing seam metal coping. Metallic paint is peeling in several locations.

## 3.2 Impedance Scanning

We performed impedance testing in general accordance with ASTM D7954-15a. Refer to Table 2.3 for general information related to field work. Refer to Table 3.1 for information specifically pertaining to impedance testing.

| TABLE 3.1 IMPEDANCE TESTING DETAILS                               |                                                              |
|-------------------------------------------------------------------|--------------------------------------------------------------|
| Date of Impedance Testing                                         | 2020/09/21                                                   |
| Time of Impedance Testing                                         | 1420h to 15450945h                                           |
| Ambient Temperature ,Relative Humidity, and Dew Point Temperature |                                                              |
| Pre-Testing                                                       | 70 °F, 63 %RH, 57 °F                                         |
| Mid-Testing                                                       | 71 °F, 61 %RH, 57 °F                                         |
| Post-Testing                                                      | 74 °F, 53 %RH, 56 °F                                         |
| Date and Amount of Last Precipitation Event                       | 0.29 inches on 2020/09/18                                    |
| Impedance Scanner Operator and Data Analyst                       | Cameron Chorney                                              |
| Scanner Make, Model and Serial Number                             | Tramex DEC DSAL rolling scanner (Serial Number: DS2 0720292) |

Testing was conducted using Technique A, Continuous Systematic Scanning and Recording, by rolling the DSAL scanner on the roof membrane in a systematic and continuous row-by-row manner when traversing the roof surface. This results in scanning 100% of the roof survey area.

Impedance testing indicated that one area of insulation below the roof membrane was measured to have elevated electrical conductivity in comparison to adjacent roof areas. Elevated conductivity is generally an indication of elevated moisture below the membrane. This area recorded is the known leak area at Roof J, and confirms CIDA's decision to completely replace this roof section.

Refer to Appendix B for a roof plan that shows color coded locations and relative sizes of areas with elevated EMC readings as determined during impedance testing.

## 4 Roof Openings

Impedance scanning indicated no moisture within the roof assembly beyond the known leak area at Roof J. As this section will be completely replaced, no test openings were deemed necessary to quantify the amount of moisture found.

## 5 Summary of Testing

Impedance testing confirm that one area of the roof, which is a known leak area, is measured to have elevated subsurface moisture. This testing verifies that the roof survey area has minimal subsurface moisture. Our testing, document review and visual observations confirm the roof is generally in fair condition. We recommend planning for re-roofing in approximately 1-2 years.

We understand that BSD and CIDA are planning re-roofing at Errol Hassell in 2021 and the scope of work consists of removing the ballast and providing new cover board and a new single-ply roof system over the existing roof system. The area with subsurface moisture needs to be addressed prior to or as part of this work to avoid trapping moisture within the assembly. If left unaddressed, the trapped moisture may void the warranty of the new roof system. We understand that CIDA plans to address the known leakage at Roof J by removing the existing roof system replacing with new, at this section only.

## 6 Closure

We appreciate the opportunity to work with CIDA and BSD. Please do not hesitate to contact the writer with any questions or to discuss next steps.

Yours truly,



**Cameron Chorney | BASc, CDT**  
Building Science Engineer (EIT)  
cchorney@rdh.com  
503-243-6222 x3152  
**RDH Building Science Inc.**

Reviewed by  
**Scott Mecalis | RA(WA), CSI, CDT**  
Senior Project Architect  
smecalis@rdh.com  
503-867-8519  
**RDH Building Science Inc.**

encl.

Appendix A – Photos of Roof Conditions

Appendix B – Roof Plan – Impedance Scanning and Cores

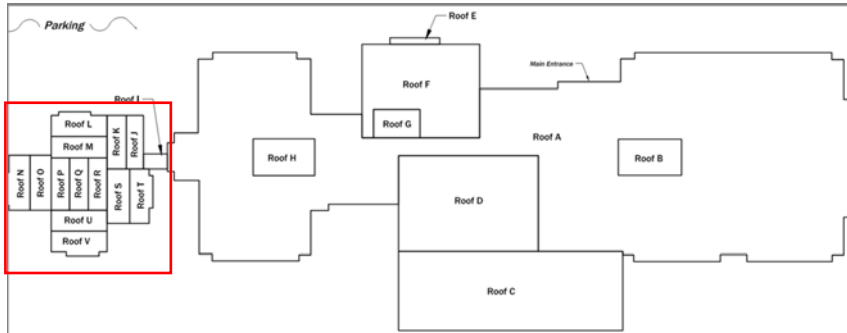




# Appendix A

## Photos of Roof Conditions

## Appendix A Photos of Roof Conditions



*Figure A.1*

*Overview of roof plan with area of moisture survey indicated in red.*



*Figure A.2*

*View of review area, as seen from Roof A looking east.*



*Figure A.3*

*Standing water at reported area of leak at Roof J. Repair patch is degrading, and subsurface moisture is detected.*



*Figure A.4*

*Moisture flow from rooftop unit (RTU) condensate line at Roof K.*





*Figure A.5*

*Minor organic growth along perimeter. Organic growth did not prevent testing.*



*Figure A.6*

*Typical parapet flashing intersection. Minor organic growth along perimeter.*



*Figure A.7*

*Deteriorated coating at typical drain pan. Scuppers measure 2" x 4". Organic debris may block water flow at scupper.*



*Figure A.8*

*High roof areas drain onto adjacent low roof via scupper, collector box, and down spout.*



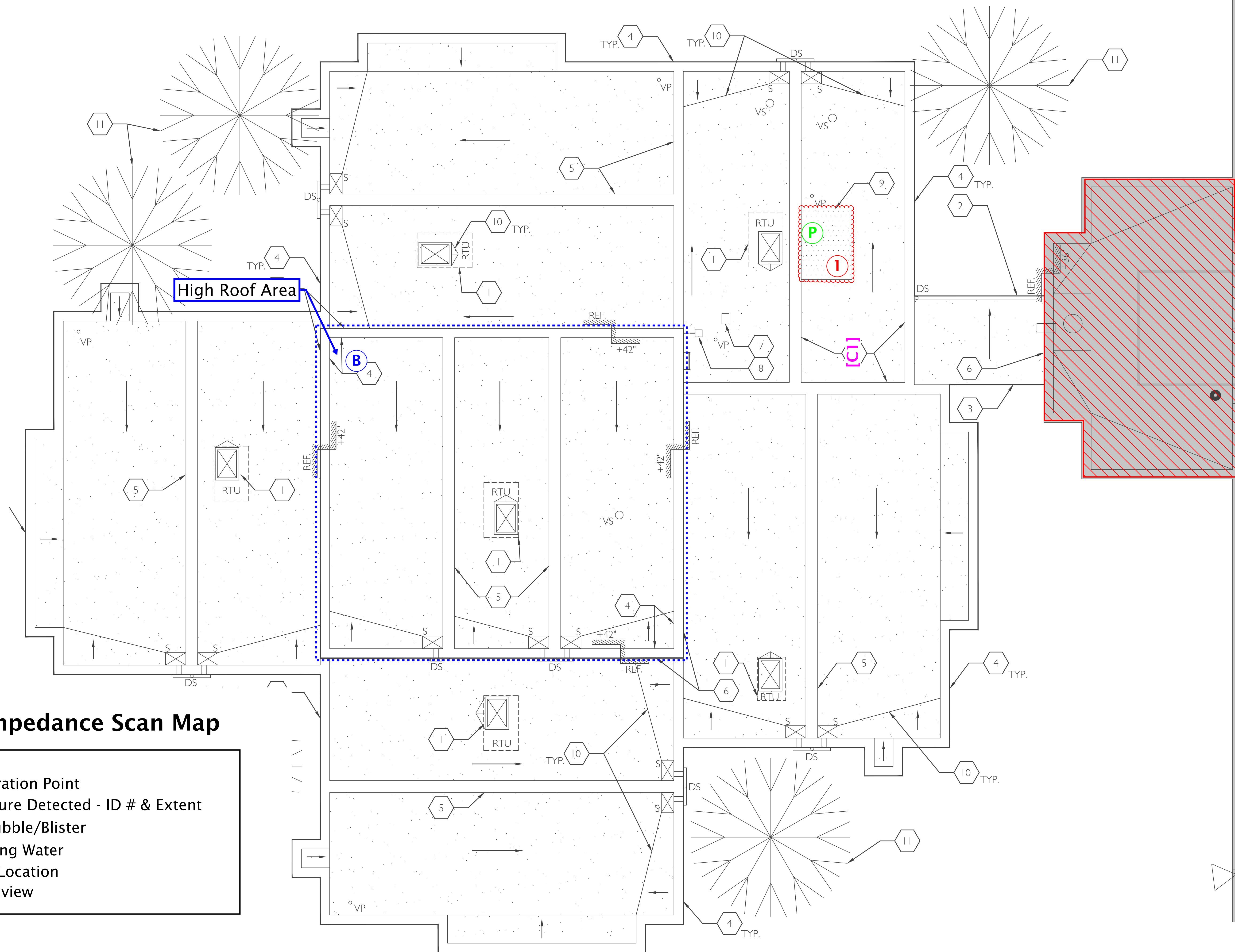


*Figure A.9*

*We observed one air bubble/delaminated membrane at Roof P.*

# Appendix B

## Roof Plan - Impedance Scanning and Cores



# Appendix B - Impedance Scan Map

**Legend**

C#

#

B

P

X

Calibration Point  
Moisture Detected - ID # & Extent  
Air Bubble/Blister  
Ponding Water  
Core Location  
No Review



# BSD 2021 Roofing Projects – Hiteon Elem. School

## TECHNICAL SPECIFICATIONS



PROJECT NUMBER: 20Y082.03

BID SET: OCTOBER 28, 2020



**AIA DOCUMENT A101-2017** *STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR*

- (INCORPORATED BY REFERENCE)

**AIA DOCUMENT A201-2017** *GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION*

- (INCORPORATED BY REFERENCE)

**BSD TECHNICAL STANDARDS** STANDARDS FOR DESIGN AND CONSTRUCTION OF ALL DISTRICT FACILITIES

- (INCORPORATED BY REFERENCE—PLEASE SEE WEBSITE)

<https://www.beaverton.k12.or.us/departments/facilities-development/technical-standards>

**DIVISION 0 PROCUREMENT AND CONTRACTING REQUIREMENTS**

|        |                   |
|--------|-------------------|
| 000110 | Table of Contents |
| 000115 | List of Drawings  |
| 000120 | Project Team      |

**DIVISION 1 GENERAL CONDITIONS**

|        |                                          |
|--------|------------------------------------------|
| 011000 | Summary                                  |
| 012200 | Unit Prices                              |
| 012500 | Substitution Procedures                  |
|        | Substitution Request Form: CSI Form 1.5C |
| 013100 | Project Management And Coordination      |
| 013123 | Project Management Database (E-Builder)  |
| 013200 | Construction Progress Documentation      |
| 013300 | Submittal Procedures                     |
| 013553 | Security Procedures                      |
| 014000 | Quality Requirements                     |
| 014200 | References                               |
| 015000 | Temporary Facilities And Controls        |
| 016100 | Common Product Requirements              |
| 017300 | Execution                                |
| 017329 | Cutting And Patching                     |
| 017700 | Closeout Procedures                      |
|        | Closeout Log Template                    |
| 017823 | Operation And Maintenance Data           |
| 017839 | Project Record Documents                 |
| 017900 | Demonstration And Training               |

**DIVISION 2 EXISTING CONDITIONS** (See APPENDIX 'A': ROOF INSPECTION REPORT')

|        |                                             |
|--------|---------------------------------------------|
| 022623 | Limited Supplemental Asbestos Survey Report |
|--------|---------------------------------------------|

**DIVISION 3 CONCRETE (NOT USED)**

Project Number: **20Y082.01**

**DIVISION 4 MASONRY (NOT USED)**

**DIVISION 5 METALS**

055000 Metal Fabrications

**DIVISION 6 WOOD, PLASTICS, AND COMPOSITES**

061000 Rough Carpentry

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**

075423 Thermoplastic Polyolefin (TPO) Membrane Roofing

**DIVISION 8 OPENINGS (NOT USED)**

**DIVISION 9 FINISHES (NOT USED)**

**APPENDIX A: ROOF INSPECTION REPORT**

- By A-Tech Northwest, Inc. dated 03/26/2020

END OF SECTION

## **LIST OF DRAWINGS**

CS1 COVER SHEET  
AD0.1 EXISTING CONDITIONS ROOF PLAN – WEST  
AD0.2 EXISTING CONDITIONS ROOF PLAN - EAST  
AD1.1 DEMO ROOF PLAN – WEST  
AD1.2 DEMO ROOF PLAN - EAST  
A1.1 ROOF PLAN – WEST  
A1.2 ROOF PLAN - EAST  
A2.1 FALL PROTECTION PLAN – WEST  
A2.2 FALL PROTECTION PLAN - EAST  
A3.1 DETAILS  
A3.2 DETAILS  
  
S1.1 STRUCTURAL ROOF PLAN  
S1.2 MECHANICAL ANCHORAGE DETAILS

Project Number: **20Y082.01**

## **PROJECT TEAM**

### OWNER

Beaverton School District

16550 SW Merlo Rd

Beaverton, OR 97003

Contact: Megan Finch, Project Manager

E-Mail: [megan\\_finch@beaverton.k12.or.us](mailto:megan_finch@beaverton.k12.or.us)

Phone: (503) 356-4318

Contact: Angela Knotts, Project Coordinator

E-Mail: [angela\\_knotts@beaverton.k12.or.us](mailto:angela_knotts@beaverton.k12.or.us)

Phone: (503) 356-4576

### ARCHITECT/ STRUCTURAL ENGINEER

CIDA

15895 SW 72<sup>ND</sup> Ave, Suite 200

Portland, OR 97224

Contact: Dustin Johnson

E-Mail: [dustinj@cidainc.com](mailto:dustinj@cidainc.com)

Phone: (503) 226-1285

Contact: Curtis Gagner

E-Mail: [curtisg@cidainc.com](mailto:curtisg@cidainc.com)

Phone: (503) 226-1285

### ROOFING CONSULTANT

RDH Building Science

5331 S Macadam Ave. #314

Portland, OR 97239

Contact: Kathleen Smith

E-mail: [ksmith@rdh.com](mailto:ksmith@rdh.com)

Phone: (503) 821-7321

Contact: Scott Mecalis

E-Mail: [smecalis@rdh.com](mailto:smecalis@rdh.com)

Phone: (503) 867-8519

### HAZARDOUS MATERIAL SURVEYOR

TRC Solutions

4105 SE International Way

Milwaukie, OR 97222

Contact: Ron Landolt

E-Mail: [rlandolt@trcsolutions.com](mailto:rlandolt@trcsolutions.com)

Phone: (503) 387-3251

### GENERAL CONTRACTOR

TBD

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

#### B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

### 1.2 PROJECT INFORMATION

#### A. Project Identification: BSD 2021 Roofing Projects: Hiteon Elementary School

1. Project Location: 13800 SW Brockman Rd, Beaverton, OR 97008

### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

#### A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. New roofing system/ roofing system tear off at gym, library, covered play area and classrooms. See architectural plans for areas that are not in scope.

#### B. Type of Contract.

1. Project will be constructed under a single prime contract.
  - a. *Standard Form of Agreement Between Owner and Contractor AIA Document A101, 2017 Edition Modified.*
  - b. *General Conditions of the Contract for Construction AIA Document A201, 2017 Edition Modified.*

### 1.4 ACCESS TO SITE

- #### A. General:
- Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

## 1.5 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
  - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
  - 3. Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

## 1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
  - 2. Comply with noise ordinances of the authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building and site as follows:
  - 1. Weekdays: 7:00 a.m. to 7:00 p.m (Custodian until 3:30 p.m.).
  - 2. Saturdays and Sundays: Arrange with Owner's Representative
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
  - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products, E-cigarettes/vape devices and other controlled substances on the Project site is not permitted.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Section:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

### 1.2 DEFINITIONS

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

### 1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. Schedule:
  - 1. A "Schedule of Unit Prices" is included at the end of this section.
  - 2. Include as part of each unit price, miscellaneous devices, appurtenances and similar items incidental to or required for a complete system whether or not mentioned as part of the unit price.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 Schedule of Unit Prices:

- A. New Sheet Metal Fabrications at Roof Edge Conditions
  - 1. New 24 ga. pre-finished sheet metal gutter and downspouts (Unit: Cost per lineal foot)
  - 2. New 24ga. pre-finished sheet metal coping cap (Unit: Cost per lineal foot)
- B. Roof Sheathing Replacement at Roof Overlay Areas
  - 1. Roof sheathing replacement at areas discovered during construction to be damaged or rotted. This item includes roof sheathing found to be rotted or damaged as a result of physical investigation. For the purpose of this unit price item, assume up to 5,000 square feet of sheathing to be replaced.
- C. Interior Roof Drain Replacement
  - 1. Replacement of entire roof drain assembly, including sump, drain bowl, clamp ring and strainer. Include associated cost of modifying the drain plumbing as needed. For the purpose of this unit price item, assume replacement of up to two full roof drain assemblies.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

### 1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

### 1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Architect to forward any substitution to BSD representative for approval prior to acceptance by the Architect.
  - 1. Substitution Request Form: Use CSI Substitution Request Form 1.5C provided at the end of this section.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Certificates and qualification data, where applicable or requested.
    - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
    - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided

within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 fifteen days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
  - a. Requested substitution has been approved by the Owner.
  - b. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - e. Requested substitution is compatible with other portions of the Work.
  - f. Requested substitution has been coordinated with other portions of the Work.
  - g. Requested substitution provides specified warranty.
  - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed.

## PART 3 - EXECUTION (Not Used)

END OF SECTION



# 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 ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ \_\_\_\_\_

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination drawings.
  - 2. Requests for Information (RFIs).
  - 3. Project Web site.
  - 4. Project meetings.

### 1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, Consultant or Contractor seeking information from each other during construction.

### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.

6. Preinstallation conferences.
7. Project Closeout Conference.
8. Startup and adjustment of systems.
9. Project closeout activities.

#### 1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
  1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
  1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing and electrical Work.
  2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Review: Architect/Consultant will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility.

#### 1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  1. Architect/Consultant will return RFIs submitted to Architect/Consultant by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

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- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to the District.
- D. Architect's Action: Architect/Consultant will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect/Consultant after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's/Consultant's action may include a request for additional information, in which case the allotted time for response will date from time of receipt of additional information.
  3. Architect's/Consultant's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect/Consultant and Owner's Representative in writing within seven days of receipt of the RFI response.
- E. On receipt of Architect's/Consultant's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect/Consultant and Owner's Representative within seven days if Contractor disagrees with response.



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- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site (e-Builder).

## 1.6 PROPOSAL REQUESTS

- A. Proposal Request Log: Contractor shall maintain a current log of all proposed requests and submit same at each project meeting and with each application for payment. Each proposal request shall have a unique number for tracking purpose. The log shall, at a minimum, show the proposal request number, date initiated, brief description, reference (i.e. RFI or supplemental instruction), estimated cost, estimated time, status, and reason for the proposal request (i.e. Unforeseen Condition/ Regulatory Requirement/ Owner Request/ E&O).

## 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner's Representative and Architect/Consultant of scheduled meeting dates and times.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner's Representative and Architect/Consultant, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
  - 1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Sustainable design requirements.

- l. Preparation of record documents.
    - m. Use of the premises and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.
    - q. Responsibility for temporary facilities and controls.
    - r. Procedures for moisture and mold control.
    - s. Procedures for disruptions and shutdowns.
    - t. Construction waste management and recycling.
    - u. Parking availability.
    - v. Office, work, and storage areas.
    - w. Equipment deliveries and priorities.
    - x. First aid.
    - y. Security.
    - z. Progress cleaning.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
  1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/ Consultant and Owner's Representative of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.

- w. Required performance results.
  - x. Protection of adjacent work.
  - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at intervals indicated in Owner/Contractor Agreement.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect/ Consultant, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Progress cleaning.
      - 10) Quality and work standards.
      - 11) Status of correction of deficient items.
      - 12) Field observations.
      - 13) Status of RFIs.
      - 14) Status of proposal requests.
      - 15) Pending changes.
      - 16) Status of Change Orders.

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- 17) Pending claims and disputes.
    - 18) Documentation of information for payment requests.
  - 3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Project Closeout Conference: Conduct conference prior to Substantial Completion.
  - 1. Attendees: Owner, Architect/ Consultant, Contractor.
  - 2. Agenda: Procedures for completing and archiving closeout deliverables in e-Builder;
    - a. Requirements for preparing Record Documents;
    - b. Requirements for preparing O&Ms;
    - c. Submittal of warranties;
    - d. Requirements for delivery of Maintenance stock;
    - e. Requirements for demonstration and training.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 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 and with website’s training documents uploaded to the project folder.
- 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’s Representative: Owner shall pay for and provide licenses/access for the following members of the project team.
  - 1. Lead member of Architect’s/Consultant’s design team responsible.
  - 2. Contractor’s project manager or lead member of Contractor’s project staff.
  - 3. Others as deemed appropriate by Owner’s Representative.

Project Number: **20Y082.01****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 ay 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](http://www.e-builder.net)).
  - d. Users are recommended to have a properly licensed version 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 user’s 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’S 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.

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- 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. All other communication shall be conducted in an industry standard manner.
  - 5. Submittals, contracts, meeting minutes, and other project records.
  - 6. Application for payments.
  - 7. Project closeout.
- 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 communications 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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.1 CONSTRUCTION PROGRESS DOCUMENTATION

- A. Progress Schedules and Reports: The Contractor, within ten calendar days after being awarded the Contract, shall prepare and submit for the information of the Owner's Representative and the Architect/Consultant a Progress Schedule in critical path management ("CPM") format satisfactory to the Owner's 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 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 the 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.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

### 1.2 QUALITY CONTROL

- A. Submit 3-week work schedule, shop drawings, product data, samples, schedule of values and record documents as follows:
  - 1. Submit to Architect/Consultant and Owner's Representative only through General Contractor.
  - 2. The General Contractor shall provide a set of submittals to the Owner's Representative for review and approval concurrent with review by the Architect and Consultant(s).

### 1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's/ Consultant's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
  - 1. Architect/Consultant will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital data files are provided for Contractor's convenience and to help expedite the submittal preparation process. Use of the digital data files is at Contractor's risk and does not release the Contractor from verifying and indicating as-built conditions which may or may not be indicated in the digital data files.
    - c. Contractor shall execute a release of Architect's/Consultant's liability for Contractor's use of the digital data files. Release form shall be provide by Architect/Consultant.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect and Consultant reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect/Consultant's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Consultant or Owner's Representative will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect/Consultant.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01).

Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/ Consultant.
  4. Include the following information on an inserted cover sheet:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Name of subcontractor.
    - h. Name of supplier.
    - i. Name of manufacturer.
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Related physical samples submitted directly.
    - n. Other necessary identification.
- F. Options: Identify options requiring selection by the Architect.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's/ Consultant's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals that are marked with approval notation from Architect's or Consultant's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

#### A. General Submittal Procedure Requirements:

1. Post electronic submittals as PDF electronic files directly to e-Builder.
  - a. Architect/Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures." All closeout submittals to be uploaded to e-Builder in format acceptable to the District.
  3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
  4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data without field-verifying as-built conditions which may or may not be indicated at part of the released digital data files.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
  3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/ Consultant will return submittal with options selected.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or

containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect/Consultant will retain two Sample sets; remainder will be returned.

- 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Submit product schedule in the following format:

- a. PDF electronic file.

- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

- G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

- H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

1. Submit subcontract list in the following format:

- a. PDF electronic file.

- J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

- K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

- M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

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- N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Consultant and Owner's Representative.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S/ CONSULTANT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect/ Consultant will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect or Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION



## 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.
- 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 Owner's Representative's discretion, the superintendent may be issued a building key to allow access to areas 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 authority.
- K. Contractor shall 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 need to get an ID badge and a hard hat sticker (not provided by BSD), 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

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the proper ID badge and a hat sticker. The following are the convicted crimes that may appear on the background check:

- Aggravated Murder of 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
- 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 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
- Sadoomasochistic 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 (Including firearms located in a locked 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.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Consultant, Owner's Representative, or authorities having jurisdiction are not limited by provisions of this Section.

### 1.2 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

### 1.3 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### 1.4 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect/Consultant and Owner's Representative with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

## 1.5 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. **Testing Agency Responsibilities:** Cooperate with Architect, Consultant, Owner's Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect/Consultant, Owner's Representative and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- F. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

#### 1.6 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner's Representative will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:
  1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect/Consultant and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect/Consultant and Owner's Representative with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected work.

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION

##### 3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION



## PART 1 - GENERAL

### 1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

### 1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### 1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl1

|        |                                                                    |
|--------|--------------------------------------------------------------------|
| AA     | Aluminum Association, Inc. (The)                                   |
| AAADM  | American Association of Automatic Door Manufacturers               |
| AABC   | Associated Air Balance Council                                     |
| AAMA   | American Architectural Manufacturers Association                   |
| AASHTO | American Association of State Highway and Transportation Officials |
| AATCC  | American Association of Textile Chemists and Colorists             |
| ABAA   | Air Barrier Association of America                                 |
| ABMA   | American Bearing Manufacturers Association                         |
| ACI    | American Concrete Institute                                        |
| ACPA   | American Concrete Pipe Association                                 |
| AEIC   | Association of Edison Illuminating Companies, Inc. (The)           |
| AF&PA  | American Forest & Paper Association                                |
| AGA    | American Gas Association                                           |
| AGC    | Associated General Contractors of America (The)                    |
| AHA    | American Hardboard Association<br>(Now part of CPA)                |
| AHAM   | Association of Home Appliance Manufacturers                        |
| AI     | Asphalt Institute                                                  |
| AIA    | American Institute of Architects (The)                             |

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|          |                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------|
| AISC     | American Institute of Steel Construction                                                                      |
| AISI     | American Iron and Steel Institute                                                                             |
| AITC     | American Institute of Timber Construction                                                                     |
| ALCA     | Associated Landscape Contractors of America<br>(Now PLANET - Professional Landcare Network)                   |
| ALSC     | American Lumber Standard Committee, Incorporated                                                              |
| AMCA     | Air Movement and Control Association International, Inc.                                                      |
| ANSI     | American National Standards Institute                                                                         |
| AOSA     | Association of Official Seed Analysts, Inc.                                                                   |
| APA      | Architectural Precast Association                                                                             |
| APA      | APA - The Engineered Wood Association                                                                         |
| APA EWS  | APA - The Engineered Wood Association; Engineered Wood Systems<br>(See APA - The Engineered Wood Association) |
| API      | American Petroleum Institute                                                                                  |
| ARI      | Air-Conditioning & Refrigeration Institute                                                                    |
| ARMA     | Asphalt Roofing Manufacturers Association                                                                     |
| ASCE     | American Society of Civil Engineers                                                                           |
| ASCE/SEI | American Society of Civil Engineers/Structural Engineering Institute<br>(See ASCE)                            |
| ASHRAE   | American Society of Heating, Refrigerating and Air-Conditioning Engineers                                     |
| ASME     | ASME International<br>(American Society of Mechanical Engineers International)                                |
| ASSE     | American Society of Sanitary Engineering                                                                      |
| ASTM     | ASTM International<br>(American Society for Testing and Materials International)                              |
| AWCI     | Association of the Wall and Ceiling Industry                                                                  |
| AWCMA    | American Window Covering Manufacturers Association<br>(Now WCMA)                                              |
| AWI      | Architectural Woodwork Institute                                                                              |

|       |                                                                                                        |
|-------|--------------------------------------------------------------------------------------------------------|
| AWPA  | American Wood Protection Association<br>(Formerly: American Wood Preservers' Association)              |
| AWS   | American Welding Society                                                                               |
| AWWA  | American Water Works Association                                                                       |
| BHMA  | Builders Hardware Manufacturers Association                                                            |
| BIA   | Brick Industry Association (The)                                                                       |
| BICSI | BICSI, Inc.                                                                                            |
| BIFMA | BIFMA International<br>(Business and Institutional Furniture Manufacturer's Association International) |
| BISSC | Baking Industry Sanitation Standards Committee                                                         |
| BSD   | Beaverton School District                                                                              |
| BWF   | Badminton World Federation<br>(Formerly: IBF - International Badminton Federation)                     |
| CCC   | Carpet Cushion Council                                                                                 |
| CDA   | Copper Development Association                                                                         |
| CEA   | Canadian Electricity Association                                                                       |
| CEA   | Consumer Electronics Association                                                                       |
| CFFA  | Chemical Fabrics & Film Association, Inc.                                                              |
| CGA   | Compressed Gas Association                                                                             |
| CIMA  | Cellulose Insulation Manufacturers Association                                                         |
| CISCA | Ceilings & Interior Systems Construction Association                                                   |
| CISPI | Cast Iron Soil Pipe Institute                                                                          |
| CLFMI | Chain Link Fence Manufacturers Institute                                                               |
| CRRC  | Cool Roof Rating Council                                                                               |
| CPA   | Composite Panel Association                                                                            |
| CPPA  | Corrugated Polyethylene Pipe Association                                                               |
| CRI   | Carpet and Rug Institute (The)                                                                         |

|              |                                                                                      |
|--------------|--------------------------------------------------------------------------------------|
| CRSI         | Concrete Reinforcing Steel Institute                                                 |
| CSA          | Canadian Standards Association                                                       |
| CSA          | CSA International<br>(Formerly: IAS - International Approval Services)               |
| CSI          | Cast Stone Institute                                                                 |
| CSI          | Construction Specifications Institute (The)                                          |
| CSSB         | Cedar Shake & Shingle Bureau                                                         |
| CTI          | Cooling Technology Institute<br>(Formerly: Cooling Tower Institute)                  |
| DHI          | Door and Hardware Institute                                                          |
| EIA          | Electronic Industries Alliance                                                       |
| EIMA         | EIFS Industry Members Association                                                    |
| EJCDC        | Engineers Joint Contract Documents Committee                                         |
| EJMA         | Expansion Joint Manufacturers Association, Inc.                                      |
| ESD          | ESD Association<br>(Electrostatic Discharge Association)                             |
| ETL SEMCO    | Intertek ETL SEMCO<br>(Formerly: ITS - Intertek Testing Service NA)                  |
| FIBA         | Federation Internationale de Basketball<br>(The International Basketball Federation) |
| FIVB         | Federation Internationale de Volleyball<br>(The International Volleyball Federation) |
| FM Approvals | FM Approvals LLC                                                                     |
| FM Global    | FM Global<br>(Formerly: FMG - FM Global)                                             |
| FMRC         | Factory Mutual Research<br>(Now FM Global)                                           |
| FRSA         | Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.        |
| FSA          | Fluid Sealing Association                                                            |

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|       |                                                                       |
|-------|-----------------------------------------------------------------------|
| FSC   | Forest Stewardship Council                                            |
| GA    | Gypsum Association                                                    |
| GANA  | Glass Association of North America                                    |
| GRI   | (Part of GSI)                                                         |
| GS    | Green Seal                                                            |
| GSI   | Geosynthetic Institute                                                |
| HI    | Hydraulic Institute                                                   |
| HI    | Hydronics Institute                                                   |
| HMMA  | Hollow Metal Manufacturers Association<br>(Part of NAAMM)             |
| HPVA  | Hardwood Plywood & Veneer Association                                 |
| HPW   | H. P. White Laboratory, Inc.                                          |
| IAS   | International Approval Services<br>(Now CSA International)            |
| IBF   | International Badminton Federation<br>(Now BWF)                       |
| ICEA  | Insulated Cable Engineers Association, Inc.                           |
| ICRI  | International Concrete Repair Institute, Inc.                         |
| IEC   | International Electrotechnical Commission                             |
| IEEE  | Institute of Electrical and Electronics Engineers, Inc. (The)         |
| IESNA | Illuminating Engineering Society of North America                     |
| IEST  | Institute of Environmental Sciences and Technology                    |
| IGCC  | Insulating Glass Certification Council                                |
| IGMA  | Insulating Glass Manufacturers Alliance                               |
| ILI   | Indiana Limestone Institute of America, Inc.                          |
| ISO   | International Organization for Standardization<br>Available from ANSI |
| ISSFA | International Solid Surface Fabricators Association                   |

|       |                                                                                   |
|-------|-----------------------------------------------------------------------------------|
| ITS   | Intertek Testing Service NA<br>(Now ETL SEMCO)                                    |
| ITU   | International Telecommunication Union                                             |
| KCMA  | Kitchen Cabinet Manufacturers Association                                         |
| LMA   | Laminating Materials Association<br>(Now part of CPA)                             |
| LPI   | Lightning Protection Institute                                                    |
| MBMA  | Metal Building Manufacturers Association                                          |
| MFMA  | Maple Flooring Manufacturers Association, Inc.                                    |
| MFMA  | Metal Framing Manufacturers Association, Inc.                                     |
| MH    | Material Handling<br>(Now MHIA)                                                   |
| MHIA  | Material Handling Industry of America                                             |
| MIA   | Marble Institute of America                                                       |
| MPI   | Master Painters Institute                                                         |
| MSS   | Manufacturers Standardization Society of The Valve and Fittings Industry Inc.     |
| NAAMM | National Association of Architectural Metal Manufacturers                         |
| NACE  | NACE International<br>(National Association of Corrosion Engineers International) |
| NADCA | National Air Duct Cleaners Association                                            |
| NAGWS | National Association for Girls and Women in Sport                                 |
| NAIMA | North American Insulation Manufacturers Association                               |
| NBGQA | National Building Granite Quarries Association, Inc.                              |
| NCAA  | National Collegiate Athletic Association (The)                                    |
| NCMA  | National Concrete Masonry Association                                             |
| NCPI  | National Clay Pipe Institute                                                      |
| NCTA  | National Cable & Telecommunications Association                                   |

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|       |                                                                                                                   |
|-------|-------------------------------------------------------------------------------------------------------------------|
| NEBB  | National Environmental Balancing Bureau                                                                           |
| NECA  | National Electrical Contractors Association                                                                       |
| NeLMA | Northeastern Lumber Manufacturers' Association                                                                    |
| NEMA  | National Electrical Manufacturers Association                                                                     |
| NETA  | InterNational Electrical Testing Association                                                                      |
| NFHS  | National Federation of State High School Associations                                                             |
| NFPA  | NFPA<br>(National Fire Protection Association)                                                                    |
| NFRC  | National Fenestration Rating Council                                                                              |
| NGA   | National Glass Association                                                                                        |
| NHLA  | National Hardwood Lumber Association                                                                              |
| NLGA  | National Lumber Grades Authority                                                                                  |
| NOFMA | NOFMA: The Wood Flooring Manufacturers Association<br>(Formerly: National Oak Flooring Manufacturers Association) |
| NOMMA | National Ornamental & Miscellaneous Metals Association                                                            |
| NRCA  | National Roofing Contractors Association                                                                          |
| NRMCA | National Ready Mixed Concrete Association                                                                         |
| NSF   | NSF International<br>(National Sanitation Foundation International)                                               |
| NSSGA | National Stone, Sand & Gravel Association                                                                         |
| NTMA  | National Terrazzo & Mosaic Association, Inc. (The)                                                                |
| NTRMA | National Tile Roofing Manufacturers Association<br>(Now TRI)                                                      |
| NWWDA | National Wood Window and Door Association<br>(Now WDMA)                                                           |
| OPL   | Omega Point Laboratories, Inc.<br>(Now ITS)                                                                       |
| PCI   | Precast/Prestressed Concrete Institute                                                                            |
| PDCA  | Painting & Decorating Contractors of America                                                                      |



|          |                                                                                                                                            |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------|
| PDI      | Plumbing & Drainage Institute                                                                                                              |
| PGI      | PVC Geomembrane Institute                                                                                                                  |
| PLANET   | Professional Landcare Network<br>(Formerly: ACLA - Associated Landscape Contractors of America)                                            |
| PTI      | Post-Tensioning Institute                                                                                                                  |
| RCSC     | Research Council on Structural Connections                                                                                                 |
| RFCI     | Resilient Floor Covering Institute                                                                                                         |
| RIS      | Redwood Inspection Service                                                                                                                 |
| SAE      | SAE International                                                                                                                          |
| SDI      | Steel Deck Institute                                                                                                                       |
| SDI      | Steel Door Institute                                                                                                                       |
| SEFA     | Scientific Equipment and Furniture Association                                                                                             |
| SEI/ASCE | Structural Engineering Institute/American Society of Civil Engineers<br>(See ASCE)                                                         |
| SGCC     | Safety Glazing Certification Council                                                                                                       |
| SIA      | Security Industry Association                                                                                                              |
| SIGMA    | Sealed Insulating Glass Manufacturers Association<br>(Now IGMA)                                                                            |
| SJI      | Steel Joist Institute                                                                                                                      |
| SMA      | Screen Manufacturers Association                                                                                                           |
| SMACNA   | Sheet Metal and Air Conditioning Contractors'<br>National Association                                                                      |
| SMPTE    | Society of Motion Picture and Television Engineers                                                                                         |
| SPFA     | Spray Polyurethane Foam Alliance<br>(Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray<br>Polyurethane Foam Division) |
| SPIB     | Southern Pine Inspection Bureau (The)                                                                                                      |
| SPRI     | Single Ply Roofing Industry                                                                                                                |

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|         |                                                                                                          |
|---------|----------------------------------------------------------------------------------------------------------|
| SSINA   | Specialty Steel Industry of North America                                                                |
| SSPC    | SSPC: The Society for Protective Coatings                                                                |
| STI     | Steel Tank Institute                                                                                     |
| SWI     | Steel Window Institute                                                                                   |
| SWRI    | Sealant, Waterproofing, & Restoration Institute                                                          |
| TCA     | Tile Council of America, Inc.<br>(Now TCNA)                                                              |
| TCNA    | Tile Council of North America, Inc.                                                                      |
| TIA/EIA | Telecommunications Industry Association/Electronic Industries Alliance                                   |
| TMS     | The Masonry Society                                                                                      |
| TPI     | Truss Plate Institute, Inc.                                                                              |
| TPI     | Turfgrass Producers International                                                                        |
| TRI     | Tile Roofing Institute                                                                                   |
| UL      | Underwriters Laboratories Inc.                                                                           |
| UNI     | Uni-Bell PVC Pipe Association                                                                            |
| USAV    | USA Volleyball                                                                                           |
| USGBC   | U.S. Green Building Council                                                                              |
| USITT   | United States Institute for Theatre Technology, Inc.                                                     |
| WASTEC  | Waste Equipment Technology Association                                                                   |
| WCLIB   | West Coast Lumber Inspection Bureau                                                                      |
| WCMA    | Window Covering Manufacturers Association                                                                |
| WCSC    | Window Covering Safety Council<br>(Formerly: WCMA - Window Covering Manufacturers Association)           |
| WDMA    | Window & Door Manufacturers Association<br>(Formerly: NWWDA - National Wood Window and Door Association) |
| WI      | Woodwork Institute (Formerly: WIC - Woodwork Institute of California)                                    |
| WIC     | Woodwork Institute of California<br>(Now WI)                                                             |

WMMPA        Wood Moulding & Millwork Producers Association

WSRCA        Western States Roofing Contractors Association

WWPA        Western Wood Products Association

C.    Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl2

IAPMO       International Association of Plumbing and Mechanical Officials

ICC        International Code Council

ICC-ES      ICC Evaluation Service, Inc.

UBC        Uniform Building Code  
(See ICC)

D.    Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl3

CE        Army Corps of Engineers

CPSC       Consumer Product Safety Commission

DOC        Department of Commerce

DOD        Department of Defense

DOE        Department of Energy

EPA        Environmental Protection Agency

FAA        Federal Aviation Administration

FCC        Federal Communications Commission

FDA        Food and Drug Administration

GSA        General Services Administration

HUD        Department of Housing and Urban Development

LBL        Lawrence Berkeley National Laboratory

NCHRP      National Cooperative Highway Research Program  
(See TRB)

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|      |                                                |
|------|------------------------------------------------|
| NIST | National Institute of Standards and Technology |
| OSHA | Occupational Safety & Health Administration    |
| PBS  | Public Buildings Service<br>(See GSA)          |
| PHS  | Office of Public Health and Science            |
| RUS  | Rural Utilities Service<br>(See USDA)          |
| SD   | State Department                               |
| TRB  | Transportation Research Board                  |
| USDA | Department of Agriculture                      |
| USPS | Postal Service                                 |

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl4

|         |                                                                                                                                                                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ADAAG   | Americans with Disabilities Act (ADA)<br>Architectural Barriers Act (ABA)<br>Accessibility Guidelines for Buildings and Facilities<br>Available from U.S. Access Board                                                                                     |
| CFR     | Code of Federal Regulations<br>Available from Government Printing Office                                                                                                                                                                                   |
| DOD     | Department of Defense Military Specifications and Standards<br>Available from Department of Defense Single Stock Point                                                                                                                                     |
| DSCC    | Defense Supply Center Columbus<br>(See FS)                                                                                                                                                                                                                 |
| FED-STD | Federal Standard<br>(See FS)                                                                                                                                                                                                                               |
| FS      | Federal Specification<br>Available from Department of Defense Single Stock Point<br><br>Available from Defense Standardization Program<br><br>Available from General Services Administration<br><br>Available from National Institute of Building Sciences |

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FTMS      Federal Test Method Standard  
              (See FS)

MIL        (See MILSPEC)

MIL-STD   (See MILSPEC)

MILSPEC   Military Specification and Standards  
              Available from Department of Defense Single Stock Point

UFAS      Uniform Federal Accessibility Standards  
              Available from Access Board

F.      State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl5

CBHF      State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR      California Code of Regulations

CPUC      California Public Utilities Commission

TFS      Texas Forest Service  
              Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

### 1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect/Consultant, Owner's Representative, testing agencies, and authorities having jurisdiction. Temporary facilities required for the project include but may not be limited to:
  - 1. Sanitary Facilities
  - 2. Telephone/Fax
  - 3. Internet
- B. Water from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

### 1.4 QUALITY ASSURANCE

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

### 1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures."

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  - 1. Provide portable facilities as required for workmen. Keep facilities clean and in sanitary condition. Remove from the site upon completion of the Work.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
  - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. At a conspicuous place within the primary field office post a list of important telephone numbers, including:
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Architect's office.
    - e. Engineers' offices.
    - f. Owner's Representative's office.
    - g. Principal subcontractors' field and home offices.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- B. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- C. Temporary Enclosures: Contractor to provide Weather Mitigation Plan in the event of rain and to establish procedures for temporary protection as well as an emergency contact list, please see roofing specification 075423 for additional information. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.



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- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Prohibit smoking in construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  - 3. Develop and supervise an overall fire-prevention -and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### 3.4 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  - 1. 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 to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION

## 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/Consultant and Owner's Representative.
- 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 by the Architect/Consultant or Owner's Representative.
- 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 submittal to the Architect through the Owner's Project Management Database (e-Builder).\
- 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.

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1. Consult with Architect/Consultant 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Coordination of Owner-installed products.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
  - 8. Correction of the Work.
- B. Related Sections:
  - 1. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 2. Division 01 Section "Cutting and Patching".

### 1.2 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect and Owner's Representative for the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner's Representative that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect/ Consultant according to requirements in Division 01 Section "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and as-built conditions. If discrepancies are discovered, notify Architect/ Consultant promptly.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Allow for building movement, including thermal expansion and contraction.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.6 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

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- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

### 3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

### 1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio. Notify A/E immediately and without further modification to structural elements if such compromise to structure inadvertently occurs.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Notify A/E immediately if such compromise to operational elements inadvertently occurs.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials. Submit 3 samples for Architect and Owner approval.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

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1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.

### 1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner's Representative of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 8. Complete startup testing of systems.
  - 9. Submit test/adjust/balance records.
  - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 11. Advise Owner of changeover in heat and other utilities.
  - 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  - 13. Complete final cleaning requirements, including touchup painting.
  - 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
  - 15. Prepare Closeout Log: An electronic spreadsheet log listing all closeout deliverables required in the specifications including contractor's record drawings, warranties, shop drawings, product data, extra stock, training and O&Ms. See Sample Closeout Log provided in at the end of this section.

- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  - 2. Results of completed inspection will form the basis of requirements for final completion.

### 1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
  - 1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
  - 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 4. Submit pest-control final inspection report and warranty.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### 1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize list of spaces in a sequential order.
  - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  - 3. Submit list of incomplete items in the following format:
    - a. PDF electronic file.

## 1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Scan warranties and bonds and assemble complete warranty and bond submittal package into individual PDF files organized by specification section.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
- m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
- o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- r. Leave Project clean and ready for occupancy.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. See Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
- C. See Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

### 1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Submit one set of marked-up Record Prints, and the following:
      - 1) Record CAD Drawing Files and Plots: One set.
      - 2) Copies printed from Record CAD Drawing Plots: One. Plot and print each Drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one copy copies of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
  - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.



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- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
  2. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Architect for resolution.
  4. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into single PDF file.
  2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
  4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

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1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

# PART 3 - EXECUTION

## 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION

PART 1 - GENERAL

1.1 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to Final Completion or acceptance, fully instruct the Owner's Designated Representative and maintenance personnel in the operation, adjustment, and maintenance of all products, equipment, and systems.
  - 1. The District reserves the right to videotape training sessions.
- B. Operating and maintenance manual shall constitute the basis of instruction.
  - 1. Review contents of manual with Owner's personnel in full detail to explain all aspects of operations and maintenance.
  - 2. Review complete heating and cooling cycles with Owner's Designated Representative. Review location of dampers, valves, and control equipment.

END OF SECTION

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022623      LIMITED SUPPLEMENTAL ASBESTOS SURVEY REPORT  
(see next page)

# **LIMITED SUPPLEMENTAL ASBESTOS SURVEY REPORT**

## **Hiteon Elementary School**

**13800 SW Brockman Road  
Beaverton, OR 97008**

Prepared for:

## **Beaverton School District**

**16550 SW Merlo Road  
Beaverton, OR 97006**

**Inspection Dates:** June 29, 2020

**Report Prepared:** July 20, 2020

Prepared By:



**4105 SE International Way, Suite 505  
Milwaukie, OR 97222  
503.387.3251**

TRC Project Number: 401824

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- Appendix A – Figures
- Appendix B – Laboratory Analytical Data Sheets
- Appendix C – Prior Documentation
- Appendix D – Inspector Certification(s)

## **EXECUTIVE SUMMARY**

TRC Environmental Corporation (TRC) was contracted by the Beaverton School District to conduct a supplemental asbestos survey, including collection of bulk asbestos samples, laboratory analysis, and preparation of a report for Hiteon Elementary School located at 13800 SW Brockman Road in Beaverton, Oregon 97008. Mr. Matt Cuda and Mr. Jason Stone, AHERA accredited building inspectors performed the survey on June 29<sup>th</sup>, 2020. 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.

The following materials sampled during this investigation and prior investigations were identified as asbestos containing materials:

- Floor Tile and Mastic (Previously Sampled)
- 12" x 12" Beige and Yellow/ Tan Floor Tile and Mastic (Previously Sampled)
- Chalkboard Mastic, Tan (Previously Sampled)
- Window Glazing (Previously Sampled)
- Transite Panels (Previously Sampled)
- Joint Compound (A-Wing, B-Wing and C-Wing)
- Fire Doors (Assumed)

The following materials sampled during this investigation and prior investigations were identified as OSHA Regulated Materials (OSHA):

- Gypsum Board and Joint Compound (Composite - Throughout)

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 supplemental asbestos survey was conducted by TRC at Hiteon Elementary School, located at 13800 SW Brockman Road in Beaverton, Oregon. It was reported by the client that this limited hazardous materials survey is being conducted in conjunction with their HVAC renovation project. The survey activities were performed on June 29<sup>th</sup>, 2020, 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. Laboratory analytical results are presented in Appendix B and Prior Documentation is presented in Appendix C.

Mr. Matt Cuda and Mr. Jason Stone, AHERA accredited building inspector's 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 EMC Labs, Inc., in Phoenix, Arizona, 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, July 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 |
|-------------------------------------------------------------------------------------------------|---------------------|--------------------------------------------------|------------------|----------------------|
| HES-01A<br>HES-01B<br>HES-01C<br>HES-01D<br>HES-01E<br>HES-01F<br>HES-01G<br>HES-01H<br>HES-01I | Built-up Roofing    | Throughout                                       | ND               | N/A                  |
| HES-02A<br>HES-02B<br>HES-02C                                                                   | Gray Roof Caulking  | Throughout<br>Roof Vents                         | ND               | N/A                  |
| HES-03A<br>HES-03B<br>HES-03C                                                                   | Roofing Felt Paper  | Cafeteria Roof                                   | ND               | N/A                  |
| HES-04A<br>HES-04B<br>HES-04C                                                                   | Black Roof Caulking | Edge Between<br>Flashing and TPO<br>Roof         | ND               | N/A                  |
| HES-05A<br>HES-05B<br>HES-05C                                                                   | Gray Roofing Mastic | Roof Edge between<br>TPO and Built-up<br>Roofing | ND               | N/A                  |
| HES-06A<br>HES-06B<br>HES-06C                                                                   | HVAC Duct Tape      | A Wing Mechanical<br>Mezzanine                   | ND               | N/A                  |

ND = Non-detect

SF = Square feet

LF = Linear Feet

N/A = Not Applicable

| Sample No.                             | Material                                                     | Sample Location             | Asbestos Content                                                             | Approximate Quantity |
|----------------------------------------|--------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------|----------------------|
| HES-07A<br>HES-07B<br>HES-07C          | Gray HVAC Caulking                                           | A Wing Mechanical Mezzanine | ND                                                                           | N/A                  |
| HES-08A<br>HES-08B<br>HES-08C          | Gypsum Board and Joint Compound                              | Throughout A Wing           | G.B. – ND<br>J.C. – ND                                                       | N/A                  |
| <b>HES-09A<br/>HES-09B<br/>HES-09C</b> | <b>Gypsum Board and Joint Compound</b>                       | <b>Throughout C Wing</b>    | <b>G.B. – ND<br/>J.C. – 3%<br/>Chrysotile<br/>Comp – 0.5%<br/>Chrysotile</b> | <b>8,500 SF</b>      |
| HES-10A<br>HES-10B<br>HES-10C          | Hard Fitting                                                 | C Wing Mechanical Mezzanine | ND                                                                           | N/A                  |
| HES-11A<br>HES-11B<br>HES-11C          | 2' x 4' Drop-in Ceiling Tile with Fissures and Pinholes      | Throughout C Wing           | ND                                                                           | N/A                  |
| HES-12A<br>HES-12B<br>HES-12C          | Gray HVAC Duct Mastic                                        | HVAC Ducts Throughout       | ND                                                                           | N/A                  |
| HES-13A<br>HES-13B<br>HES-13C          | Black Mastic                                                 | Above Ceiling               | ND                                                                           | N/A                  |
| HES-14A<br>HES-14B<br>HES-14C          | 2' x 4' Drop-in Ceiling Tile, Pinholes                       | Throughout B Wing           | ND                                                                           | N/A                  |
| HES-15A<br>HES-15B<br>HES-15C          | Gypsum Board and Joint Compound                              | Throughout B Wing           | G.B. – ND<br>J.C. – ND                                                       | N/A                  |
| HES-16A<br>HES-16B<br>HES-16C          | 2' x 4' Drop-in Ceiling Tile with Long Fissures and Pinholes | Throughout A Wing           | ND                                                                           | N/A                  |
| HES-17A<br>HES-17B<br>HES-17C          | 1' x 1' Ceiling Tile and Glue                                | Gym, Stage                  | Tile – ND<br>Glue – ND                                                       | N/A                  |

ND = Non-detect

SF = Square feet

LF = Linear Feet

N/A = Not Applicable

### Asbestos Containing Materials (ACMs)

Asbestos was detected in the following materials sampled during this and prior investigations:

| Material                                             | Approximate Location(s)                | Approximate Quantity                   |
|------------------------------------------------------|----------------------------------------|----------------------------------------|
| Floor Tile and Mastic                                | A112<br>(now part of library and hall) | Unknown<br><b>(Previously Sampled)</b> |
| 12" x 12" Beige and Yellow/Tan Floor Tile and Mastic | B Hall                                 | Unknown<br><b>(Previously Sampled)</b> |
| Chalkboard Mastic, Tan                               | C106<br>(Behind new whiteboard)        | Unknown<br><b>(Previously Sampled)</b> |

| Material        | Approximate Location(s)   | Approximate Quantity            |
|-----------------|---------------------------|---------------------------------|
| Joint Compound  | A-Wing, B-Wing and C-Wing | Unknown<br>(Previously Sampled) |
| Transite Panels | Custodial Office          | 40 SF                           |
| Window Glazing  | Throughout                | Unknown<br>(Previously Sampled) |
| Fire Doors      | Throughout                | Assumed                         |

OSHA Regulated Materials (<1.0%)

| Material                                    | Approximate Location(s)              | Approximate Quantity |
|---------------------------------------------|--------------------------------------|----------------------|
| Gypsum Board and Joint Compound (Composite) | Throughout A-Wing, B-Wing and C-Wing | <b>60,000 SF</b>     |

Prior sampling data indicated a mix results from the A-Wing and B-Wing and current sample results indicated no asbestos detected in the samples from the A-Wing and B-Wing, therefore all the walls in these three areas are assumed to be OSHA regulated.

Non-Detect Materials (ND)

Asbestos was not detected in the following materials sampled during this investigation:

| Material                                                     | Location                                                                            |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Built-up Roofing                                             | Throughout                                                                          |
| Gray Roof Caulking                                           | Throughout Roof Vents                                                               |
| Roofing Felt Paper                                           | Cafeteria Roof                                                                      |
| Black Roof Caulking                                          | Edge Between Flashing and TPO Roof                                                  |
| Gray Roofing Mastic                                          | Roof Edge between TPO and Built-up Roofing                                          |
| HVAC Duct Tape                                               | A Wing Mechanical Mezzanine                                                         |
| Gray HVAC Caulking                                           | A Wing Mechanical Mezzanine                                                         |
| Gypsum Board and Joint Compound                              | Throughout A Wing                                                                   |
| Hard Fitting                                                 | C Wing Mechanical Mezzanine                                                         |
| 2' x 4' Drop-in Ceiling Tile with Fissures and Pinholes      | Throughout C Wing                                                                   |
| Gray HVAC Duct Mastic                                        | HVAC Ducts Throughout                                                               |
| Black Mastic                                                 | Above Ceiling                                                                       |
| 2' x 4' Drop-in Ceiling Tile, Pinholes                       | Throughout B Wing                                                                   |
| Gypsum Board and Joint Compound                              | Throughout B Wing                                                                   |
| 2' x 4' Drop-in Ceiling Tile with Long Fissures and Pinholes | Throughout A Wing                                                                   |
| 1' x 1' Ceiling Tile and Glue                                | Gym, Stage                                                                          |
| Duct Felt Tape                                               | A Wing Penthouse, A103 Restroom                                                     |
| 12" x 12" Floor Tile and Mastic, Light Gray and Yellow/Tan   | A100, B Hall                                                                        |
| Chalkboard Mastic, Brown                                     | A100, A104, A108                                                                    |
| Lay-in Ceiling Tile                                          | A103 Restroom, B Hall (West), B Hall Main Corridor, Library                         |
| MJP Pipe Fittings                                            | A112 (now part of Library and Hall), Main Entrance, Doors Between West B and A Wing |
| Cove Base and Mastic                                         | A114 (now part of Library and Hall)                                                 |
| Hard Fitting                                                 | Boiler Room                                                                         |

| Material                                   | Location                                       |
|--------------------------------------------|------------------------------------------------|
| Exterior Boiler Insulation                 | Boiler Room                                    |
| Interior Boiler Insulation                 | Boiler Room                                    |
| Boiler Door Gasket                         | Boiler Room                                    |
| Chalkboard Mastic, Tan                     | C106                                           |
| Ceramic Tile and Grout                     | Kitchen, Boy's Locker Room, Girl's Locker Room |
| Carpet Mastic and Leveling Compound        | Library                                        |
| Wall and Ceiling Plaster                   | Boy's Locker Room, Girl's Locker Room          |
| Glued-on Ceiling Tiles                     | Main Corridor                                  |
| Brick Mortar                               | Main Entrance                                  |
| Sheet Flooring and Mastic, Tan             | Restroom 4                                     |
| Grey Sink Undercoating                     | Staff Room                                     |
| Door Insulation, Off White                 | Doors between West B Hall and A Wing           |
| Hard Fitting on Fiberglass Insulated Lines | Cafeteria Mechanical Loft                      |

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**



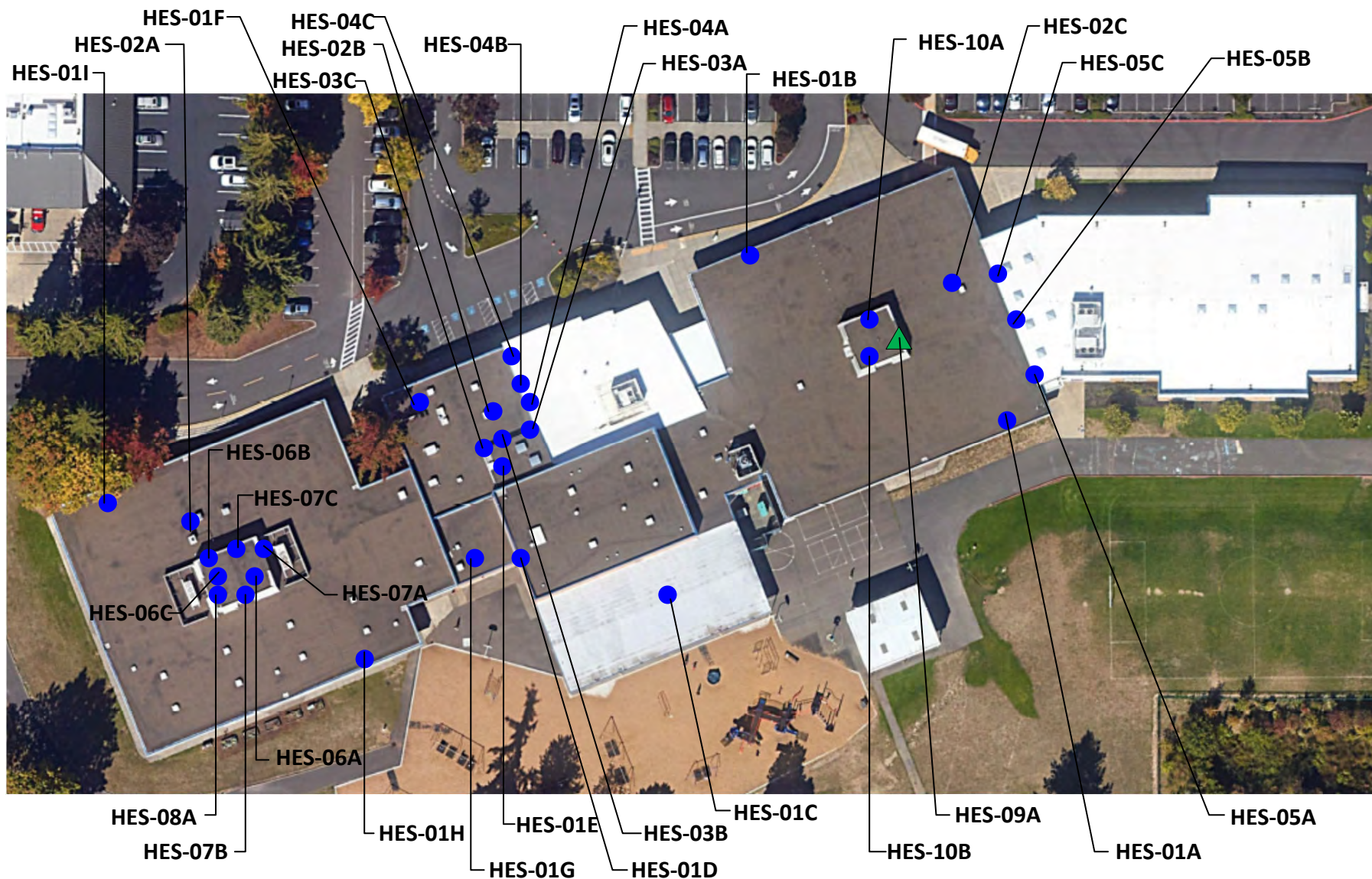
Matthew Cuda  
Project Manager



Ron Landolt, CAC  
NW Region BSI Practice Manager

## **Appendix A – Figure(s)**





#### LEGEND

- — Non-Asbestos Sample Location
- ★ — Asbestos-Containing Sample Location
- ▲ — OSHA Regulated Sample Location

#### ASBESTOS SURVEY REPORT SAMPLE LOCATION DIAGRAM

HITEON ELEMENTARY SCHOOL  
13800 SW BROCKMAN STREET  
BEAVERTON, OREGON 97005

TRC Project No.: 401824.0001

Figure: 1.1

Drawn by: MC

Reviewed by: RAL

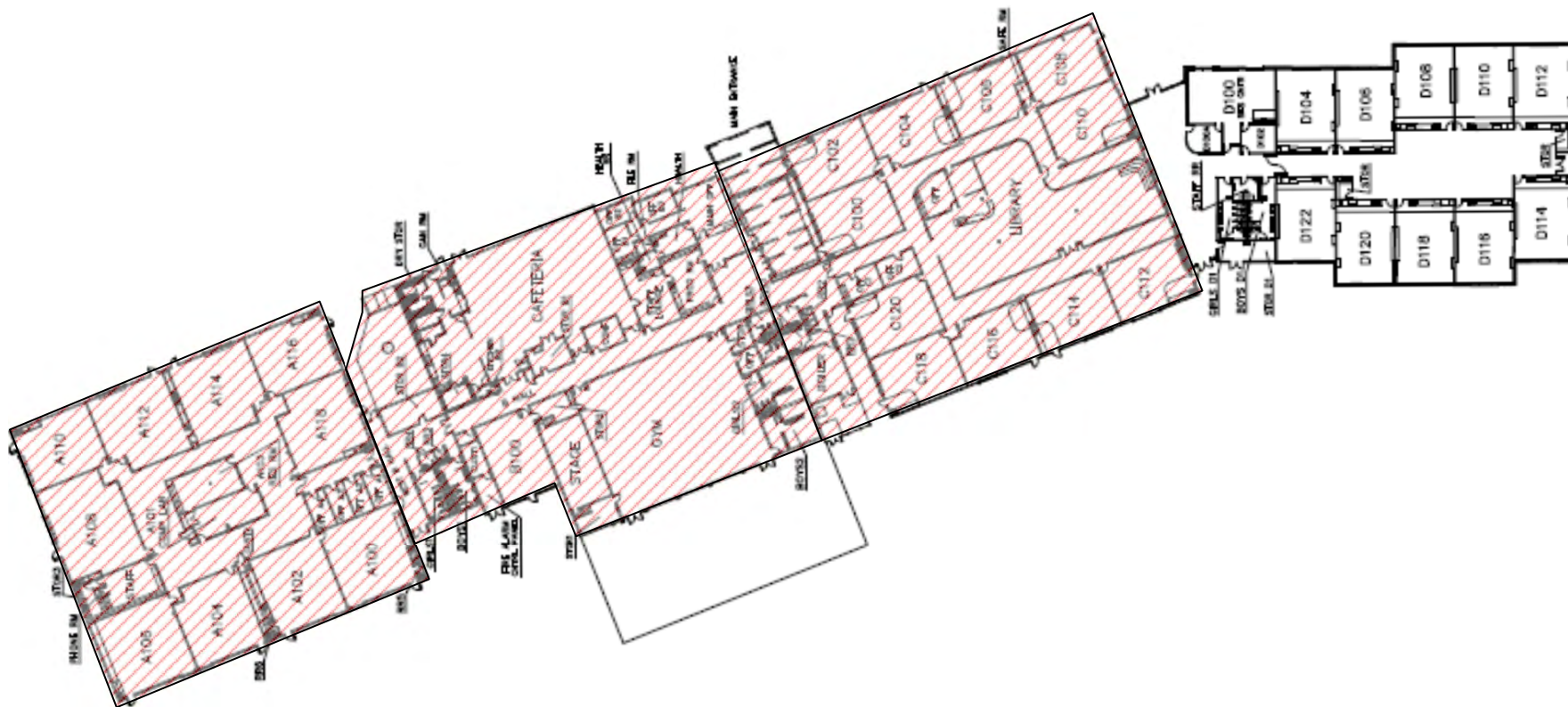
Date: July 2020



4105 SE International Way, Suite 505  
Milwaukie, Oregon 97222  
Phone: (503) 387-3251 Fax: (503) 908-1318







#### LEGEND



— OSHA Regulated Gypsum Board and Joint Compound (Composite <1%) – Based on a mix of current and prior sampling data.

#### ASBESTOS SURVEY REPORT OSHA REGULATED MATERIAL LOCATION DIAGRAM

HITEON ELEMENTARY SCHOOL  
13800 SW BROCKMAN STREET  
BEAVERTON, OREGON 970005

TRC Project No.: 401824.0001

Figure: 1.3

Drawn by: MC

Reviewed by: RAL

Date: July 2020



4105 SE International Way, Suite 505  
Milwaukie, Oregon 97222  
Phone: (5003) 387-3251 Fax: (5003) 908-1318

## **Appendix B – Laboratory Analytical Data Sheets**

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                                               |
|------------------------|--------------------|------------------------------------|----------------------|----------------------|------------------------------------------------------------------------------------------------------------|
| 0239577-001<br>HES-01A | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 15%<br>Synthetic Fiber 3%<br>Cellulose Fiber 2%<br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                    | LAYER 2<br>Roofing, Black/ Tan     | No                   | None Detected        | Cellulose Fiber 18%<br>Fibrous Glass 2%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                       |
|                        |                    | LAYER 3<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                                             |
|                        |                    | LAYER 4<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                                             |

Please see EMC Labs Sample Number 0239577-058 for Additional Layer(s)

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0239577**

## **Bulk Asbestos Analysis by Polarized Light Microscopy**

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                                               |
|------------------------|--------------------|------------------------------------|----------------------|----------------------|------------------------------------------------------------------------------------------------------------|
| 0239577-002<br>HES-01B | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Cellulose Fiber 18%<br>Fibrous Glass 2%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                       |
|                        |                    | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 7%<br>Synthetic Fiber 3%<br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                    | LAYER 3<br>Roofing, Black/ Tan     | No                   | None Detected        | Cellulose Fiber 90%<br>Gypsum<br>Quartz<br>Binder/Filler 10%                                               |
|                        |                    | LAYER 4<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                                             |

**Please see EMC Labs Sample Number 0239577-059 for Additional Layer(s)**

# EMC LABS, INC.

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Laboratory Report

**0239577**

## **Bulk Asbestos Analysis by Polarized Light Microscopy**

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents |
|------------------------|--------------------|------------------------------------|----------------------|----------------------|------------------------------|
| 0239577-003<br>HES-01C | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Silver         | No                   | None Detected        | Cellulose Fiber <1%          |
|                        |                    |                                    |                      |                      | Carbonates                   |
|                        |                    |                                    |                      |                      | Quartz                       |
|                        |                    |                                    |                      |                      | Binder/Filler 99%            |
|                        |                    | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 17%            |
|                        |                    |                                    |                      |                      | Cellulose Fiber 3%           |
|                        |                    |                                    |                      |                      | Carbonates                   |
|                        |                    |                                    |                      |                      | Quartz                       |
|                        |                    |                                    |                      |                      | Binder/Filler 80%            |
|                        |                    | LAYER 3<br>Roofing, Black/ Tan     | No                   | None Detected        | Cellulose Fiber 85%          |
|                        |                    |                                    |                      |                      | Carbonates                   |
|                        |                    |                                    |                      |                      | Gypsum                       |
|                        |                    |                                    |                      |                      | Quartz                       |
|                        |                    |                                    |                      |                      | Perlite                      |
|                        |                    |                                    |                      |                      | Binder/Filler 15%            |
|                        |                    | LAYER 4<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%            |
|                        |                    |                                    |                      |                      | Carbonates                   |
|                        |                    |                                    |                      |                      | Quartz                       |
|                        |                    |                                    |                      |                      | Binder/Filler 80%            |

**Please see EMC Labs Sample Number 0239577-060 for Additional Layer(s)**

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Laboratory Report

**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                          |
|------------------------|--------------------|------------------------------------|----------------------|----------------------|---------------------------------------------------------------------------------------|
| 0239577-004<br>HES-01D | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 15%<br>Cellulose Fiber 5%<br>Carbonates<br>Quartz<br>Binder/Filler 80%  |
|                        |                    | LAYER 2<br>Roofing, Black/ Tan     | No                   | None Detected        | Cellulose Fiber 85%<br>Gypsum<br>Quartz<br>Carbonates<br>Perlite<br>Binder/Filler 15% |
|                        |                    | LAYER 3<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                        |
|                        |                    | LAYER 4<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                        |

Please see EMC Labs Sample Number 0239577-061 for Additional Layer(s)

|                        |                    |                           |    |               |                                                                                                            |
|------------------------|--------------------|---------------------------|----|---------------|------------------------------------------------------------------------------------------------------------|
| 0239577-005<br>HES-01E | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Black | No | None Detected | Cellulose Fiber 20%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                                           |
|                        |                    | LAYER 2<br>Roofing, Black | No | None Detected | Fibrous Glass 15%<br>Cellulose Fiber 5%<br>Carbonates<br>Quartz<br>Binder/Filler 80%                       |
|                        |                    | LAYER 3<br>Roofing, Black | No | None Detected | Fibrous Glass 15%<br>Synthetic Fiber 3%<br>Cellulose Fiber 2%<br>Carbonates<br>Quartz<br>Binder/Filler 80% |

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                          |
|------------------------|--------------------|------------------------------------|----------------------|----------------------|---------------------------------------------------------------------------------------|
| 0239577-006<br>HES-01F | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 17%<br>Cellulose Fiber 3%<br>Carbonates<br>Quartz<br>Binder/Filler 80%  |
|                        |                    | LAYER 2<br>Roofing, Black/ Tan     | No                   | None Detected        | Cellulose Fiber 85%<br>Gypsum<br>Quartz<br>Carbonates<br>Perlite<br>Binder/Filler 15% |
|                        |                    | LAYER 3<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Perlite<br>Binder/Filler 80%                       |
|                        |                    | LAYER 4<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Perlite<br>Binder/Filler 80%                       |

**Please see EMC Labs Sample Number 0239577-062 for Additional Layer(s)**

|                        |                    |                                |    |               |                                                                                                            |
|------------------------|--------------------|--------------------------------|----|---------------|------------------------------------------------------------------------------------------------------------|
| 0239577-007<br>HES-01G | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Black      | No | None Detected | Fibrous Glass 15%<br>Synthetic Fiber 3%<br>Cellulose Fiber 2%<br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                    | LAYER 2<br>Roofing, Black/ Tan | No | None Detected | Cellulose Fiber 85%<br>Gypsum<br>Quartz<br>Carbonates<br>Perlite<br>Binder/Filler 15%                      |

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
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Laboratory Report

**0239577**

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NVLAP#101926-0

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| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/07/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                                               |
|------------------------|--------------------|------------------------------------|----------------------|----------------------|------------------------------------------------------------------------------------------------------------|
| 0239577-008<br>HES-01H | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 15%<br>Synthetic Fiber 3%<br>Cellulose Fiber 2%<br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                    | LAYER 2<br>Roofing, Black/ Tan     | No                   | None Detected        | Cellulose Fiber 85%<br>Gypsum<br>Quartz<br>Carbonates<br>Perlite<br>Binder/Filler 15%                      |
|                        |                    | LAYER 3<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Perlite<br>Binder/Filler 80%                                            |
|                        |                    | LAYER 4<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br>Carbonates<br>Perlite<br>Binder/Filler 80%                                            |

Please see EMC Labs Sample Number 0239577-063 for Additional Layer(s)



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## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/07/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location | Layer Name /<br>Sample Description                                    | Asbestos<br>Detected | Asbestos Type<br>(%)       | Non-Asbestos<br>Constituents                                                                               |                |                                            |               |                                            |
|------------------------|--------------------|-----------------------------------------------------------------------|----------------------|----------------------------|------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------|---------------|--------------------------------------------|
| 0239577-009<br>HES-011 | THROUGHOUT<br>ROOF | LAYER 1<br>Roofing, Black                                             | No                   | None Detected              | Fibrous Glass 15%<br>Synthetic Fiber 3%<br>Cellulose Fiber 2%<br>Carbonates<br>Quartz<br>Binder/Filler 80% |                |                                            |               |                                            |
|                        |                    | LAYER 2<br>Roofing, Black/ Tan                                        | No                   | None Detected              | Cellulose Fiber 85%<br>Gypsum<br>Quartz<br>Carbonates<br>Perlite<br>Binder/Filler 15%                      |                |                                            |               |                                            |
|                        |                    | LAYER 3<br>Roofing, Black                                             | No                   | None Detected              | Fibrous Glass 20%<br>Carbonates<br>Perlite<br>Binder/Filler 80%                                            |                |                                            |               |                                            |
|                        |                    | LAYER 4<br>Roofing, Black                                             | No                   | None Detected              | Fibrous Glass 20%<br>Carbonates<br>Perlite<br>Binder/Filler 80%                                            |                |                                            |               |                                            |
|                        |                    | Please see EMC Labs Sample Number 0239577-064 for Additional Layer(s) |                      |                            |                                                                                                            |                |                                            |               |                                            |
|                        |                    | 0239577-010<br>HES-02A                                                | ROOF                 | LAYER 1<br>Caulking, Gray  | No                                                                                                         | None Detected  | Carbonates<br>Quartz<br>Binder/Filler 100% |               |                                            |
|                        |                    |                                                                       |                      | LAYER 2<br>Coating, Silver | No                                                                                                         | None Detected  | Carbonates<br>Quartz<br>Binder/Filler 100% |               |                                            |
|                        |                    |                                                                       |                      | 0239577-011<br>HES-02B     | ROOF                                                                                                       | Caulking, Gray | No                                         | None Detected | Carbonates<br>Quartz<br>Binder/Filler 100% |

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NVLAP#101926-0

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| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                                   |
|------------------------|-----------------------------------|------------------------------------|----------------------|----------------------|------------------------------------------------------------------------------------------------|
| 0239577-012<br>HES-02C | ROOF                              | Caulking, Gray                     | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                                                  |
| 0239577-013<br>HES-03A | ROOF                              | Felt, Black                        | No                   | None Detected        | Fibrous Glass<br>Synthetic Fiber<br>Carbonates<br>Quartz<br>Binder/Filler<br>30%<br>10%<br>60% |
| 0239577-014<br>HES-03B | ROOF                              | Felt, Black                        | No                   | None Detected        | Fibrous Glass<br>Synthetic Fiber<br>Carbonates<br>Quartz<br>Binder/Filler<br>30%<br>10%<br>60% |
| 0239577-015<br>HES-03C | ROOF                              | Felt, Black                        | No                   | None Detected        | Fibrous Glass<br>Synthetic Fiber<br>Carbonates<br>Quartz<br>Binder/Filler<br>30%<br>10%<br>60% |
| 0239577-016<br>HES-04A | ROOFING AT EDGE<br>OF TPO ROOFING | Caulking, Black                    | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                                                  |
| 0239577-017<br>HES-04B | ROOFING AT EDGE<br>OF TPO ROOFING | Caulking, Black                    | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                                                  |

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| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                                                       | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                         |
|------------------------|--------------------------------------------------------------------------|------------------------------------|----------------------|----------------------|--------------------------------------------------------------------------------------|
| 0239577-018<br>HES-04C | ROOFING AT EDGE<br>OF TPO ROOFING                                        | Caulking, Black                    | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                                        |
| 0239577-019<br>HES-05A | ROOFING AT EDGE<br>OF TPO ROOFING                                        | Roofing Mastic, White/ Gray        | No                   | None Detected        | Talc<br>1%<br><br>Carbonates<br>Gypsum<br>Quartz<br>Binder/Filler<br>99%             |
| 0239577-020<br>HES-05B | ROOFING AT EDGE<br>OF TPO ROOFING                                        | Roofing Mastic, White/ Gray        | No                   | None Detected        | Talc<br>1%<br><br>Carbonates<br>Gypsum<br>Quartz<br>Binder/Filler<br>99%             |
| 0239577-021<br>HES-05C | ROOFING AT EDGE<br>OF TPO ROOFING                                        | Roofing Mastic, White/ Gray        | No                   | None Detected        | Talc<br>1%<br><br>Carbonates<br>Gypsum<br>Quartz<br>Binder/Filler<br>99%             |
| 0239577-022<br>HES-06A | A WING<br>MECHANICAL<br>MEZZANINE,<br>VARIOUS HVAC<br>DUCT<br>COMPONENTS | Duct Tape, White/ Tan              | No                   | None Detected        | Cellulose Fiber<br>20%<br><br>Carbonates<br>Gypsum<br>Quartz<br>Binder/Filler<br>80% |

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| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
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| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                                                       | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                    |      |
|------------------------|--------------------------------------------------------------------------|------------------------------------|----------------------|----------------------|-------------------------------------------------|------|
| 0239577-023<br>HES-06B | A WING<br>MECHANICAL<br>MEZZANINE,<br>VARIOUS HVAC<br>DUCT<br>COMPONENTS | Duct Tape, White/ Tan              | No                   | None Detected        | Cellulose Fiber                                 | 20%  |
|                        |                                                                          |                                    |                      |                      | Carbonates<br>Gypsum<br>Quartz<br>Binder/Filler | 80%  |
| 0239577-024<br>HES-06C | A WING<br>MECHANICAL<br>MEZZANINE,<br>VARIOUS HVAC<br>DUCT<br>COMPONENTS | Duct Tape, White/ Tan              | No                   | None Detected        | Cellulose Fiber                                 | 20%  |
|                        |                                                                          |                                    |                      |                      | Carbonates<br>Gypsum<br>Quartz<br>Binder/Filler | 80%  |
| 0239577-025<br>HES-07A | A WING<br>MECHANICAL<br>MEZZANINE                                        | Caulking, Gray                     | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler           | 100% |
| 0239577-026<br>HES-07B | A WING<br>MECHANICAL<br>MEZZANINE                                        | Caulking, Gray                     | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler           | 100% |

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| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                | Layer Name /<br>Sample Description    | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                      |
|------------------------|-----------------------------------|---------------------------------------|----------------------|----------------------|-----------------------------------------------------------------------------------|
| 0239577-027<br>HES-07C | A WING<br>MECHANICAL<br>MEZZANINE | Caulking, Gray                        | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                                     |
| 0239577-028<br>HES-08A | THROUGHOUT A<br>WING              | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber<br>Fibrous Glass<br>Gypsum<br>Quartz<br>Carbonates<br>Mica<br>88% |
|                        |                                   | LAYER 2<br>Joint Compound, Off White  | No                   | None Detected        | Carbonates<br>Mica<br>Quartz<br>Binder/Filler<br>100%                             |
| 0239577-029<br>HES-08B | THROUGHOUT A<br>WING              | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber<br>Fibrous Glass<br>Gypsum<br>Quartz<br>Carbonates<br>Mica<br>88% |
|                        |                                   | LAYER 2<br>Joint Compound, Off White  | No                   | None Detected        | Carbonates<br>Mica<br>Quartz<br>Binder/Filler<br>100%                             |

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| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location   | Layer Name /<br>Sample Description    | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                          |
|------------------------|----------------------|---------------------------------------|----------------------|----------------------|---------------------------------------------------------------------------------------|
| 0239577-030<br>HES-08C | THROUGHOUT A<br>WING | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 2%<br>Gypsum<br>Quartz<br>Carbonates<br>Mica 88% |
|                        |                      | LAYER 2<br>Joint Compound, Off White  | No                   | None Detected        | Carbonates<br>Mica<br>Quartz<br>Binder/Filler 100%                                    |
|                        |                      |                                       |                      |                      |                                                                                       |
|                        |                      |                                       |                      |                      |                                                                                       |
| 0239577-031<br>HES-09A | THROUGHOUT C<br>WING | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 2%<br>Gypsum<br>Quartz<br>Carbonates<br>Mica 88% |
|                        |                      | LAYER 2<br>Joint Compound, Off White  | Yes                  | Chrysotile 3%        | Cellulose Fiber <1%<br>Carbonates<br>Mica<br>Quartz<br>Binder/Filler 96%              |
|                        |                      |                                       |                      |                      |                                                                                       |
|                        |                      |                                       |                      |                      |                                                                                       |

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| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location   | Layer Name /<br>Sample Description    | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                          |
|------------------------|----------------------|---------------------------------------|----------------------|----------------------|---------------------------------------------------------------------------------------|
| 0239577-032<br>HES-09B | THROUGHOUT C<br>WING | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 2%<br>Gypsum<br>Quartz<br>Carbonates<br>Mica 88% |
|                        |                      | LAYER 2<br>Joint Compound, Off White  | Yes                  | Chrysotile 2%        | Carbonates<br>Mica<br>Quartz<br>Binder/Filler 98%                                     |
|                        |                      | LAYER 3<br>Texture, Off White         | No                   | None Detected        | Carbonates<br>Mica<br>Quartz<br>Perlite<br>Binder/Filler 100%                         |
| 0239577-033<br>HES-09C | THROUGHOUT C<br>WING | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 2%<br>Gypsum<br>Quartz<br>Carbonates<br>Mica 88% |
|                        |                      | LAYER 2<br>Joint Compound, Off White  | Yes                  | Chrysotile 2%        | Carbonates<br>Mica<br>Quartz<br>Binder/Filler 98%                                     |

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| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                                                 | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                   |
|------------------------|--------------------------------------------------------------------|------------------------------------|----------------------|----------------------|----------------------------------------------------------------|
| 0239577-034<br>HES-10A | C WING<br>MECHANICAL<br>MEZZANINE<br>THROUGHOUT<br>PLUMBING SYSTEM | LAYER 1<br>Hard Fitting, Gray      | No                   | None Detected        | Cellulose Fiber 15%<br>Mineral Wool 15%                        |
|                        |                                                                    |                                    |                      |                      | Carbonates<br>Gypsum<br>Quartz<br>Perlite<br>Binder/Filler 70% |
|                        |                                                                    | LAYER 2<br>Hard Fitting, Beige     | No                   | None Detected        | Cellulose Fiber 15%<br>Wollastonite 5%                         |
|                        |                                                                    |                                    |                      |                      | Quartz<br>Mica<br>Gypsum<br>Carbonates<br>Binder/Filler 80%    |
|                        |                                                                    | LAYER 3<br>Hard Fitting, White     | No                   | None Detected        | Cellulose Fiber 95%                                            |
|                        |                                                                    |                                    |                      |                      | Carbonates<br>Gypsum<br>Binder/Filler 5%                       |
|                        |                                                                    |                                    |                      |                      |                                                                |
|                        |                                                                    |                                    |                      |                      |                                                                |
|                        |                                                                    |                                    |                      |                      |                                                                |
| 0239577-035<br>HES-10B | C WING<br>MECHANICAL<br>MEZZANINE<br>THROUGHOUT<br>PLUMBING SYSTEM | LAYER 1<br>Hard Fitting, Gray      | No                   | None Detected        | Mineral Wool 30%                                               |
|                        |                                                                    |                                    |                      |                      | Carbonates<br>Gypsum<br>Quartz<br>Perlite<br>Binder/Filler 70% |
|                        |                                                                    | LAYER 2<br>Hard Fitting, White     | No                   | None Detected        | Cellulose Fiber 95%                                            |
|                        |                                                                    |                                    |                      |                      | Carbonates<br>Gypsum<br>Binder/Filler 5%                       |
|                        |                                                                    |                                    |                      |                      |                                                                |
|                        |                                                                    |                                    |                      |                      |                                                                |
|                        |                                                                    |                                    |                      |                      |                                                                |
|                        |                                                                    |                                    |                      |                      |                                                                |
|                        |                                                                    |                                    |                      |                      |                                                                |



# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                                                 | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents |     |
|------------------------|--------------------------------------------------------------------|------------------------------------|----------------------|----------------------|------------------------------|-----|
| 0239577-036<br>HES-10C | C WING<br>MECHANICAL<br>MEZZANINE<br>THROUGHOUT<br>PLUMBING SYSTEM | LAYER 1<br>Hard Fitting, Yellow    | No                   | None Detected        | Fibrous Glass                | 95% |
|                        |                                                                    |                                    |                      |                      | Carbonates                   | 5%  |
|                        |                                                                    | LAYER 2<br>Hard Fitting, Gray      | No                   | None Detected        | Mineral Wool                 | 30% |
|                        |                                                                    |                                    |                      |                      | Cellulose Fiber              | 5%  |
|                        |                                                                    |                                    |                      |                      | Carbonates                   |     |
|                        |                                                                    |                                    |                      |                      | Gypsum                       |     |
|                        |                                                                    |                                    |                      |                      | Quartz                       |     |
|                        |                                                                    |                                    |                      |                      | Perlite                      |     |
|                        |                                                                    |                                    |                      |                      | Binder/Filler                | 65% |
| 0239577-037<br>HES-11A | THROUGHOUT C<br>WING                                               | 2x4 Ceiling Tile, White/ Gray      | No                   | None Detected        | Cellulose Fiber              | 75% |
|                        |                                                                    |                                    |                      |                      | Mineral Wool                 | 5%  |
|                        |                                                                    |                                    |                      |                      | Carbonates                   |     |
|                        |                                                                    |                                    |                      |                      | Quartz                       |     |
|                        |                                                                    |                                    |                      |                      | Perlite                      |     |
| 0239577-038<br>HES-11B | THROUGHOUT C<br>WING                                               | 2x4 Ceiling Tile, White/ Gray      | No                   | None Detected        | Binder/Filler                | 20% |
|                        |                                                                    |                                    |                      |                      | Mineral Wool                 | 65% |
|                        |                                                                    |                                    |                      |                      | Cellulose Fiber              | 15% |
|                        |                                                                    |                                    |                      |                      | Carbonates                   |     |
|                        |                                                                    |                                    |                      |                      | Quartz                       |     |
| 0239577-039<br>HES-11C | THROUGHOUT C<br>WING                                               | 2x4 Ceiling Tile, White/ Gray      | No                   | None Detected        | Perlite                      |     |
|                        |                                                                    |                                    |                      |                      | Binder/Filler                | 20% |
|                        |                                                                    |                                    |                      |                      | Mineral Wool                 | 65% |
|                        |                                                                    |                                    |                      |                      | Cellulose Fiber              | 15% |
|                        |                                                                    |                                    |                      |                      | Carbonates                   |     |

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**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                             | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                        |
|------------------------|------------------------------------------------|------------------------------------|----------------------|----------------------|---------------------------------------------------------------------|
| 0239577-040<br>HES-12A | HVAC DUCTS<br>THROUGHOUT                       | HVAC Duct Mastic, Gray             | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                       |
| 0239577-041<br>HES-12B | HVAC DUCTS<br>THROUGHOUT                       | HVAC Duct Mastic, Gray             | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                       |
| 0239577-042<br>HES-12C | HVAC DUCTS<br>THROUGHOUT                       | HVAC Duct Mastic, Gray             | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                       |
| 0239577-043<br>HES-13A | ABOVE CEILING<br>APPEARS TO BE<br>FROM ROOFING | Mastic, Black                      | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                       |
| 0239577-044<br>HES-13B | ABOVE CEILING<br>APPEARS TO BE<br>FROM ROOFING | Mastic, Black                      | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100%                       |
| 0239577-045<br>HES-13C | ABOVE CEILING<br>APPEARS TO BE<br>FROM ROOFING | Mastic, Black                      | No                   | None Detected        | Fibrous Glass<br>Carbonates<br>Quartz<br>Binder/Filler<br>1%<br>99% |

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**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location   | Layer Name /<br>Sample Description    | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                                   |
|------------------------|----------------------|---------------------------------------|----------------------|----------------------|------------------------------------------------------------------------------------------------|
| 0239577-046<br>HES-14A | THROUGHOUT B<br>WING | 2x4 Ceiling Tile, White/ Gray         | No                   | None Detected        | Cellulose Fiber 75%<br>Mineral Wool 5%<br>Carbonates<br>Quartz<br>Perlite<br>Binder/Filler 20% |
| 0239577-047<br>HES-14B | THROUGHOUT B<br>WING | 2x4 Ceiling Tile, White/ Gray         | No                   | None Detected        | Cellulose Fiber 75%<br>Mineral Wool 5%<br>Carbonates<br>Quartz<br>Perlite<br>Binder/Filler 20% |
| 0239577-048<br>HES-14C | THROUGHOUT B<br>WING | 2x4 Ceiling Tile, White/ Gray         | No                   | None Detected        | Cellulose Fiber 75%<br>Mineral Wool 5%<br>Carbonates<br>Quartz<br>Perlite<br>Binder/Filler 20% |
| 0239577-049<br>HES-15A | THROUGHOUT B<br>WING | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 2%<br>Gypsum<br>Quartz<br>Carbonates<br>Mica 88%          |
|                        |                      | LAYER 2<br>Joint Compound, Off White  | No                   | None Detected        | Carbonates<br>Mica<br>Quartz<br>Perlite<br>Binder/Filler 100%                                  |

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**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location   | Layer Name /<br>Sample Description    | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                                    |
|------------------------|----------------------|---------------------------------------|----------------------|----------------------|-------------------------------------------------------------------------------------------------|
| 0239577-050<br>HES-15B | THROUGHOUT B<br>WING | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 2%<br>Gypsum<br>Quartz<br>Carbonates<br>Mica 88%           |
|                        |                      | LAYER 2<br>Joint Compound, Off White  | No                   | None Detected        | Carbonates<br>Mica<br>Quartz<br>Perlite<br>Binder/Filler 100%                                   |
|                        |                      |                                       |                      |                      |                                                                                                 |
|                        |                      |                                       |                      |                      |                                                                                                 |
| 0239577-051<br>HES-15C | THROUGHOUT B<br>WING | LAYER 1<br>Gypsum Board, White/ Brown | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 2%<br>Gypsum<br>Quartz<br>Carbonates<br>Mica 88%           |
|                        |                      | LAYER 2<br>Joint Compound, Off White  | No                   | None Detected        | Carbonates<br>Mica<br>Quartz<br>Binder/Filler 100%                                              |
|                        |                      |                                       |                      |                      |                                                                                                 |
|                        |                      |                                       |                      |                      |                                                                                                 |
| 0239577-052<br>HES-16A | THROUGHOUT A<br>WING | 2x4 Ceiling Tile, White/ Gray         | No                   | None Detected        | Cellulose Fiber 40%<br>Mineral Wool 40%<br>Carbonates<br>Quartz<br>Perlite<br>Binder/Filler 20% |
|                        |                      |                                       |                      |                      |                                                                                                 |
| 0239577-053<br>HES-16B | THROUGHOUT A<br>WING | 2x4 Ceiling Tile, White/ Gray         | No                   | None Detected        | Cellulose Fiber 40%<br>Mineral Wool 40%<br>Carbonates<br>Quartz<br>Perlite<br>Binder/Filler 20% |
|                        |                      |                                       |                      |                      |                                                                                                 |

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**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/02/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location   | Layer Name /<br>Sample Description      | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                                                    |
|------------------------|----------------------|-----------------------------------------|----------------------|----------------------|-------------------------------------------------------------------------------------------------|
| 0239577-054<br>HES-16C | THROUGHOUT A<br>WING | 2x4 Ceiling Tile, White/ Gray           | No                   | None Detected        | Cellulose Fiber 40%<br>Mineral Wool 40%<br>Carbonates<br>Quartz<br>Perlite<br>Binder/Filler 20% |
| 0239577-055<br>HES-17A | GYM STAGE            | LAYER 1<br>1x1 Ceiling Tile, White/ Tan | No                   | None Detected        | Cellulose Fiber 85%<br>Carbonates<br>Gypsum<br>Binder/Filler 15%                                |
|                        |                      | LAYER 2<br>Glue, Dk. Brown              | No                   | None Detected        | Cellulose Fiber 1%<br>Carbonates<br>Quartz<br>Binder/Filler 99%                                 |
| 0239577-056<br>HES-17B | GYM STAGE            | LAYER 1<br>1x1 Ceiling Tile, White/ Tan | No                   | None Detected        | Cellulose Fiber 85%<br>Carbonates<br>Gypsum<br>Binder/Filler 15%                                |
|                        |                      | LAYER 2<br>Glue, Dk. Brown              | No                   | None Detected        | Cellulose Fiber <1%<br>Carbonates<br>Quartz<br>Binder/Filler 99%                                |
| 0239577-057<br>HES-17C | GYM STAGE            | LAYER 1<br>1x1 Ceiling Tile, White/ Tan | No                   | None Detected        | Cellulose Fiber 85%<br>Carbonates<br>Gypsum<br>Binder/Filler 15%                                |
|                        |                      | LAYER 2<br>Glue, Dk. Brown              | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler 100%                                                      |

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Laboratory Report

**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/07/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                           | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                     |
|------------------------|----------------------------------------------|------------------------------------|----------------------|----------------------|--------------------------------------------------|
| 0239577-058<br>HES-01A | THROUGHOUT<br>ROOF -<br>ADDITIONAL<br>LAYERS | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%                                |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80%        |
|                        |                                              | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%                                |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80%        |
|                        |                                              | LAYER 3<br>Insulation, Tan         | No                   | None Detected        | Cellulose Fiber 85%                              |
|                        |                                              |                                    |                      |                      | Gypsum<br>Quartz<br>Perlite<br>Binder/Filler 15% |
| 0239577-059<br>HES-01B | THROUGHOUT<br>ROOF -<br>ADDITIONAL<br>LAYERS | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%                                |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80%        |
|                        |                                              | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%                                |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80%        |
|                        |                                              | LAYER 3<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 17%<br>Cellulose Fiber 3%          |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80%        |
|                        |                                              | LAYER 4<br>Insulation, Tan         | No                   | None Detected        | Cellulose Fiber 85%                              |
|                        |                                              |                                    |                      |                      | Gypsum<br>Quartz<br>Perlite<br>Binder/Filler 15% |

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Laboratory Report

**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/01/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/07/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/07/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID    | Sample<br>Location                           | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents              |
|------------------------|----------------------------------------------|------------------------------------|----------------------|----------------------|-------------------------------------------|
| 0239577-060<br>HES-01C | THROUGHOUT<br>ROOF -<br>ADDITIONAL<br>LAYERS | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%                         |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%                         |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 3<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%                         |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 4<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 17%                         |
|                        |                                              |                                    |                      |                      | Cellulose Fiber 3%                        |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              |                                    |                      |                      |                                           |
|                        |                                              |                                    |                      |                      |                                           |
|                        |                                              |                                    |                      |                      |                                           |

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## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client: TRC SOLUTIONS Job# / P.O. #: 401824  
Address: 4105 SE INTERNATIONAL WAY, STE 505 Date Received: 07/01/2020  
MILWAUKIE OR 97222 Date Analyzed: 07/07/2020  
Collected: 06/29/2020 Date Reported: 07/07/2020  
Project Name: HITEON ELEMENTARY HVAC UPGRADE EPA Method: EPA 600/R-93/116  
Address: Submitted By: MATT CUDA  
Collected By:

| Lab ID<br>Client ID    | Sample<br>Location                           | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                       |
|------------------------|----------------------------------------------|------------------------------------|----------------------|----------------------|--------------------------------------------------------------------|
| 0239577-061<br>HES-01D | THROUGHOUT<br>ROOF -<br>ADDITIONAL<br>LAYERS | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br><br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br><br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 3<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br><br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 4<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br><br>Carbonates<br>Quartz<br>Binder/Filler 80% |
| 0239577-062<br>HES-01F | THROUGHOUT<br>ROOF -<br>ADDITIONAL<br>LAYERS | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br><br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br><br>Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 3<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%<br><br>Carbonates<br>Quartz<br>Binder/Filler 80% |



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**0239577**

## Bulk Asbestos Analysis by Polarized Light Microscopy

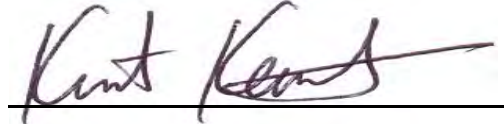
NVLAP#101926-0

Client: TRC SOLUTIONS Job# / P.O. #: 401824  
Address: 4105 SE INTERNATIONAL WAY, STE 505 Date Received: 07/01/2020  
MILWAUKIE OR 97222 Date Analyzed: 07/07/2020  
Collected: 06/29/2020 Date Reported: 07/07/2020  
Project Name: HITEON ELEMENTARY HVAC UPGRADE EPA Method: EPA 600/R-93/116  
Address: Submitted By: MATT CUDA  
Collected By:

| Lab ID<br>Client ID    | Sample<br>Location                           | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents              |
|------------------------|----------------------------------------------|------------------------------------|----------------------|----------------------|-------------------------------------------|
| 0239577-063<br>HES-01H | THROUGHOUT<br>ROOF -<br>ADDITIONAL<br>LAYERS | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Fibrous Glass 20%                         |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Cellulose Fiber 15%                       |
|                        |                                              |                                    |                      |                      | Fibrous Glass 5%                          |
| 0239577-064<br>HES-01I | THROUGHOUT<br>ROOF -<br>ADDITIONAL<br>LAYERS | LAYER 1<br>Roofing, Black          | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler 80% |
|                        |                                              |                                    |                      |                      | Fibrous Glass 15%                         |
|                        |                                              | LAYER 2<br>Roofing, Black          | No                   | None Detected        | Cellulose Fiber 5%                        |
|                        |                                              |                                    |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80% |



Analyst - Octavio Gavarreteayestas



Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicated or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. These reports are for the exclusive use of the addressed client and that they will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of thirty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method for asbestos. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. Polarized Light Microscopy may not be consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials.

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report  
**0239866**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 401824           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 07/08/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 07/10/2020       |
| Collected:    | 06/29/2020                         | Date Reported: | 07/10/2020       |
| Project Name: | HITEON ELEMENTARY HVAC UPGRADE     | EPA Method:    | EPA 600/R-93/116 |
| Address:      | POINT COUNT LAB #239577            | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID | Sample<br>Location | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents |
|---------------------|--------------------|------------------------------------|----------------------|----------------------|------------------------------|
|---------------------|--------------------|------------------------------------|----------------------|----------------------|------------------------------|

|                        |                      |                                                                       |     |            |      |                                                                                             |                                       |
|------------------------|----------------------|-----------------------------------------------------------------------|-----|------------|------|---------------------------------------------------------------------------------------------|---------------------------------------|
| 0239866-001<br>HES-09A | THROUGHOUT C<br>WING | Gypsum Board/ Joint Compound<br>Composite, White/ Brown/ Off<br>White | Yes | Chrysotile | 0.5% | Cellulose Fiber<br>Fibrous Glass<br>Gypsum<br>Quartz<br>Carbonates<br>Mica<br>Binder/Filler | 8.6%<br>1.7%<br><br><br><br><br>89.2% |
|------------------------|----------------------|-----------------------------------------------------------------------|-----|------------|------|---------------------------------------------------------------------------------------------|---------------------------------------|

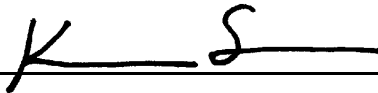
### COMPOSITE ANALYSIS; 400 Pt. POINT COUNT

|                        |                      |                                                                       |     |            |      |                                                                                             |                                       |
|------------------------|----------------------|-----------------------------------------------------------------------|-----|------------|------|---------------------------------------------------------------------------------------------|---------------------------------------|
| 0239866-002<br>HES-09B | THROUGHOUT C<br>WING | Gypsum Board/ Joint Compound<br>Composite, White/ Brown/ Off<br>White | Yes | Chrysotile | 0.3% | Cellulose Fiber<br>Fibrous Glass<br>Gypsum<br>Quartz<br>Carbonates<br>Mica<br>Binder/Filler | 8.6%<br>1.7%<br><br><br><br><br>89.4% |
|------------------------|----------------------|-----------------------------------------------------------------------|-----|------------|------|---------------------------------------------------------------------------------------------|---------------------------------------|

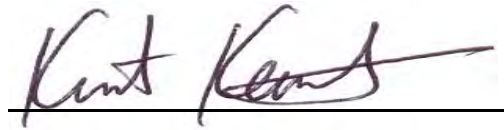
### COMPOSITE ANALYSIS; 400 Pt. POINT COUNT

|                        |                      |                                                                       |     |            |      |                                                                                             |                                       |
|------------------------|----------------------|-----------------------------------------------------------------------|-----|------------|------|---------------------------------------------------------------------------------------------|---------------------------------------|
| 0239866-003<br>HES-09C | THROUGHOUT C<br>WING | Gypsum Board/ Joint Compound<br>Composite, White/ Brown/ Off<br>White | Yes | Chrysotile | 0.4% | Cellulose Fiber<br>Fibrous Glass<br>Gypsum<br>Quartz<br>Carbonates<br>Mica<br>Binder/Filler | 8.5%<br>1.7%<br><br><br><br><br>89.4% |
|------------------------|----------------------|-----------------------------------------------------------------------|-----|------------|------|---------------------------------------------------------------------------------------------|---------------------------------------|

### COMPOSITE ANALYSIS; 400 Pt. POINT COUNT



Analyst - Kenneth Scheske



Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicated or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. These reports are for the exclusive use of the addressed client and that they will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of thirty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method for asbestos. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. Polarized Light Microscopy may not be consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials.

# CHAIN OF CUSTODY

EMC Labs, Inc.  
9830 S. 51<sup>st</sup> St., Ste B-109  
Phoenix, AZ 85044  
(800) 362-3373 Fax (480) 893-1726

LAB#: 239577  
TAT: 3 day  
Rec'd: JUL 01 AM

COMPANY NAME: **TRC SOLUTIONS**  
4105 SE International Way, Suite 505  
Milwaukie, Oregon 97222  
CONTACT: Ron Landolt **Scan & Excel**  
Phone/Fax: (503) 387-3251 / (503) 908-1318  
Email: rlandolt@trccompanies.com and mcuda@trccompanies.com

BILL TO: (If Different Location)  
Phoenix, AZ

Now Accepting: **VISA – MASTERCARD**

Price Quoted: \$ \_\_\_\_\_ / Sample \$ \_\_\_\_\_ / Layers

**COMPLETE ITEMS 1-4:** (Failure to complete any items may cause a delay in processing or analyzing your samples)

**1. TURNAROUND TIME:** [4hr rush] [8hr rush] [1-Day] [2-Day] [3-Day] [5-Day] [6-10 Day]

\*\*\*Prior confirmation of turnaround time is required

\*\*\*Additional charges for rush analysis (please call marketing department for pricing details)

\*\*\*Laboratory analysis may be subject to delay if credit terms are not met

**2. TYPE OF ANALYSIS:** [Bulk-PCM] [Air-PCM] [Lead] [Point Count] [Fungi: AOC, W-C, Bulk, Swab, Tape]

**3. DISPOSAL INSTRUCTIONS:** [Dispose of samples at EMC] / [Return samples to me at my expense]

(If you do not indicate preference, EMC will dispose of samples 60 days from analysis.)

**4. Project Name:** Hiteon Elementary HVAC Upgrade

P.O. Number: \_\_\_\_\_ Project Number: 401824

| EMC<br>SAMPLE<br># | CLIENT<br>SAMPLE # | DATE & TIME<br>SAMPLED | LOCATION/MATERIAL<br>TYPE | Samples<br>Accepted<br>Yes / No | AIR SAMPLE INFO / COMMENTS |     |              |
|--------------------|--------------------|------------------------|---------------------------|---------------------------------|----------------------------|-----|--------------|
|                    |                    |                        |                           |                                 | ON                         | OFF | FLOW<br>RATE |
| 1                  | HES-01A            | 6-29-20                | See Attached Field Logs   | N                               |                            |     |              |
|                    |                    |                        |                           | N                               |                            |     |              |
|                    |                    |                        |                           | N                               |                            |     |              |
|                    |                    |                        |                           | N                               |                            |     |              |
|                    |                    |                        |                           | N                               |                            |     |              |
|                    |                    |                        |                           | N                               |                            |     |              |
|                    |                    |                        |                           | N                               |                            |     |              |
| 57                 | HES-17C            |                        |                           | N                               |                            |     |              |
| 58                 |                    |                        |                           | N                               |                            |     |              |
| 59                 |                    |                        |                           | N                               |                            |     |              |
| 60                 |                    |                        |                           | N                               |                            |     |              |
| 61                 |                    |                        |                           | N                               |                            |     |              |
| 62                 |                    |                        |                           | N                               |                            |     |              |
| 63                 |                    |                        |                           | N                               |                            |     |              |
| 64                 |                    |                        |                           | N                               |                            |     |              |

**SPECIAL INSTRUCTIONS:**

Sample Collector: (Print) Matt Cuda (Signature) *[Signature]* 918  
Relinquished by: *[Signature]* Date/Time: 6-30-20 1500 Received by: *[Signature]* Date/Time: 7/1/20  
Relinquished by: *[Signature]* Date/Time: 7/1/20 Received by: *[Signature]* Date/Time: 7/1/20  
Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

\*\* In the event of any dispute between the above parties for these services or otherwise, parties agree that jurisdiction and venue will be in Phoenix, Arizona and prevailing party will be entitled to attorney's fees and court costs.



4105 SE International Way, Suite 505,  
Milwaukie, OR 97222

## ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM

|                                                                                                                                                   |                                            |                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------|
| Client:<br>Beaverton School District                                                                                                              | Project Number:<br>401824                  | Inspector(s):<br>Jason Stone, Matt Cuda |
| Project Name:<br>Hiteon Elementary School HVAC Upgrade Project<br>Hiteon Elementary School<br>13800 SW Brockman Street<br>Beaverton, Oregon 97005 | Tracking Number:                           | Requested TAT:<br>3 DAY                 |
| Email Results to:<br>mcuda@trccompanies.com,<br>rlandolt@trccompanies.com                                                                         | Analytical Method:<br>PLM EPA 600/R-93/116 | Lab Comments:                           |

### ASBESTOS BULK SAMPLE INFORMATION

| Date Collected | Sample Identification | Material Description | Homogeneous Area | Sample Location                    | Lab Identification (Lab Use Only) |
|----------------|-----------------------|----------------------|------------------|------------------------------------|-----------------------------------|
| 2020-06-29     | HES-01A               | Built-up Roofing     | Throughout Roof  | See Diagram - C Wing roof          |                                   |
| 2020-06-29     | HES-01B               | Built-up Roofing     | Throughout Roof  | See Diagram - C Wing roof          |                                   |
| 2020-06-29     | HES-01C               | Built-up Roofing     | Throughout Roof  | See Diagram - play cover           |                                   |
| 2020-06-29     | HES-01D               | Built-up Roofing     | Throughout Roof  | See Diagram - Gym Roof             |                                   |
| 2020-06-29     | HES-01E               | Built-up Roofing     | Throughout Roof  | See Diagram - Hall/ Cafeteria Roof |                                   |
| 2020-06-29     | HES-01F               | Built-up Roofing     | Throughout Roof  | See Diagram - Cafeteria            |                                   |
| 2020-06-29     | HES-01G               | Built-up Roofing     | Throughout Roof  | See Diagram - B rooms              |                                   |
| 2020-06-29     | HES-01H               | Built-up Roofing     | Throughout Roof  | See Diagram - A wing roof          |                                   |

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| Date Collected | Sample Identification | Material Description            | Homogeneous Area                                           | Sample Location                           | Lab Identification (Lab Use Only) |
|----------------|-----------------------|---------------------------------|------------------------------------------------------------|-------------------------------------------|-----------------------------------|
| 2020-06-29     | HES-01I               | Built-up Roofing                | Throughout Roof                                            | See Diagram - A Wing Roof                 |                                   |
| 2020-06-29     | HES-02A               | Gray Roof Caulking              |                                                            | See Diagram - A Roof vent                 |                                   |
| 2020-06-29     | HES-02B               | Gray Roof Caulking              |                                                            | See Diagram - Cafeteria roof unit         |                                   |
| 2020-06-29     | HES-02C               | Gray Roof Caulking              |                                                            | See Diagram - Roof                        |                                   |
| 2020-06-29     | HES-03A               | Roofing Felt Paper              | Roof                                                       | See Diagram- Roof                         |                                   |
| 2020-06-29     | HES-03B               | Roofing Felt Paper              | Roof                                                       | See Diagram                               |                                   |
| 2020-06-29     | HES-03C               | Roofing Felt Paper              | Roof                                                       | See Diagram - Roof                        |                                   |
| 2020-06-29     | HES-04A               | Black Roof Caulking             | Roofing At Edge of TPO roofing                             | See Diagram - Roof edge                   |                                   |
| 2020-06-29     | HES-04B               | Black Roof Caulking             | Roofing At Edge of TPO roofing                             | See Diagram - Roof Edge                   |                                   |
| 2020-06-29     | HES-04C               | Black Roof Caulking             | Roofing At Edge of TPO roofing                             | See Diagram - Roof Edge                   |                                   |
| 2020-06-29     | HES-05A               | Gray Roofing Mastic             | Roof Edge at TPO ROOFING                                   | See Diagram- Roof Edge                    |                                   |
| 2020-06-29     | HES-05B               | Gray Roofing Mastic             | Roof Edge at TPO ROOFING                                   | See Diagram-Roof Edge                     |                                   |
| 2020-06-29     | HES-05C               | Gray Roofing Mastic             | Roof Edge at TPO ROOFING                                   | See Diagram Roof Edge                     |                                   |
| 2020-06-29     | HES-06A               | HVAC Duct Tape                  | A wing Mechanical Mezzanine , Various HVAC duct components | See Diagram - A Wing Mechanical Mezzanine |                                   |
| 2020-06-29     | HES-06B               | HVAC Duct Tape                  | A wing Mechanical Mezzanine , Various HVAC duct components | See Diagram - A wing mechanical mezzanine |                                   |
| 2020-06-29     | HES-06C               | HVAC Duct Tape                  | A wing Mechanical Mezzanine , Various HVAC duct components | See Diagram - Hallway Outside Storage B2  |                                   |
| 2020-06-29     | HES-07A               | Gray HVAC Caulking              | A Wing Mechanical Mezzanine                                | See Diagram - A Wing Mechanical mezzanine |                                   |
| 2020-06-29     | HES-07B               | Gray HVAC Caulking              | A Wing Mechanical Mezzanine                                | See Diagram - A Wing Mechanical Mezzanine |                                   |
| 2020-06-29     | HES-07C               | Gray HVAC Caulking              | A Wing Mechanical Mezzanine                                | See Diagram - A-wing mechanical mezzanine |                                   |
| 2020-06-29     | HES-08A               | Gypsum Board and Joint Compound | Throughout A Wing                                          | See Diagram - A wing Mechanical Mezzanine |                                   |

| Date Collected | Sample Identification | Material Description                                    | Homogeneous Area                                        | Sample Location                           | Lab Identification (Lab Use Only) |
|----------------|-----------------------|---------------------------------------------------------|---------------------------------------------------------|-------------------------------------------|-----------------------------------|
| 2020-06-29     | HES-08B               | Gypsum Board and Joint Compound                         | Throughout A Wing                                       | See Diagram- A Wing outside room A102     |                                   |
| 2020-06-29     | HES-08C               | Gypsum Board and Joint Compound                         | Throughout A Wing                                       | See Diagram - Room A112                   |                                   |
| 2020-06-29     | HES-09A               | Gypsum Board and Joint Compound                         | Throughout C Wing                                       | See Diagram - C Wing Mechanical Mezzanine |                                   |
| 2020-06-29     | HES-09B               | Gypsum Board and Joint Compound                         | Throughout C Wing                                       | See Diagram - C120                        |                                   |
| 2020-06-29     | HES-09C               | Gypsum Board and Joint Compound                         | Throughout C Wing                                       | See Diagram - C106                        |                                   |
| 2020-06-29     | HES-10A               | Hard Fitting                                            | C Wing Mechanical Mezzanine, Throughout Plumbing System | See Diagram - C Wing Mechanical Mezzanine |                                   |
| 2020-06-29     | HES-10B               | Hard Fitting                                            | C Wing Mechanical Mezzanine, Throughout Plumbing System | See Diagram - C Wing Mechanical Mezzanine |                                   |
| 2020-06-29     | HES-10C               | Hard Fitting                                            | C Wing Mechanical Mezzanine, Throughout Plumbing System | See Diagram - C106                        |                                   |
| 2020-06-29     | HES-11A               | 2' x 4' Drop-in Ceiling Tile with fissures and Pinholes | Throughout C Wing                                       | See Diagram - C Wing                      |                                   |
| 2020-06-29     | HES-11B               | 2' x 4' Drop-in Ceiling Tile with fissures and Pinholes | Throughout C Wing                                       | See Diagram - C112                        |                                   |
| 2020-06-29     | HES-11C               | 2' x 4' Drop-in Ceiling Tile with fissures and Pinholes | Throughout C Wing                                       | See Diagram - Room C106                   |                                   |
| 2020-06-29     | HES-12A               | Gray HVAC Duct Mastic                                   | HVAC ducts throughout                                   | See Diagram - C wing                      |                                   |
| 2020-06-29     | HES-12B               | Gray HVAC Duct Mastic                                   | HVAC ducts throughout                                   | See Diagram - Library                     |                                   |
| 2020-06-29     | HES-12C               | Gray HVAC Duct Mastic                                   | HVAC ducts throughout                                   | See Diagram - Library                     |                                   |
| 2020-06-29     | HES-13A               | Black Mastic                                            | Above ceiling appears to be from roofing                | See Diagram - C106                        |                                   |
| 2020-06-29     | HES-13B               | Black Mastic                                            | Above ceiling appears to be from roofing                | See Diagram                               |                                   |
| 2020-06-29     | HES-13C               | Black Mastic                                            | Above ceiling appears to be from roofing                | See Diagram                               |                                   |

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| Date Collected                     | Sample Identification | Material Description                                         | Homogeneous Area  | Sample Location                       | Lab Identification (Lab Use Only) |
|------------------------------------|-----------------------|--------------------------------------------------------------|-------------------|---------------------------------------|-----------------------------------|
| 46<br>2020-06-29                   | HES-14A               | 2' x 4' Drop-in Ceiling Tile, Pinholes                       | Throughout B Wing | See Diagram - Main Corridor           |                                   |
| 47<br>2020-06-29                   | HES-14B               | 2' x 4' Drop-in Ceiling Tile, Pinholes                       | Throughout B Wing | See Diagram - Cafeteria               |                                   |
| 48<br>2020-06-29                   | HES-14C               | 2' x 4' Drop-in Ceiling Tile, Pinholes                       | Throughout B Wing | See Diagram - Main Corridor           |                                   |
| 49<br>2020-06-29                   | HES-15A               | Gypsum Board and Joint Compound                              | Throughout B Wing | See Diagram - Cafeteria               |                                   |
| 50<br>2020-06-29                   | HES-15B               | Gypsum Board and Joint Compound                              | Throughout B Wing | See Diagram - Stage                   |                                   |
| 51<br>2020-06-29                   | HES-15C               | Gypsum Board and Joint Compound                              | Throughout B Wing | See Diagram - Hall outside storage B2 |                                   |
| 52<br>2020-06-29                   | HES-16A               | 2' x 4' Drop-in Ceiling Tile with Long Fissures and Pinholes | Throughout A Wing | See Diagram - A Wing                  |                                   |
| 53<br>2020-06-29                   | HES-16B               | 2' x 4' Drop-in Ceiling Tile with Long Fissures and Pinholes | Throughout A Wing | See Diagram - A112                    |                                   |
| 54<br>2020-06-29                   | HES-16C               | 2' x 4' Drop-in Ceiling Tile with Long Fissures and Pinholes | Throughout A Wing | See Diagram - A116                    |                                   |
| 55<br>2020-06-29                   | HES-17A               | 1'x1' Ceiling Tile and Glue                                  | Gym, Stage        | See Diagram- Gym                      |                                   |
| 56<br>2020-06-29                   | HES-17B               | 1'x1' Ceiling Tile and Glue                                  | Gym, Stage        | See Diagram - Gym                     |                                   |
| 57<br>2020-06-29                   | HES-17C               | 1'x1' Ceiling Tile and Glue                                  | Gym, Stage        | See Diagram - Stage                   |                                   |
| Special Instruction to Laboratory: |                       |                                                              |                   |                                       |                                   |
| N/A                                |                       |                                                              |                   |                                       |                                   |

# CHAIN OF CUSTODY INFORMATION

| Relinquished By:          | Date       | Time         | Received By:             | Date   | Time |
|---------------------------|------------|--------------|--------------------------|--------|------|
| I. (Print): Matt Cuda     | 2020-06-30 | 13:45:52 PDT | I. (Print): <i>Donne</i> | 7/1/20 |      |
| (Sign): <i>Matt Cuda</i>  |            |              | (Sign): <i>Donne</i>     |        |      |
| II. (Print): <i>Donne</i> | 7/1/20     |              | II. (Print):             |        |      |
| (Sign): <i>Donne</i>      |            |              | (Sign):                  |        |      |



## **Appendix C – Prior Documentation**

## ASBESTOS MATERIALS

The following materials either tested positive or are presumed to be asbestos-containing. Materials that had mixed results are considered positive. Materials not sampled or not listed in this report may contain asbestos and should be tested to verify asbestos content prior to impact, demolition, renovation, etc.

(+) Tested Positive, (M) Mixed Results, (P) Presumed Positive

| Hiteon (HIT) |                                                                                                                                                                                                               |                                     |          |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------|
| Result       | Material                                                                                                                                                                                                      | Location                            | Quantity |
| P            | MJP Pipe Fittings cmnt: One hard fitting by main hall roof access ragged, patched with duct tape. Continue to monitor - 2018 / [ID: 24749]                                                                    | Attic                               | 10 ea    |
| M            | Gypsum Wallboard/Joint Compound / Mixed Results, Cmmt: Tested <1% Chrysotile (19766.008-0008, -0009, -0010 phase 6) [ID: 27010]                                                                               | Attic / Cafeteria                   | 999 nq   |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / C300 Commons), Cmmt: Carpeted [ID: 24848]                                                                    | Level 1 / A Commons                 | 150 sf   |
| P            | Floor Tile and Mastic / Visible-Positive / 12x12 / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / C316), Cmmt: Encapsulated with white 12 x 12 tile during summer 2000. [ID: 24856]                      | Level 1 / A Hall Staff Room         | 330 sf   |
| P            | Floor Tile and Mastic / 12x12 / / , Cmmt: 120 SF visible in storage room. [ID: 27794]                                                                                                                         | Level 1 / A Hall Staff Room Storage | 120 sf   |
| P            | Sheet Flooring Material and Mastic / PACM / / , (Old Room: Main Building / Level 1 / C308), Cmmt: 24 sq.ft. visible in restroom, remainder encapsulated with white 12x12 tile during Summer 2000. [ID: 24852] | Level 1 / A100                      | 191 sf   |
| P            | Sheet Flooring Material and Mastic / PACM / / , (Old Room: Main Building / Level 1 / C310), Cmmt: 24 sq.ft. visible in restroom, remainder encapsulated with white 12x12 tile during Summer 2000. [ID: 24853] | Level 1 / A102                      | 188 sf   |
| M            | Gypsum Wallboard/Joint Compound / Mixed Results, (Old Room: Main Building / Level 1 / C303), Cmmt: Non-Detect (19766.008-0025 phase 4) [ID: 26996]                                                            | Level 1 / A103 Restroom             | 999 nq   |
| P            | Sheet Flooring Material and Mastic / PACM / / , (Old Room: Main Building / Level 1 / C312), Cmmt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24854]                                        | Level 1 / A104                      | 160 sf   |

| Hiteon (HIT) |                                                                                                                                                                       |                                                                         |          |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------|
| Result       | Material                                                                                                                                                              | Location                                                                | Quantity |
| P            | Sheet Flooring Material and Mastic / PACM / /, (Old Room: Main Building / Level 1 / C314), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24855] | Level 1 / A106                                                          | 200 sf   |
| P            | Sheet Flooring Material and Mastic / PACM / /, (Old Room: Main Building / Level 1 / C318), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24857] | Level 1 / A108                                                          | 258 sf   |
| P            | Sheet Flooring Material and Mastic / PACM / /, (Old Room: Main Building / Level 1 / C320), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24858] | Level 1 / A110                                                          | 180 sf   |
| P            | Sheet Flooring Material and Mastic / PACM / /, (Old Room: Main Building / Level 1 / C322), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24859] | Level 1 / A112                                                          | 170 sf   |
| M            | Gypsum Wallboard/Joint Compound / Mixed Results, Cmnt: Tested <1% Chrysotile (19766.008-0014 phase 4); Abated Summer 2008. [ID: 26986]                                | Level 1 / A112 - Reconfigured Summer 2008, now part of Library and hall | 999 nq   |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmnt: Abated 685 SF - Summer 2008 [ID: 24835]                                                     | Level 1 / A112 - Reconfigured Summer 2008, now part of Library and hall | 0 sf     |
| +            | Floor Tile and Mastic / Tested Positive, Cmnt: Tested 5% and 4% Chrysotile (19766.008-0034 phase 4) [ID: 27005]                                                       | Level 1 / A112 - Reconfigured Summer 2008, now part of Library and hall | 999 nq   |
| P            | Sheet Flooring Material and Mastic / PACM / /, (Old Room: Main Building / Level 1 / C324), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24860] | Level 1 / A114                                                          | 135 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, Cmnt: Abated 141 SF - Summer 2008 [ID: 24836]                                                              | Level 1 / A114 - Reconfigured Summer 2008, now part of Library and hall | 0 sf     |
| +            | Black Sink Undercoating / Tested Positive, Cmnt: Tested 4% Chrysotile (19766.008-0012 phase 4); Abated Summer 2008. [ID: 26984]                                       | Level 1 / A114 - Reconfigured Summer 2008, now part of Library and hall | 0 ea     |
| +            | Floor Tile and Mastic / Tested Positive, Cmnt: Tested <1% Chrysotile (19766.008-0010 phase 4); Abated Summer 2008. [ID: 26982]                                        | Level 1 / A114 - Reconfigured Summer 2008, now part of Library and hall | 0 sf     |
| P            | Sheet Flooring Material and Mastic / PACM / /, (Old Room: Main Building / Level 1 / C326), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24861] | Level 1 / A116                                                          | 165 sf   |

| Hiteon (HIT) |                                                                                                                                                                                                                |                         |          |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------|
| Result       | Material                                                                                                                                                                                                       | Location                | Quantity |
| P            | Sheet Flooring Material and Mastic / PACM / /, (Old Room: Main Building / Level 1 / C328), Cmmt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24862]                                          | Level 1 / A118          | 175 sf   |
| +            | Floor Tile and Mastic / Beige and Yellow/Tan / 12x12 / Tested Positive, Cmmt: 3% Chrysotile - Beige Tile (0017148-005, 007) Mastic Tested Negative. 12/14 Inspection-Cracked, loose tiles at B100. [ID: 29170] | Level 1 / B Hall        | 999 nq   |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / West Corridor), Cmmt: Abated 447 SF- June 2006 [ID: 24881]                                            | Level 1 / B Hall / West | 0 sf     |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / B200), Cmmt: Carpeted [ID: 24844]                                                                             | Level 1 / B100          | 860 sf   |
| P            | Boiler Insulation / / / HSA 1, Cmmt: new boiler 2008 [ID: 24846]                                                                                                                                               | Level 1 / Boiler        | 0 sf     |
| P            | MJP Pipe Fittings /, Cmmt: 1 fitting removed Fall 2007 [ID: 24847]                                                                                                                                             | Level 1 / Boiler        | 14 ea    |
| +            | Gypsum Wallboard/Joint Compound / Tested Positive, Cmmt: Tested <1% Chrysotile; Abated 9 SF - April 2009 [ID: 28161]                                                                                           | Level 1 / Boiler Room   | 1030 sf  |
| +            | Expansion Tank Insulation / Tested Positive, Cmmt: (19766.008-0028 phase 4); Abated Summer 2008. [ID: 26999]                                                                                                   | Level 1 / Boiler Room   | 0 sf     |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A100), Cmmt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24751]                              | Level 1 / C100          | 144 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A102), Cmmt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24752]                              | Level 1 / C102          | 143 sf   |
| P            | Covebase/Mastic / Cmmt: Abated all grey cove base/mastic May 2019                                                                                                                                              | Level 1 / C104          | 0        |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A104), Cmmt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24753]                              | Level 1 / C104          | 203 sf   |

| Hiteon (HIT) |                                                                                                                                                                                   |                |          |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------|
| Result       | Material                                                                                                                                                                          | Location       | Quantity |
| P            | Covebase/Mastic / Cmnt: Abated all grey cove base/mastic May 2019                                                                                                                 | Level 1 / C106 | 0        |
| +            | Chalk Board Mastic / Tan / Tested Positive, (Old Room: Main Building / Level 1 / A106), Cmnt: 5% Chrysotile / behind new whiteboard. [ID: 26103]                                  | Level 1 / C106 | 999 nq   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A106), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24754] | Level 1 / C106 | 204 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A108), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24833] | Level 1 / C108 | 138 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A110), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24834] | Level 1 / C110 | 148 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A116), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24837] | Level 1 / C112 | 140 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A118), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24838] | Level 1 / C114 | 152 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A120), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24839] | Level 1 / C116 | 160 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A122), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24840] | Level 1 / C118 | 130 sf   |
| P            | Sheet Flooring Material and Mastic / Non-Visible PACM / /, (Old Room: Main Building / Level 1 / A124), Cmnt: Encapsulated with white 12 x 12 tile during Summer 2000. [ID: 24841] | Level 1 / C120 | 130 sf   |

| Hiteon (HIT) |                                                                                                                                                                                                 |                                                  |          |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------|
| Result       | Material                                                                                                                                                                                        | Location                                         | Quantity |
| M            | Cove Base and Mastic / Mixed Results, Cmmt: Tested <1% Chrysotile (19766.008-0021 phase 4); Abated Summer 2008. [ID: 26993]                                                                     | Level 1 / Cafeteria                              | 0 sf     |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmmt: Abated 2045 SF Summer 2008 & Winter 2008. [ID: 24863]                                                                 | Level 1 / Cafeteria                              | 0 sf     |
| +            | Floor Tile and Mastic / Tested Positive, Cmmt: Tested 3% and 3% Chrysotile (19766.008-0023 phase 4); Abated Summer 2008. [ID: 26994]                                                            | Level 1 / Cafeteria                              | 0 sf     |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / B202), Cmmt: Abated Dec. 2008 [ID: 24845]                                                      | Level 1 / Conference Rm                          | 0 sf     |
| P            | Transite Panel / / / HSA 55 [ID: 24864]                                                                                                                                                         | Level 1 / Custodial Office                       | 40 sf    |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmmt: Some gouging noted at 12/13 inspection. Cracking at doorway noted 6/14 inspection. Broken tile at stage noted 12/14 i | Level 1 / Gym                                    | 4259 sf  |
| +            | Gypsum Wallboard/Joint Compd.                                                                                                                                                                   | Level 1 / Gym / Right of stage / under paneling  | 999      |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmmt: Minor cracking at entrance. [ID: 24866]                                                                               | Level 1 / Gym Office                             | 95 sf    |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmmt: Minor cracking across from A 128 noted by inspector. [ID: 24750]                                                      | Level 1 / Hall                                   | 311 sf   |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / Restroom Unisex 1), Cmmt: Abated Summer 2008 [ID: 24873]                               | Level 1 / Health Restroom                        | 0 sf     |
| +            | Gypsum Wallboard/Joint Compound / Mixed Results, Cmmt: (19766.008-0020 phase 4); Abated Summer 2008. [ID: 26992]                                                                                | Level 1 / Health Room - Reconfigured Summer 2008 | 0 sf     |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmmt: Abated 172 SF - Summer 2008 [ID: 24867]                                                                               | Level 1 / Health Room - Reconfigured Summer 2008 | 0 sf     |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmmt: Abated 59 SF - Summer 2005 [ID: 24868]                                                                                | Level 1 / Kitchen                                | 0 sf     |

| Hiteon (HIT) |                                                                                                                                                     |                                                  |          |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------|
| Result       | Material                                                                                                                                            | Location                                         | Quantity |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99 [ID: 24869]                                                                      | Level 1 / Kitchen Storage                        | 180 sf   |
| +            | Gypsum Wallboard/Joint Compound / Tested Positive, Cmnt: Tested 2% Chrysotile (19766.008-0003 phase 10); Abated 120 SF - December 2008. [ID: 27954] | Level 1 / Locker Room Boys (Boys 2)              | 412 sf   |
| +            | Gypsum Wallboard/Joint Compound / Tested Positive, Cmnt: Tested 2% Chrysotile (19766.008-0006 phase 10); Abated 120 SF - December 2008. [ID: 27956] | Level 1 / Locker Room Girls (Girls 2)            | 416 sf   |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmnt: Abated 12 SF - November 2004 / Abated 440 SF- Summer 2006 [ID: 24870]     | Level 1 / Main Corridor                          | 810 sf   |
| +            | Window Glazing Compound / Tested Positive, Cmnt: Abated 120 SF - Summer 2008 [ID: 27542]                                                            | Level 1 / Main Entrance                          | 0 ea     |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, Cmnt: Abated 375 SF - Summer 2008 [ID: 24871]                                           | Level 1 / Main Office - Reconfigured Summer 2008 | 0 sf     |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / C302), Cmnt: Carpeted [ID: 24849]                  | Level 1 / Office A2                              | 143 sf   |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / C304), Cmnt: Carpeted [ID: 24850]                  | Level 1 / Office A3                              | 146 sf   |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / C306), Cmnt: Carpeted [ID: 24851]                  | Level 1 / Office A4                              | 146 sf   |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / A126), Cmnt: Carpeted [ID: 24842]                  | Level 1 / Office C1                              | 187 sf   |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / A128), Cmnt: Carpeted [ID: 24843]                  | Level 1 / Office C2                              | 216 sf   |
| P            | Floor Tile and Mastic / Non-Visible PACM / / HSA 4,9,98,99, Cmnt: Abated 283 SF - Summer 2008 [ID: 24872]                                           | Level 1 / Principal - Reconfigured Summer 2008   | 0 sf     |

| Hiteon (HIT) |                                                                                                                                                    |                                                                                       |          |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------|
| Result       | Material                                                                                                                                           | Location                                                                              | Quantity |
| P            | Sheet Flooring Material and Mastic / PACM / / [ID: 24875]                                                                                          | Level 1 / Restroom Unisex 3                                                           | 37 sf    |
| P            | Sheet Flooring Material and Mastic / PACM / / , Cmnt: Cracked across entryway and behind toilet. [ID: 24876]                                       | Level 1 / Restroom Unisex 4                                                           | 19 sf    |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmnt: Abated 359 SF - Summer 2008 [ID: 24877]                                  | Level 1 / Staff - Reconfigured Summer 2008                                            | 0 sf     |
| +            | Window Glazing / Tested Positive, Cmnt: 19766.008-0016 phase 4); Abated 100 SF - Summer 2008. [ID: 26988]                                          | Level 1 / Staff Room - Reconfigured Summer 2008                                       | 0 lf     |
| M            | Gypsum Wallboard/Joint Compound / Mixed Results, Cmnt: Tested <1% Chrysotile (19766.008-0032 phase 4) [ID: 27003]                                  | Level 1 / Staff Room - Reconfigured Summer 2008                                       | 0 sf     |
| P            | Asbestos Insulated Wiring                                                                                                                          | Level 1 / Stage / White Cloth Wiring From Ceiling outlets to lights at front of stage | 4 ea     |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99 [ID: 24878]                                                                     | Level 1 / Storage 2                                                                   | 175 sf   |
| P            | MJP Pipe Fittings / [ID: 24880]                                                                                                                    | Level 1 / Storage 4                                                                   | 4 ea     |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmnt: One damaged tile on hallway side of door noted by inspector. [ID: 24879] | Level 1 / Storage 4                                                                   | 123 sf   |
| +            | Pink Sink Undercoating / Tested Positive, Cmnt: 19766.008-0019 phase 4); Abated Summer 2008. [ID: 26991]                                           | Level 1 / Work Room - Reconfigured Summer 2008                                        | 0 ea     |
| P            | Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, Cmnt: Abated 273 SF Summer 2008 [ID: 24882]                                    | Level 1 / Work Room - Reconfigured Summer 2008                                        | 0 sf     |
| +            | Floor Tile and Mastic / Tested Positive, Cmnt: Tested 2% and 10% Chrysotile (19766.008-0029 phase 4); Abated Summer 2008. [ID: 27000]              | Level 1 / Work Room - Reconfigured Summer 2008                                        | 0 sf     |
| +            | Hard Fittings / Tested Positive, Cmnt: 11 fittings removed Nov. 2007 [ID: 26208]                                                                   | Level 2 / Cafeteria Mezzanine Mechanical Rm                                           | 0 ea     |
| +            | Transite Panels / Tested Positive, Cmnt: Abated 140 SF- July 2004 [ID: 25980]                                                                      | Roof                                                                                  | 0 sf     |

## MATERIALS THAT TESTED NEGATIVE

The following materials tested negative. Although no asbestos was detected, it is possible that further sampling could indicate asbestos content. It may be prudent to test prior to impact, demolition, renovation, etc.



| Hiteon (HIT)                                                                                                                                                    |                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Material                                                                                                                                                        | Location                                                                |
| Duct Felt Tape                                                                                                                                                  | A wing; penthouse, thin white duct tape                                 |
| Mechanical Isolation Cloth / Tested Negative, Cmnt: Non-Detect (19766.008-0011 phase 6) [ID: 27011]                                                             | Attic / Cafeteria                                                       |
| Floor Tile and Mastic / Light Gray and Yellow/Tan / 12x12 / Tested Negative, Cmnt: Non Detect (0017148-003, 001) [ID: 29168]                                    | Level 1 / A 100                                                         |
| Sheet Flooring Material / Pebble Pattern and Gray / Tested Negative, Cmnt: Non Detect (0017148-001,002) [ID: 29169]                                             | Level 1 / A 100                                                         |
| Chalk Board Mastic / Brown / Tested Negative, (Old Room: Main Building / Level 1 / C308), Cmnt: Non-Detect [ID: 26101]                                          | Level 1 / A100                                                          |
| Lay-in Ceiling Tile / Tested Negative, (Old Room: Main Building / Level 1 / C303), Cmnt: Non-Detect (19766.008-0024 phase 4) [ID: 26995]                        | Level 1 / A103 Restroom                                                 |
| Duct Felt Tape / Tested Negative, (Old Room: Main Building / Level 1 / C303), Cmnt: Non-Detect (19766.008-0026 phase 4) [ID: 26997]                             | Level 1 / A103 Restroom                                                 |
| Chalk Board Mastic / Brown / Tested Negative, (Old Room: Main Building / Level 1 / C312), Cmnt: Non-Detect [ID: 26099]                                          | Level 1 / A104                                                          |
| Chalk Board Mastic / Yellow with Foil / Tested Negative, (Old Room: Main Building / Level 1 / C318), Cmnt: Non-Detect [ID: 26100]                               | Level 1 / A108                                                          |
| MJP Pipe Fittings / Tested Negative, Cmnt: Non-Detect (19766.008-0033 phase 4) [ID: 27004]                                                                      | Level 1 / A112 - Reconfigured Summer 2008, now part of Library and hall |
| Cove Base and Mastic / Tested Negative, Cmnt: Non-Detect (19766.008-0011 phase 4) [ID: 26983]                                                                   | Level 1 / A114 - Reconfigured Summer 2008, now part of Library and hall |
| Floor Tile and Mastic / Light Gray and Yellow/Tan / 12x12 / Tested Negative, Cmnt: Non-Detect (00117148-004,006) [ID: 29171]                                    | Level 1 / B Hall                                                        |
| Lay-in Ceiling Tile / Tested Negative, (Old Room: Main Building / Level 1 / West Corridor), Cmnt: Non-Detect (19766.008-0004, -0005, -0006 phase 4) [ID: 26980] | Level 1 / B Hall / West                                                 |
| Lay-in Ceiling Tile / Tested Negative, (Old Room: Main Building / Level 1 / A Hall), Cmnt: Non-Detect (19766.008-0007, -0008, -0009 phase 4) [ID: 26981]        | Level 1 / B Hall Main Building / Main Corridor                          |
| Hard Fitting / Gray / Tested Negative, Cmnt: Non-Detect (0014473-001 HES-01 Layer 1 and 2) [ID: 28833]                                                          | Level 1 / Boiler Room                                                   |

| Hiteon (HIT)                                                                                                                                                                                             |                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Material                                                                                                                                                                                                 | Location                              |
| Exterior Boiler Insulation / Tested Negative, Cmnt: Non-Detect (19766.008-0005, -0006, -0007 phase 6) [ID: 27009]                                                                                        | Level 1 / Boiler Room                 |
| Interior Boiler Insulation / Tested Negative, Cmnt: Non-Detect (19766.008-0002, -0003, -0004 phase 6) [ID: 27008]                                                                                        | Level 1 / Boiler Room                 |
| Boiler Door Gasket / Tested Negative, Cmnt: Non-Detect (19766.008-0001 phase 6) [ID: 27007]                                                                                                              | Level 1 / Boiler Room                 |
| Chalk Board Mastic / Compressed Fibers / Tan / Tested Negative, (Old Room: Main Building / Level 1 / A106), Cmnt: Non-Detect [ID: 26102]                                                                 | Level 1 / C106                        |
| New construction summer 2008- Asbestos Free [ID: 27809]                                                                                                                                                  | Level 1 / D Hall (All rooms)          |
| Off White Debris / Tested Negative, Cmnt: Non-Detect (H-01 0018116-001) Off White debris on stairs 06/05/14 [ID: 29197]                                                                                  | Level 1 / Gym Storage                 |
| Ceramic Tile and Grout / Tested Negative, Cmnt: Non-Detect (19766.008-0030 phase 4) [ID: 27001]                                                                                                          | Level 1 / Kitchen                     |
| Floor Tile and Mastic / Visible-Positive / 12 x 12 / HSA 4,9,98,99, (Old Room: Main Building / Level 1 / Restroom Unisex 2), Cmnt: Covered by new sheet flooring winter 08-09. [ID: 24874]/ Abated 11/06 | Level 1 / Kitchen Restroom            |
| Lay-in Ceiling Tile / Tested Negative, Cmnt: Non-Detect (19766.008-0013 phase 4) [ID: 26985]                                                                                                             | Level 1 / Library                     |
| Carpet Mastic and Leveling Compound / Tested Negative, Cmnt: Non-Detect (19766.008-0015 phase 4) [ID: 26987]                                                                                             | Level 1 / Library                     |
| Ceramic Tile/Grout / Tested Negative, Cmnt: Non-Detect (19766.008-0001 phase 10) [ID: 27952]                                                                                                             | Level 1 / Locker Room Boys (Boys 2)   |
| Wall and Ceiling Plaster / Tested Negative, Cmnt: Non-Detect (19766.008-0002 phase 10) [ID: 27953]                                                                                                       | Level 1 / Locker Room Boys (Boys 2)   |
| Ceramic Tile/Grout / Tested Negative, Cmnt: Non-Detect (19766.008-0004, -0005 phase 10) [ID: 27955]                                                                                                      | Level 1 / Locker Room Girls (Girls 2) |
| Wall and Ceiling Plaster / Tested Negative, Cmnt: Non-Detect (19766.008-0007 phase 10) [ID: 27957]                                                                                                       | Level 1 / Locker Room Girls (Girls 2) |
| Glued-on Ceiling Tiles / Tested Negative, Cmnt: Non-Detect (19766.008-0001, -0002, -0003 phase 4) [ID: 26979]                                                                                            | Level 1 / Main Corridor               |
| Brick Mortar / Tested Negative, Cmnt: Non-Detect (19766.008-0017 phase 4) [ID: 26989]                                                                                                                    | Level 1 / Main Entrance               |

| Hiteon (HIT)                                                                                                                                       |                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Material                                                                                                                                           | Location                                        |
| MJP Pipe Fittings / Tested Negative, Cmnt: Non-Detect (19766.008-0035, -0036 phase 4) [ID: 27006]                                                  | Level 1 / Main Entrance                         |
| New construction summer 2008- Asbestos Free [ID: 27805]                                                                                            | Level 1 / Main Office                           |
| New construction summer 2008- Asbestos Free [ID: 27806]                                                                                            | Level 1 / Office B1                             |
| New construction summer 2008- Asbestos Free [ID: 27807]                                                                                            | Level 1 / Office B2                             |
| New construction summer 2008- Asbestos Free [ID: 27808]                                                                                            | Level 1 / Office B3                             |
| Sheet Flooring and Mastic / Tan / Tested Negative, Cmnt: Non-Detect (HES -02 1324313A, HES -02 1324314B) [ID: 28838]                               | Level 1 / Restroom 4                            |
| Sheet Flooring and Mastic / Tan / Tested Negative, Cmnt: Non-Detect (HES -03 1324314A, HES -03 1324314B) [ID: 28839]                               | Level 1 / Restroom 4                            |
| Grey Sink Undercoating / Tested Negative, Cmnt: Non-Detect (19766.008-0018 phase 4) [ID: 26990]                                                    | Level 1 / Staff Room - Reconfigured Summer 2008 |
| MJP Pipe Fittings / Tested Negative, Cmnt: Non-Detect (19766.008-031 phase 4) [ID: 27002]                                                          | Level 1 / Storage 4                             |
| Door Insulation / Off White / Tested Negative, Cmnt: Non-Detect (0017861-001) Doors between West B and A Wing [ID: 28819]                          | Level 1 / West B Hall / A Wing Doors            |
| Carpet Mastic / Tested Negative, Cmnt: Non-Detect (19766.008-0027 phase 4) [ID: 26998]                                                             | Level 1 / Work Room - Reconfigured Summer 2008  |
| Hard Fitting on Fiberglass Insulated Line / Fibrous Powder / Tan / Tested Negative, Cmnt: non-detect (19766.008-0001 - 0006 phase 100) [ID: 28218] | Level 2 / Cafeteria Mech Loft                   |

## ASBESTOS SUMMARY

The following shows asbestos activities and projects. For more detailed information or related documents see the individual activity information in the database.

June 2003 to September 2003 - HIT2019-2  
Activity: Inspection/Survey - Location: HIT

January 2004 to December 2012 -  
Activity: Database Update - Location: HIT

HIT Import Historical Materials without samples

January 2004 to December 2012 - 19766.008 p04  
Activity: Database Update - Location: HIT p04

HIT Import Historical materials with Samples

January 2004 to December 2012 - 19766.008 p06  
Activity: Database Update - Location: HIT p06

HIT Import Historical materials with Samples

January 2004 to December 2012 - 19766.008 p10  
Activity: Database Update - Location: HIT p10

HIT Import Historical materials with Samples

January 2004 to December 2012 - 19766.017 p100  
Activity: Database Update - Location: HIT p100

HIT Import Historical materials with Samples

October 2006 to November 2006 - HIT2019-3  
Activity: Major Abatement - Location: HIT

Example example example

April 2016 to April 2016 - HITsampling1  
Activity: Sampling - Location: Level 1 / gym

February 2017 to February 2017 - PBS23816.133  
Activity: Renovation/Repair/Painting - Location: Attic Space adjacent to kitchen & roof penhouse

Abatement Company PAS

Daily Log x

DEQ Notification

Disposal Manifest

TEM Air Clearance Samples n/a

Floor Plan x

Area Abated Entered Into Database

Asbestos Abatement Contractor Invoice Received x

Asbestos Abatement Consultant Invoice Received x

Asbestos Abatement Consultant Close Out Documentation Received x

May 2017 to May 2017 - HITabatement2  
Activity: O & M - Location: Level 1 / gym

x Floor Plan

x Daily Log  
x Contractor Invoice

DEQ Notification

Disposal Manifest

n/a Air clearance samples

x Consultant Close out documentation in Verdant

x Consultant Invoice

April 2018 to April 2018 - 1  
Activity: Reinspection - Location: Hiteon

#### REINSPECTION SUMMARY

The 2018 Asbestos Hazard Emergency Response Act (AHERA) 3-Year Asbestos Reinspection for Hiteon Elementary School was completed on April 5, 2018, in accordance with the requirements of 40 CFR, Part 763, Asbestos-Containing Materials in Schools; Final Rule and Notice.

May 2019 to May 2019 - HIT2019-1  
Activity: O & M - Location: C104/C016

Floor Plan X

Daily Log x

Contractor Invoice x

DEQ Notification x

Disposal Manifest

Air clearance samples

Consultant Close out documentation in Verdant x

Consultant Invoice x

February 2020 to February 2020 - HIT2020-1

Activity: Sampling - Location: HIT

- \_ Floor plan
- \_ Results received
- \_ Results in Verdant
- \_ Daily log
- \_ Consultant Invoice
- \_ Contractor Invoice
- \_ DEQ Notification
- \_ Disposal Manifest
- \_ Lab samples in Verdant
- \_ TEM Air clearance samples
- \_ Consultant Close out documents in Verdant
- \_ BOLI Form
- \_ Certified Payroll dates

Sampled thin duct taping in A-Wing mechanical penthouse accessible through roof access ladder. All samples negative.

## ACTIVITIES

The following shows historic activities and projects. For more detailed information or related documents see the individual activity information in the database.

| Activity Type              | Location                                        | Start Date | Related Documents |
|----------------------------|-------------------------------------------------|------------|-------------------|
| Major Abatement            | HIT                                             | 03/23/2020 | Yes               |
| Sampling                   | HIT                                             | 02/06/2020 | Yes               |
| O & M                      | C104/C016                                       | 05/08/2019 | Yes               |
| Reinspection               | Hiteon                                          | 04/05/2018 | Yes               |
| O & M                      | Level 1 / gym                                   | 05/27/2017 | Yes               |
| Renovation/Repair/Painting | Attic Space adjacent to kitchen & roof penhouse | 02/02/2017 | Yes               |
| Water Testing              | Throughout                                      | 06/25/2016 | Yes               |
| Sampling                   | Level 1 / gym                                   | 04/01/2016 | Yes               |
| Major Abatement            | HIT                                             | 10/01/2006 | Yes               |
| Database Update            | HIT                                             | 01/01/2004 | No                |
| Database Update            | HIT p04                                         | 01/01/2004 | No                |
| Database Update            | HIT p06                                         | 01/01/2004 | No                |
| Database Update            | HIT p10                                         | 01/01/2004 | No                |
| Database Update            | HIT p100                                        | 01/01/2004 | No                |
| Inspection/Survey          | HIT                                             | 06/01/2003 | Yes               |

## **Appendix D – Inspector Certification(s)**

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# ***The Environmental Institute***

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## *Matthew Cuda*

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Social Security Number - XXX-XX-8274

TRC - 4105 SE International Way - Milwaukie, OR 97222

*Has completed 4 hours of coursework and satisfactorily  
passed an examination that meets all criteria required for  
EPA/AHERA/ASHARA (TSCA Title II) Approved Reaccreditation*

### *Asbestos in Buildings: Inspector Refresher*

*January 31, 2020*

Course Date

*17792*

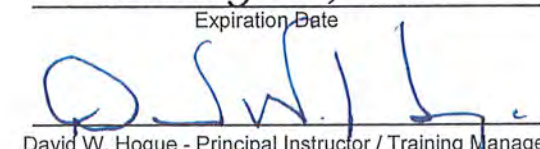
Certificate Number

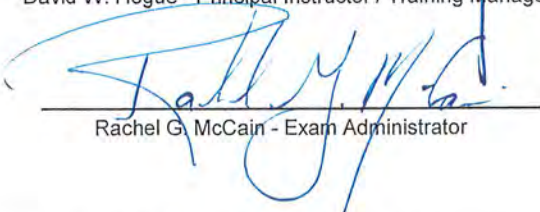
*January 31, 2020*

Examination Date

*January 30, 2021*

Expiration Date

  
David W. Hogue - Principal Instructor / Training Manager

  
Rachel G. McCain - Exam Administrator



(Approved by the ABIH Certification Maintenance Committee for 1/2 CM point - Approval #11-577)

(Florida Provider Registration Number FL49-0001342 - Course #FL49-0002805)

TEI - 1395 S. Marietta Parkway SE - Building 100, Suite 124 - Marietta, GA 30067

Phone: 770-427-3600 - Website: [www.tei-atl.com](http://www.tei-atl.com)



# Certificate of Completion

This is to certify that

**Jason Stone**

has satisfactorily completed  
4 hours of refresher training as an  
AHERA Building Inspector

to comply with the training requirements of  
TSCA Title II, 40 CFR 763 (AHERA)

EPA Provider # 1085

175978

Certificate Number



Dec 9, 2019 Expires in 1 year.

Date(s) of Training

Exam Score: N/A  
(if applicable)

A handwritten signature in black ink, likely belonging to the instructor, written over a horizontal line.

Instructor

ARGUS PACIFIC, INC. / 21905 64th AVE W, SUITE 100 / MOUNTLAKE TERRACE, WASHINGTON 98043 / 206.285.3373 / ARGUSPACIFIC.COM

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Metal ladders.
3. Miscellaneous steel trim.

### 1.2 SUBMITTALS

#### A. Product Data: For the following:

1. Paint products.

#### B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

## PART 2 - PRODUCTS

### 2.1 METALS, GENERAL

#### A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.

### 2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- C. Steel Tubing: ASTM A 500, cold-formed steel tubing.
- D. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.

### 2.3 MISCELLANEOUS MATERIALS

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

## 2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- C. 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.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.
- E. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

## 2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

## 2.6 METAL LADDERS

- A. General:
  - 1. Comply with ANSI A14.3 unless otherwise indicated.
- B. Steel Ladders:
  - 1. Space siderails 18 inches apart unless otherwise indicated.
  - 2. Siderails: Continuous, 1/2-by-2-1/2-inch steel flat bars, with eased edges.
  - 3. Rungs: 3/4-inch- diameter steel pipe.
  - 4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
  - 5. Provide nonslip abrasive surfaces on top of each rung.
  - 6. Galvanize ladders, including brackets and fasteners.

2.7 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize exterior miscellaneous steel trim.

2.8 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

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.

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.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

METAL FABRICATIONS  
PART 1 - SECTION 055000

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

3.2 ADJUSTING AND CLEANING

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

END OF SECTION 055000

## SECTION 061000 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Wood blocking, cants, and nailers.
  - 5. Wood furring.
  - 6. Wood sleepers.

#### 1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. OSB: Oriented strand board.
- E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
  - 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

Project Number: **20Y082.01**

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.

## 2.3 DIMENSION LUMBER FRAMING

A. Ceiling Joists: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WHPA.

B. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WHPA.

C. Exposed Framing Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Species and Grade: As indicated above for load-bearing construction of same type.

## 2.4 ENGINEERED WOOD PRODUCTS

A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2600 psi (17.9 MPa for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).

B. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).



- C. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055.
  - 1. Web Material: Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
  - 2. Structural Properties: Depths and design values not less than those indicated.
  - 3. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.
- D. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.
  - 1. Manufacturer: Provide products by same manufacturer as I-joists.
  - 2. Material: product made from any combination solid lumber, wood strands, and veneers.
  - 3. Thickness: as indicated.
  - 4. Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Cants.
  - 5. Furring.
- B. Dimension Lumber Items: No. 2 grade lumber of any of the following species:
  - 1. Hem-fir; WCLIB or WWPA.
  - 2. Douglas fir-larch; WCLIB or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
  - 1. Douglas fir-larch; No. 2 grade WCLIB or WWPA
  - 2. Hem-fir No. 2 grade: WCLIB, or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

**2.6 FASTENERS**

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

**2.7 METAL FRAMING ANCHORS**

- A. Allowable design loads, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  - 1. Use for wood-preservative-treated lumber and where indicated.
- D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304
  - 1. Use for exterior locations and where indicated.

**2.8 MISCELLANEOUS MATERIALS**

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

**PART 3 - EXECUTION****3.1 INSTALLATION, GENERAL**

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- D. Install metal framing anchors to comply with manufacturer's written instructions.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - 2. ICC-ES evaluation report for fastener.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
  - 1. Comply with indicated fastener patterns where applicable.

2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### 3.3 INSTALLATION OF WOOD FURRING

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring vertically at 24 inches (610 mm) o.c.

### 3.4 INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

- A. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.5 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 075423 – THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING AND RELATED SHEET METAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Induction welded mechanically attached TPO membrane roofing system.
- B. Polyiso insulation and high Density polyiso cover board.
- C. Sheet Metal Flashing and Trim:
  - 1. Formed roof-drainage sheet metal fabrications.
  - 2. Formed low-slope roof sheet metal flashings.
  - 3. Formed wall sheet metal fabrications.
  - 4. Formed equipment support flashings.
  - 5. Sheet metal counter flashing.
- D. Miscellaneous materials.
- E. Removal of existing roofing system.

1.2 REFERENCES

- A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:
  - 1. ASTM D 1079 “Standard Terminology Relating to Roofing and Waterproofing.”
  - 2. Glossary of NRCA’s “The NRCA Roofing and Waterproofing Manual.”
  - 3. Roof Consultants Institute “Glossary of Building Envelope Terms.”
- B. Sheet Metal Terminology and Techniques: SMACNA “Architectural Sheet Metal Manual.”

1.3 DESIGN CRITERIA

- A. General: Installed roofing membrane system to remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials to be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Installer to comply with current code requirements based on Authority Having Jurisdiction.
- D. Wind Uplift Performance: Roofing system to be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Materials to be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

#### 1.4 SUBMITTALS

##### A. Moisture Mitigation Plan Submittal:

- 1. Contractor shall prepare and submit a 3-part moisture mitigation plan to address potential inclement weather and for District and Architect approval prior to commencement of work. The moisture mitigation plan shall include the following:
  - 2. Part 1: Prevention
    - a. Contractor's protocol for obtaining and reviewing weather forecast during construction and disseminating forecasted weather information and concerns to the Project Team. Include weather forecast source, intervals at which the forecast will be reviewed and the Contractor's method for disseminating forecasted weather-related impacts or concerns to the Project Team.
    - b. Contractor's protocol for weatherizing building at end of each work day
      - 1) Include a roof plan showing areas where temporary weatherization are to be employed with detailed information of materials and techniques used to achieve temporary weatherization. Provide drawing details as needed to clarify intent and reference details on plan. If re-roof is to be phased, submit requested roof plan for each phase
      - 2) Provide a list of key members of the Construction team involved with end-of-day weatherization and their associated roles and responsibilities (e.g., Those responsible for performing the work, those responsible for overseeing work being performed, those responsible for a quality control check after work is completed, etc...)
    - c. Provide list of equipment and where it is to be stored on-site for full project duration and for the sole purpose of deploying during a wet weather emergency to help minimize immediate wet weather affects to unprotected surfaces and affected interior areas.
    - d. Contractor's Action Plan (To be posted in job trailer or other District-approved location): Provide an organized and cohesive Action Plan for addressing wet weather intrusion. A separate Action Plan shall be provided for each of two scenarios:
      - 1) Scenario A: Wet weather is encountered during the workday with appointed staff available to respond immediately.
      - 2) Scenario B: Wet weather is encountered during off-work hours with few or no appointed construction staff on site.

- 3) For each of the above scenarios, include in the Action Plan (at a minimum) the following:
    - a) Response Team: Appoint a wet weather Response Team capable of adequately implementing contractor's Action Plan. This team shall consist of selected Contractor's staff and those of subcontractors as needed at Contractor's discretion. In addition, the District will provide a list of District and School staff to be included as part of the Response Team. Provide a list for each member of the Response Team and include emergency contact information for each, including name, role, phone number and e-mail address. Include in this list and identify at least one member of Contractor's appointed Response Team who can be reached on a 24-hour, seven days-per-week basis.
    - b) Stakeholder Contact List: The District will provide a list of District stakeholders to be contacted in the event of wet weather intrusion into the building for Contractor's integration with the Action Plan.
    - c) Location of dehumidifying equipment, drip buckets, absorbing blankets, moisture absorbing media, etc. to be employed if unprotected exterior surfaces are exposed to moisture and/or if moisture has penetrated the building envelope into the building's interior. Include instructions for locating and operating equipment if required. Refer to Item Part 1.c above for Contractor's list of equipment and materials to be stored on-site.
    - d) Sequence of Operations: Develop a Sequence of Operations for employing the Action Plan, including prioritizing the individuals to be notified upon implementation of the Action Plan and steps required to ensure moisture mitigation measures' effectiveness throughout the course of the wet weather event. As part of this sequence of operations identify the source and contact information for those responsible in supplying additional moisture mitigation equipment and materials if needed to address significant or prolonged wet weather event.
  - e. Contractor's method for educating Contractor and Subcontractor staff of Moisture Mitigation Plan, including Action Plan, and gaging such staff's preparedness to execute the Contractor's Action Plan.
3. Part 2: Immediate Response
    - a. Provide written protocol for implementing Action Plan for both scenarios identified above.
  4. Part 3: Moisture and Mold Mitigation
    - a. Identify Contractor's protocol for quantifying wet weather related impact to exposed exterior surfaces and interior spaces and how Contractor intends to disseminate this information to The District and Architect. Include description of technologies to be employed for moisture detection in concealed and unconcealed locations. Initial verbal notification to the Owner and Architect shall take place within 24 hours of a water intrusion event.

- b. Identify measures to be taken after immediate wet weather event to ensure continued moisture and mold mitigation response. Include Contractor's protocol for drying and/or cleaning of school assets impacted by wet weather, including electronics, books, classroom and office furniture, etc.
  - c. Describe the conditions under which Contractor-provided moisture and mold mitigation equipment and materials/supplies would be disengaged following a wet weather intrusion.
  - d. Provide written confirmation that Contractor intends to work collaboratively with and support an Owner or Architect-contracted industrial hygienist or other moisture and mold mitigation expert. Such subcontractor may be hired at Owner's discretion to help quantify the locations and effects of wet weather related impacts for Contractor remediation.
  - e. Outline Contractor's protocol for wet weather-related clean up.
- B. Product Data: Manufacturer's data sheets for each product to be provided.
- C. Roof Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:
  - 1. Base flashings and membrane terminations.
  - 2. Tapered insulation, including slopes. Provide complete set of tapered insulation shop drawings. Basis-of-Design Service Provider Requirement: Tapered Design; [www.tapereddesign.com](http://www.tapereddesign.com).
  - 3. Crickets, saddles, and tapered edge strips, including slopes.
  - 4. Insulation fastening and adhesive patterns.
- D. Tapered Insulation – Shop Drawings: Provide comprehensive panel layout of roof plans and sections as required to identify slopes in regard to hips, valley's, ridges and to all drain locations. Identify thickness of insulation in relation to all applicable existing conditions to include curb mounted equipment, parapet heights, door and structure elevation impacts, potential obstructions and ponding issues.
- E. Sheet Metal Detail Drawings:
  - 1. Include plans, elevations, sections and attachment details.
  - 2. Distinguish between shop and field assembly work.
  - 3. Include identification of finish for each item.
  - 4. Include pattern of seams and details of termination points, expansion joints and expansion joint covers, direction of expansion, roof penetration flashing, and connections to adjoining work.
- F. Verification Samples: Provide for each product specified.
- G. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- H. Maintenance Data: Provide for all products.
- I. Warranty: Provide manufacturer's current warranty specimen.



- J. Prior to beginning the work of this section, roofing sub-contractor to provide a copy of the final System Assembly Letter issued by manufacturer indicating that the products and system to be installed to be eligible to receive the specified manufacturer's warranty when installed by a certified contractor in accordance with the application requirements, inspected and approved by the manufacturer's Technical Representative.
- K. Prior to roofing system installation, roofing subcontractor to provide a copy of the Warranty Application Confirmation document issued by the manufacturer indicating that the project has been reviewed for eligibility to receive the specified warranty and registered.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's warranty with a minimum of five years of experience with work of this type.
- B. Manufacturer Qualifications: Qualified manufacturer that has previous applications for roofing system identical to that used for this Project with a minimum of 10 years of experience providing roofing systems of this type.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 329.
- D. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system to be labeled by the single source roofing manufacturer issuing the warranty.
- E. Fire-Test-Response Characteristics: Roofing materials to comply with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer's 30-year total system No Dollar Limit Roofing System Warranty.
  - 1. Single-source special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
- B. Installer's Warranty: Submit roofing Installer's warranty for the following warranty period:
  - 1. Warranty Period: 2-years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: GAF
- B. Johns Manville
- C. Firestone

2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING MEMBRANE

- A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D 6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced.
  - 1. Membrane Thickness: 80-mil (nominal)
  - 2. Exposed Face Color: White

2.3 AUXILIARY ROOFING MATERIALS – SINGLE PLY

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  - 1. Liquid-type auxiliary materials to meet VOC limits of Authorities Having Jurisdiction.
- B. Sheet Flashing: Manufacturer's internally reinforced or scrim reinforced, smooth backed membrane with same thickness and color as sheet membrane.

- C. Sheet Flashing (Self-Adhered): 80-mil thick, manufacturer's internally reinforced or scrim reinforced with weldable selva edges on each side of roll, one encapsulated edge and self-adhering capabilities in a wide installation temperature range.
  - 1. Serviceable Installation Substrate Temperature: 20°F (-7°C) and rising.
- D. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
  - 1. Serviceable Installation Ambient Air Temperature: 25°F and rising
- E. Self-Adhered Primer: One-part penetrating primer solution to enhance the adhesion of self-adhering membranes. SA Primer.
- F. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.
- G. Membrane Fasteners and Plates: Factory-coated steel fasteners and galvalume coated steel plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening TPO membrane materials to substrate, and acceptable to membrane roofing system manufacturer. #15 Fasteners and Steel Membrane Plates, or #14 All Purpose Fasteners and Steel Insulation Plates. **Note:** Attachment of TPO membrane and insulation at field of roof areas to be done with TPO Induction Welding Plates (RhinoBond), see below description.
  - 1. Induction Welding Plate: A round specially coated galvalume plate with a recessed center and raised flat bonding surface specifically designed for induction welding application.
- H. Miscellaneous Accessories: Provide pourable sealers, primers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, cover strips, and other accessories required for full installation.

## 2.4 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi).
  - 1. Provide insulation package with minimum LTTR Value 30.
  - 2. Provide insulation package in 2-layers of 2.6-inch flat stock, resulting in a combined LTTR-Value 30.
  - 3. Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch, as determined in accordance with CAN/ULC S770 at 75°F (24°C).

## 2.5 TAPERED INSULATION AND/OR CRICKETING MATERIALS

- A. Tapered Insulation and/or Cricketing Materials – Where Required: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated on Drawings.

**2.6 HIGH-DENSITY POLYISO COVER BOARD**

- A. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs. of compressive strength.
  - 1. Thickness: 1/2 inch.
  - 2. R-value: 2.5.

**2.7 INSULATION ACCESSORIES**

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- C. Insulation Fasteners and Induction Welding Plates: Factory-coated steel fasteners and galvalume coated steel plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening TPO membrane and insulation materials to substrate, and acceptable to membrane roofing system manufacturer. #15 Fasteners and Steel Membrane Plates, or #14 All Purpose Fasteners and Steel Insulation Plates. Note: Attachment of TPO membrane and insulation at field of roof areas to be done with TPO Induction Welding Plates (RhinoBond).
  - 1. TPO Induction Welding Plates: A round specially coated galvalume plate with a recessed center and raised flat bonding surface specifically designed for induction welding application.
- D. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate, where/if required.
- E. Wood Nailer Strips.

**2.8 VAPOR BARRIER**

- A. Self-Adhered SBS Vapor Retarder: Tri-laminate woven polyethylene, nonslip UV protected top surface; suitable for application method specified.

**2.9 EDGE METAL COMPONENTS**

- A. Coping Metal System at Parapet Wall Conditions: Provide manufacturer's factory fabricated metal coping consisting of anchor bar and a snap-on cap components. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit warranty.
- B. All exposed sheet metal flashing to be minimum 24 gauge with Kynar 500 or Hylar 5000. Match existing colors.

- C. Drip & Rake Edge Metal Components: Provide TPO membrane clad drip and rake edge components where required, including at gutter drip edge conditions. Drip and rake edge components to include a continuous cleat on the outside exterior edge.
- D. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

## 2.10 WALKWAY PADS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer.

## 2.11 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, clinch lock, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Roof Drain Strainer Cover: Replace damaged roof drain strainer covers. Replacement covers to be cast iron only.
- C. Fasteners: Wood screws, annular threaded nails, self-tapping screws, bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  - 1. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
  - 2. Fasteners for Zinc Coated (galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.
- D. Solder - For Stainless Steel: ASTM B32, Grade Sn96, with acid flux of type recommended by stainless steel sheet manufacturer.
- E. Butyl Sealant Tape: 100 percent solids, asbestos free, butyl sealant tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch (13 mm) wide and 1/8 inch (3 mm) thick.
  - 1. Manufacturer: Schnee Morehead, Inc.; SM5227 Tacky Tape Sealant.

## PART 3 - EXECUTION

### 3.1 EXAMINATION GENERAL

- A. Verify that roof openings and penetrations are in place, set and braced and that roof drains are securely clamped in place.
- B. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses and elevation height of insulation and/or cover board materials.

**3.2 RE-ROOF PREPARATION: ROOF “A” MECHANICALLY ATTACHED**

- A. Overall Roof Plan and Key Plan: Refer to Drawings, including Key Plan and Overall Roof Plan, for identification of roof related work that falls under this specification.
- B. Existing BUR Roofing System to Be Removed: The existing roofing system is to be completely removed down to the roof deck substrate. Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc. Existing Roof Core Results: Existing roof system consists of two (2) Tremco BUR roof systems w/pea-gravel and insulation over plywood roof deck substrate. Maximum thickness is approximately 2-1/2”.
- C. Existing Roof Base Flashings: Tear out, remove, and discard of all existing roof base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of the new cover board and roof membrane system.
- D. Abandoned Equipment and/or Penetrations: Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations. Where/if necessary, to infill, install new plywood roof deck sheathing. New sheathing to match existing.
- E. Existing Equipment Curbs: Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
  - 1. Modify curbs as required to provide a minimum 8-inch base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
  - 2. Secure top of flashing and install new metal counterflashing prior to re-installation of unit.
- F. Remove Debris Prior to New Roof Installation: Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to new roofing installation and in accordance with roofing system manufacturer's written instructions. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove all debris from roof surface prior to new roof installation. Demolished roof system materials may not be stored on the roof surface.
- G. Unsatisfactory Conditions: Proceed with installation only after unsatisfactory conditions have been corrected.

**3.3 VAPOR-RETARDER INSTALLATION**

- A. Vapor Barrier SAR Membrane: Adhere vapor barrier SAR directly over the plywood roof deck substrate. Vapor Barrier SAR is a self-adhering membrane. Note: Priming of the roof deck substrate is not required.

**3.4 FLAT STOCK AND TAPERED INSULATION INSTALLATION**

- A. Protection: Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing insulation materials.

- C. Flat Stock Insulation 2-Layers 2.6-inch: Install 2-layers of 2.6-inch Flat Stock Insulation directly over the previously installed vapor barrier membrane. Combined flat stock insulation materials to equate to a minimum LTTR-30. Materials are initially loose-laid into position.
- D. Tapered Insulation and/or Tapered Cricketing Materials: Where defined on the Drawings, install tapered insulation and/or tapered cricketing materials under area of roofing to conform to slopes indicated. Materials are initially loose-laid into position.
- E. Staggered Joints Insulation Board: Install insulation boards with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch with cover board.
  - 1. Cut and fit insulation board within 1/4 inch of nailers, projections, and penetrations.
- F. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

### 3.5 COVER BOARD INSTALLATION

- A. Protection: Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. 1/2-inch HD Polyiso Cover Board – Mechanically Fastened: Mechanically attach cover board and underlying insulation boards in one pass to the plywood roof deck substrate using #15 Fasteners or #14 All Purpose Fasteners, and TPO RhinoBond Plates. Fastening density of cover board to be 6/10/15 fasteners and TPO RhinoBond Plates per 4' x 8' panel at field/perimeter/corner locations.
- D. Staggered Joints Cover Board: Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch with cover board.
  - 1. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations.
- E. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

### 3.6 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
- B. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
  - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.7 INDUCTION WELDED TPO ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roofing membrane and allow to relax before installing.
- C. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Apply roofing membrane with side laps shingled with roof slope, where possible.
- E. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
  1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
  2. Verify field strength of seams a minimum of twice daily and repair seam sample areas. Remove and repair any unsatisfactory sections before proceeding with Work.
  3. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.
- F. Induction Welding Installation:
  1. Perform calibration and set-up as detailed by the Induction Welder Owner's Manual
  2. Center the Induction Welder over the first plate in pattern and activate the weld.
    - a. Induction Welder to be centered over the plate to create a 100% bond.
    - b. If an error occurs during activation, refer to the induction welder owner's manual for corrective action.
  3. Prior to every use, clean face of Heat Sink Magnet.
  4. Place Heat Sink Magnet over the welded plate.
    - a. Keep Heat Sink Magnet in place at least 45 seconds while the assembly cools.
  5. Repeat process for each plate.
- G. Perimeter and Corner Membrane Enhancements: Perimeter and corner membrane enhancements are required at all exposed roof edge perimeters and corners.
  1. Formulas for determining dimensions of perimeters and corners are as follows: Use 10% of the lesser plan dimension, or 40% of the roof elevation height, whichever is the lesser.
  2. Use TPO RhinoPlates and the Induction Welding process for creating perimeter and corner enhancements.



- H. At drains, spread sealant or mastic bed over deck drain flange and securely seal roofing membrane in place with clamping ring.

### 3.8 MEMBRANE BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates in accordance with membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### 3.9 DRIP AND RAKE EDGE FLASHINGS:

- A. Drip and Rake Edge Metal Flashings: At drip and rake edge conditions, including where gutter conditions exist, install new TPO membrane clad drip and rake edge metal flashings, where required.
- B. Drip and rake edge materials to incorporate a continuous cleat installed on the outside vertical face.
- C. Flash in and make watertight using 6-inch wide TPO Cover Strip.
- D. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

### 3.10 COPING METAL AT PARAPET WALL CONDITIONS:

- A. At parapet wall conditions where coping metal is required, install new coping metal materials.
- B. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

### 3.11 WALKWAY PAD INSTALLATION

- A. TPO Hot-Air Weldable Walkway Pads: Install TPO Hot-Air Weldable Walkway pads at locations indicated on the Drawings.
- B. Install in accordance with manufacturer's written instructions.

**3.12 SPECIAL CONDITIONS AT COVERED PLAY AREA: ROOF “B” FULLY-ADHEARED**

- A. Fastener Penetration Not Permitted at open and exposed Covered Play Area Roofs: Fastener penetration through the plywood roof deck substrate is not permitted at exposed Covered Play Area Roofs.
- B. Roof Deck Substrate: Plywood roof deck substrate.
- C. Existing BUR Roofing System to be Removed: At Play Area Roofs, the existing BUR roofing system is to be completely removed down to the wood roof deck substrate. Existing base flashings to be removed, and curb and wall substrates properly prepared for new membrane base flashing materials. Note: Existing roof consists of one (1) Tremco BUR roof system w/pea-gravel and wood fiber cover board over plywood roof deck substrate. Maximum thickness is approximately 1-inch.
- D. Wood Nailers: 1/2-inch thick wood nailers are required at all drip and rake edge conditions. Where existing materials are in poor condition or do not currently exist, install new wood nailer materials.
- E. 1/2-inch High-Density Polyiso Cover Board – Adhered Direct to Wood Deck with Two-Part Urethane Insulation Adhesive: Adhere new cover board directly to wood roof deck substrate using Two-Part Urethane Insulation Adhesive at a bead spacing density of 12/6/4 inches on center at field/perimeter/corner locations.
- F. 80-mil TPO – Adhered: Adhere TPO 80-mil thick membrane over the previously installed cover board materials. Membrane to be adhered with TPO Membrane Bonding Adhesive – Solvent Based.
- G. 80-mil Membrane Base Flashings at Curb & Wall Conditions – Adhered: Proceed to adhere new TPO 80-mil membrane base flashings at all curb and wall conditions. Membrane to be adhered with Membrane Bonding Adhesive – Solvent Based.
- H. Drip, Rake Edge, and/or Coping Metal Materials – Where Required: Install new TPO Membrane Clad Drip and/or Rake Edge materials, and/or Coping Metal flashing materials where required. Edge metal flashings to incorporate a continuous cleat on the outside vertical face. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

**3.13 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.
  - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.14 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075423



**TECH/NORTHWEST, INC.**

ROOF CONSULTING, MOISTURE TESTING & ANALYSIS

# **ROOF INSPECTION REPORT**

*(Limited Visual Inspection)*

*Conducted For:*

**BEAVERTON SCHOOL DISTRICT**

Beaverton, Oregon

*Facility Inspected:*

**Elmonica Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary**

**Project Number: 20054**

**March 16, 2020**



## ROOF INSPECTION REPORT

*(Limited – Visual)*

**Inspection Date:** March 16, 2020  
**Project #:** 20054

**Inspection #:** V-01  
**Report Date:** 3/26/20

**Company:** BEAVERTON SCHOOL DISTRICT  
16550 SW Merlo Road  
Beaverton, OR 97003-5152

**Attn:** Megan Finch  
Project Manager  
503-356-4587  
[Megan\\_Finch@beaverton.k12.or.us](mailto:Megan_Finch@beaverton.k12.or.us)

**Inspected Facility:**  
Elmonico Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary

**Present at Inspection:**  
Megan Finch..... Beaverton School District  
Patrick Schmautz..... A-Tech/Northwest, Inc.  
Doug Coddington..... A-Tech/Northwest, Inc.

### PART I - DISCUSSION

#### **A. PURPOSE:**

1. The purpose of the inspection is to review the existing condition of the roofs at the five (5) schools.
  - a. The available history of the building is minimal. This report is based on the information supplied and this visual inspection.
  - b. One (1) core sample was cut at each school to determine the general roof construction / component data.
2. The following is a summary review of the results of this inspection.

#### **B. GENERAL ROOF/BUILDING INFORMATION:** *(Refer to as-built drawings for Roof ID's)*

##### **1. Elmonica Elementary School – Modular Building**

###### **a. Built-up Roofs (Roofs I-DD):**

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2003 (*17 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

2. Errol Hassell Elementary School – Modular Building

a. Built-up Roofs (Roofs I-V):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... Reported to be 2001 or 2009 (*11 or 19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

3. Hiteon Elementary School

a. Built-up Roofs (Roofs A-L):

- (1) Roof Type:..... Pea Gravel Built-up Roof (*Roof-over-roof*)
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... ½" Fiberboard Top Roof (*R Value 1.4 approx.*)  
¾" Perlite Bottom Roof (*R-Value 2 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2004 (*16 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

4. Montclair Elementary School

a. Built-up Roofs (Roofs A-H):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2009 (*11 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

5. Jacob Wismer Elementary School

a. Built-up Roofs (Roofs A-I):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2001 (*19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

**C. INTERIOR LEAKAGE:**

1. Elmonica Elementary School:
  - a. No current interior leakage reported. Previous interior leakage reported at equipment at a few locations.
2. Errol Hassell Elementary School:
  - a. Current interior leakage at repair area at northeast section of the building. Previous interior leakage reported at a few pipes in the roof field.
3. Hiteon Elementary School:
  - a. No current interior leakage reported.
4. Montclair Elementary School:
  - a. Current interior leakage reported at several locations.
5. Jacob Wismer Elementary School:
  - a. Current interior leakage reported along parapet at southwest section of the building and at west section of the building.

**PART II - RE-ROOF OPTIONS**

**A. Single-ply Roof System Types Recommended:** *(in the following order)*

1. Mechanically attached TPO *(minimum 60 mil)*.
2. Fully adhered TPO *(minimum 60 mil)*.
3. Mechanically attached EPDM *(minimum 60 mil)*.
4. Fully adhered EPDM *(minimum 60 mil)*.

**B. Coating:**

1. Coating is **not** recommended for these roofs due to gravel and condition of the existing roofs.

**PART III – BUDGET ESTIMATE**

**A. Remove and Replace:**

|                                           |                                    |
|-------------------------------------------|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 500,000.00 to \$ 550,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 300,000.00 to \$ 350,000.00     |
| 3. Hiteon Elementary School:.....         | \$ 1,260,000.00 to \$ 1,550,000.00 |
| 4. Montclair Elementary School:.....      | \$ 1,100,000.00 to \$ 1,350,000.00 |
| 5. Jacob Wismer Elementary School:.....   | \$ 1,300,000.00 to \$ 1,600,000.00 |

**B. Recover:**

|                                           |                                    |
|-------------------------------------------|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 460,000.00 to \$ 490,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 270,000.00 to \$ 290,000.00     |
| 3. Hiteon Elementary School:.....         | n/a <i>(roof-over-roof)</i>        |
| 4. Montclair Elementary School:.....      | \$ 850,000.00 to \$ 1,000,000.00   |
| 5. Jacob Wismer Elementary School:.....   | \$ 1,000,000.00 to \$ 1,200,000.00 |



If you have any questions concerning this inspection and/or the report, please contact our office.  
The opportunity to submit this information is appreciated.

Respectfully submitted,

**A-Tech/Northwest, Inc.**

*Doug Coddington* (electronic)

Doug Coddington, RCI  
Vice President

Attachment: Photo Section  
As-Built Drawings

Copy to: Master Files

**- End of Report -**





**EE. 1.01 – View to south of the front elevation of Elmonica Elementary school.**



**EE. 1.02 – View to northeast of roof top equipment at the north section of roof.**

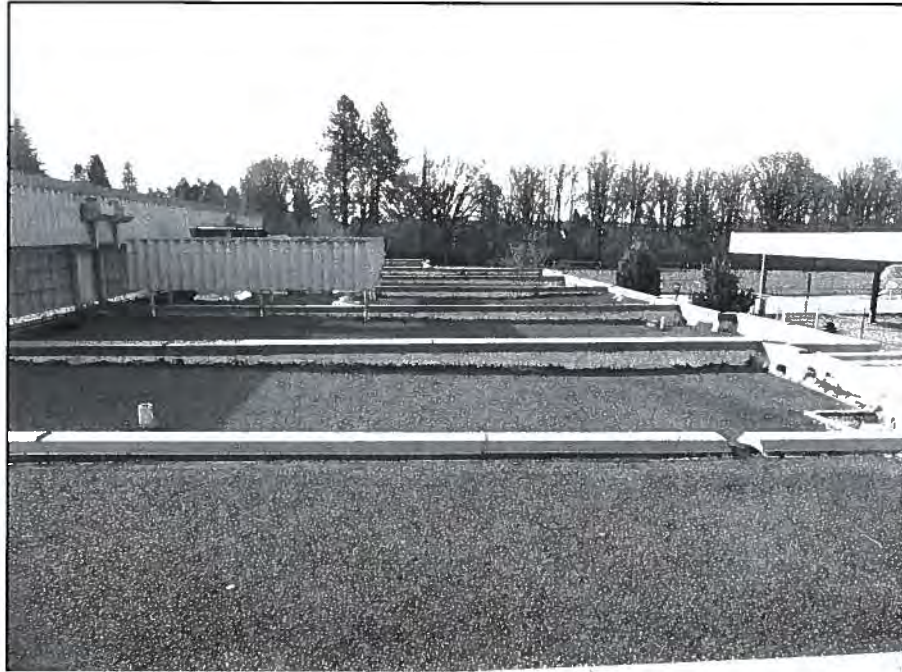


**EE. 1.03 – View of typical roof drain & overflow scupper with previous repairs starting to fail.**



**EE. 1.04 – View to the south of the upper section of the roof.**





**EE. 1.05 – View to the west of the north section of the roof.**



**EHE. 1.01 – View to south of the front elevation of Errol Hassell Elementary school.**

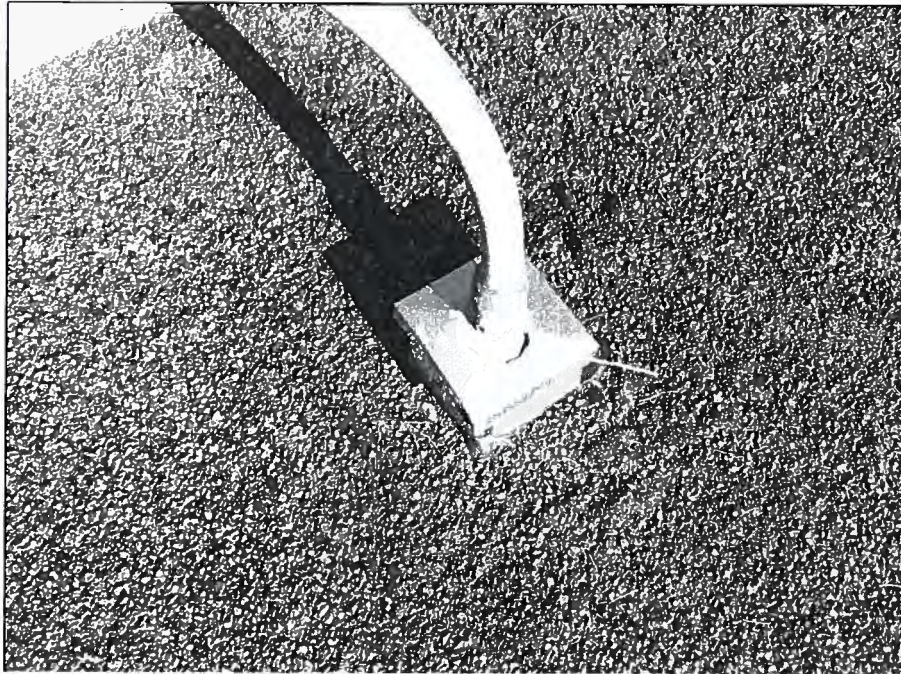


**EHE. 1.02 – View to the west of the north section of the roof.**



**EHE. 1.03 – View of repair at current interior leakage area at northeast section of the roof.**

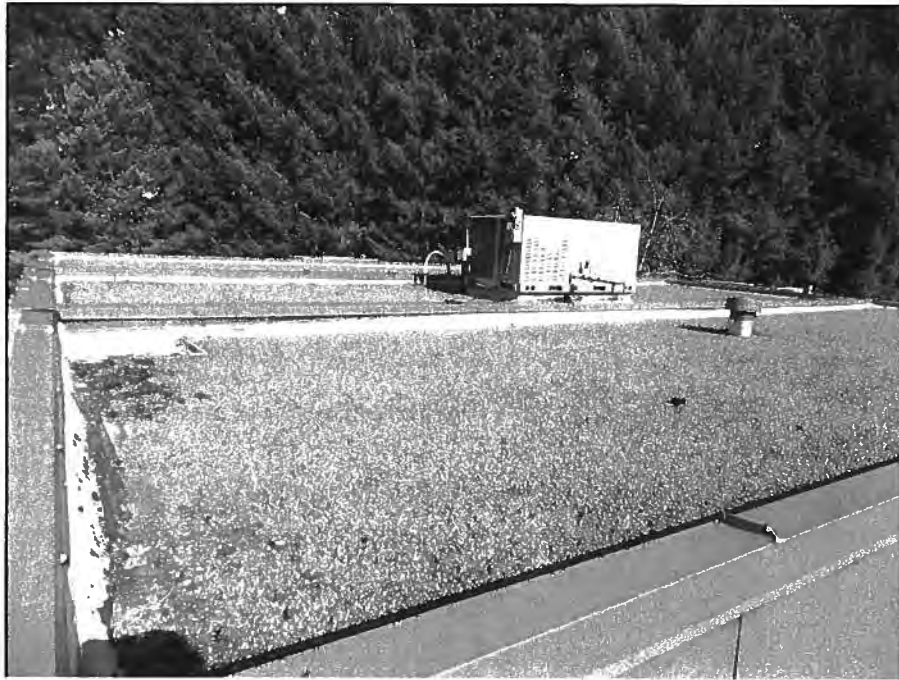




**EHE. 1.04 – View of void in the cap of penetration flashing at northeast section of roof.**



**EHE. 1.05 – View of typical roof drain scupper with splits and coating deterioration.**

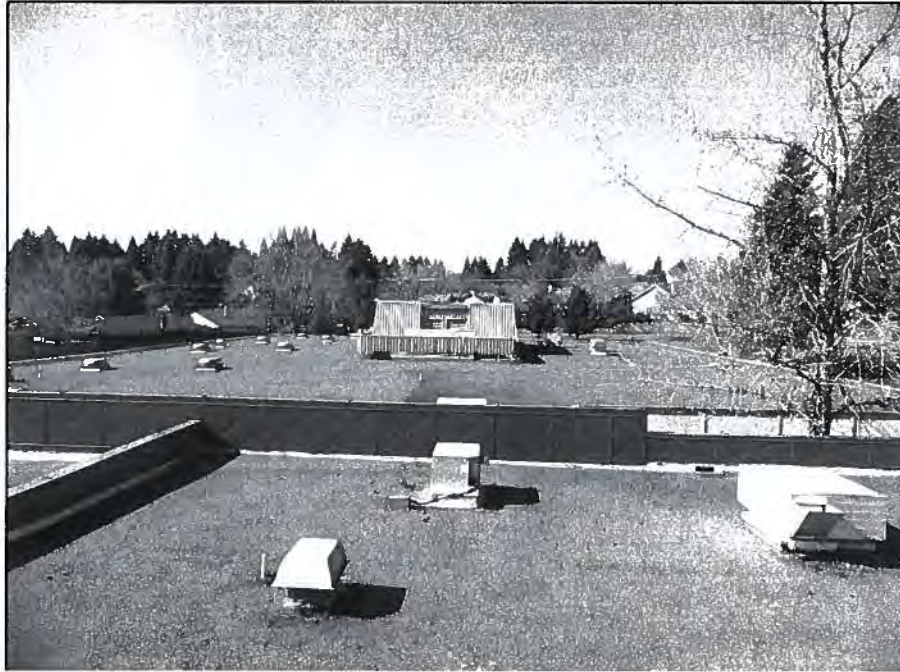


**EHE. 1.06 – View to northwest of the upper roof areas.**

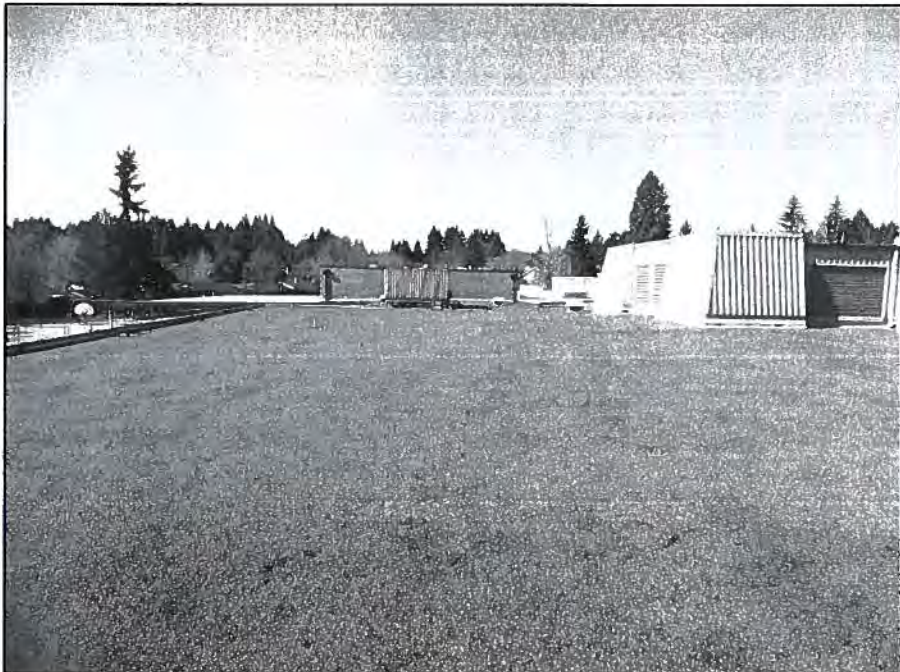


**HE. 1.01 – View to west of the front elevation of Hiteon Elementary school.**





**HE. 1.02 – View to west at the west section of the roof.**



**HE. 1.03 – View to the west of the southeast section of roof.**



**HE. 1.04 – View of typical roof drain and overflow drain at the east section of the roof.**



**HE. 1.05 – View of typical roof drain and overflow scupper at the northwest section of the roof.**





**HE. 1.06 – View to the west of coated roof system at the covered playground section of roof.**



**ME. 1.01 – View to south of front elevation of Montclair Elementary school.**



**ME. 1.02 – View to east at southwest section of the roof with ponding water and moss build-up.**

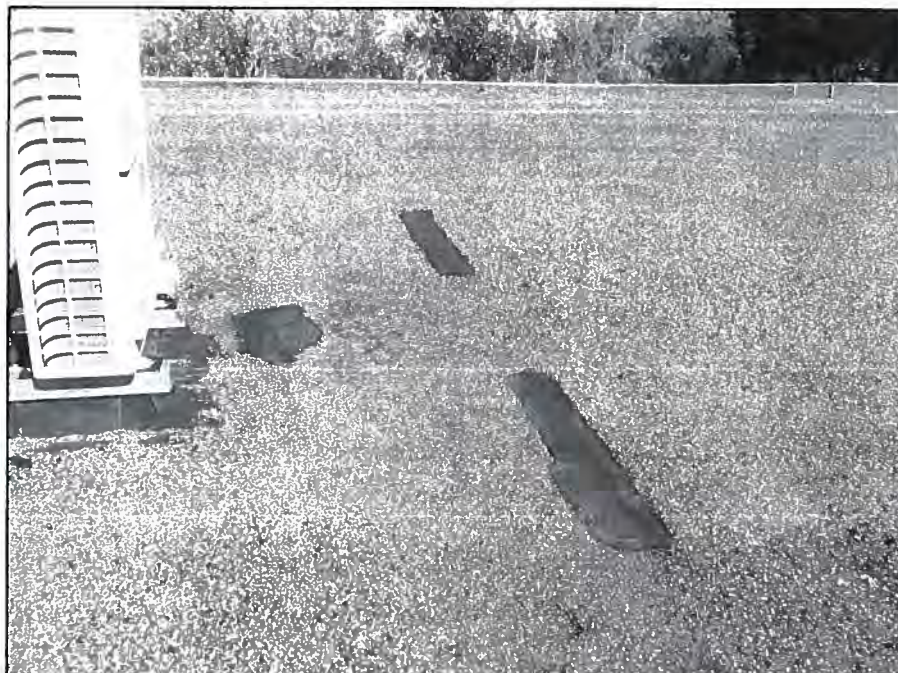


**ME. 1.03 – View of typical roof drain and overflow drain with evidence ponding water and moss build-up at the east section of the roof.**

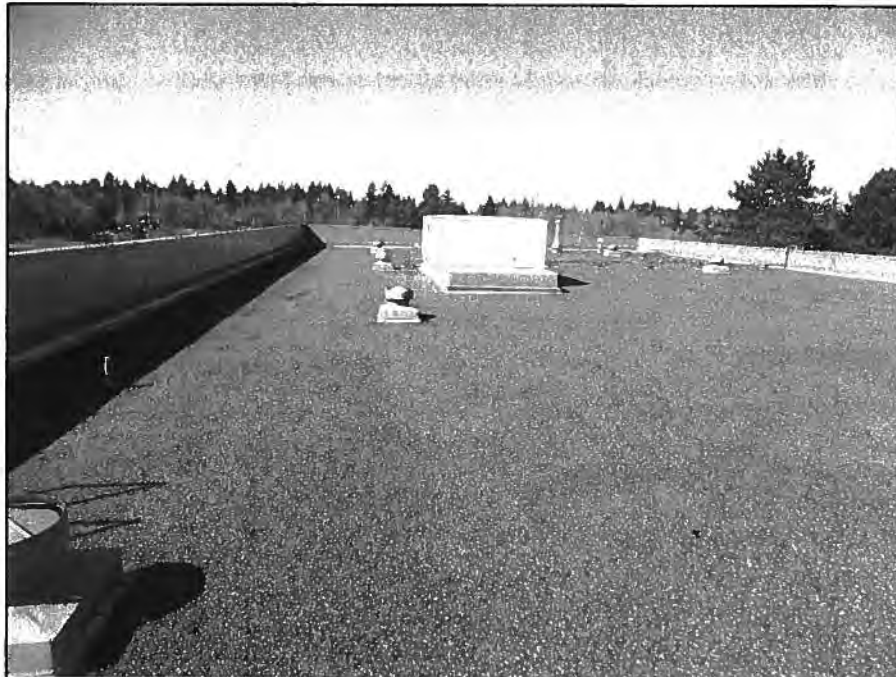




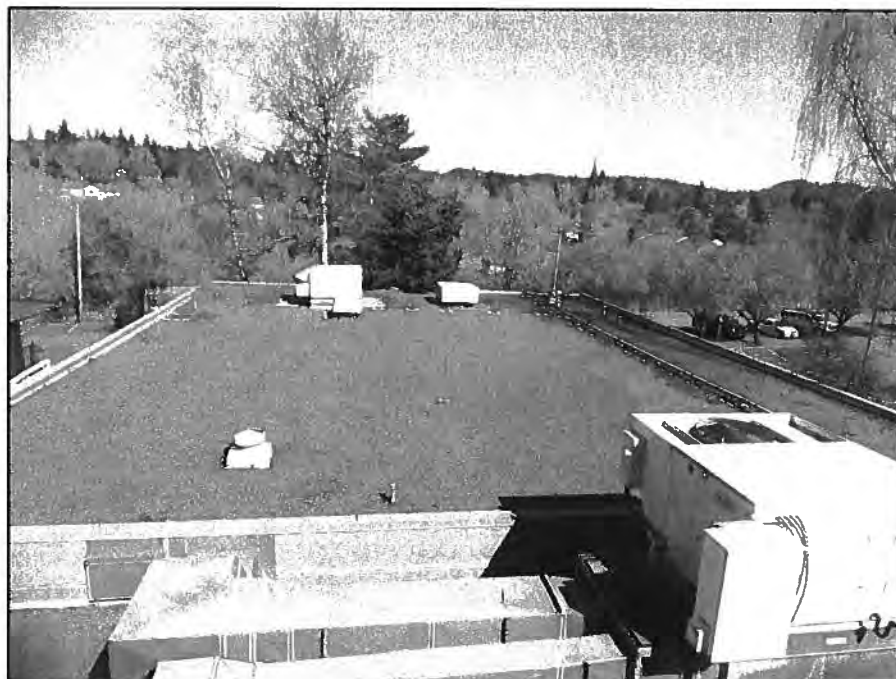
**ME. 1.04 – View to the east at the north section of the roof.**



**ME. 1.05 – View of typical repairs at the east section of the roof.**



**ME. 1.06 – View to west with ponding water and moss build-up along south section of roof.**

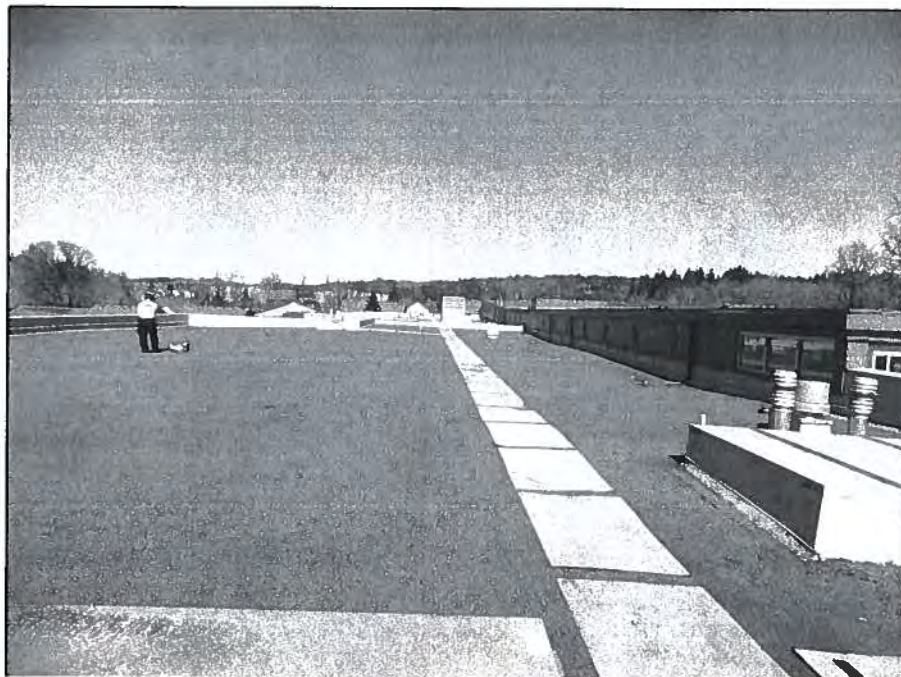


**ME. 1.07 – View to the north of northwest roof with evidence of moss build-up.**

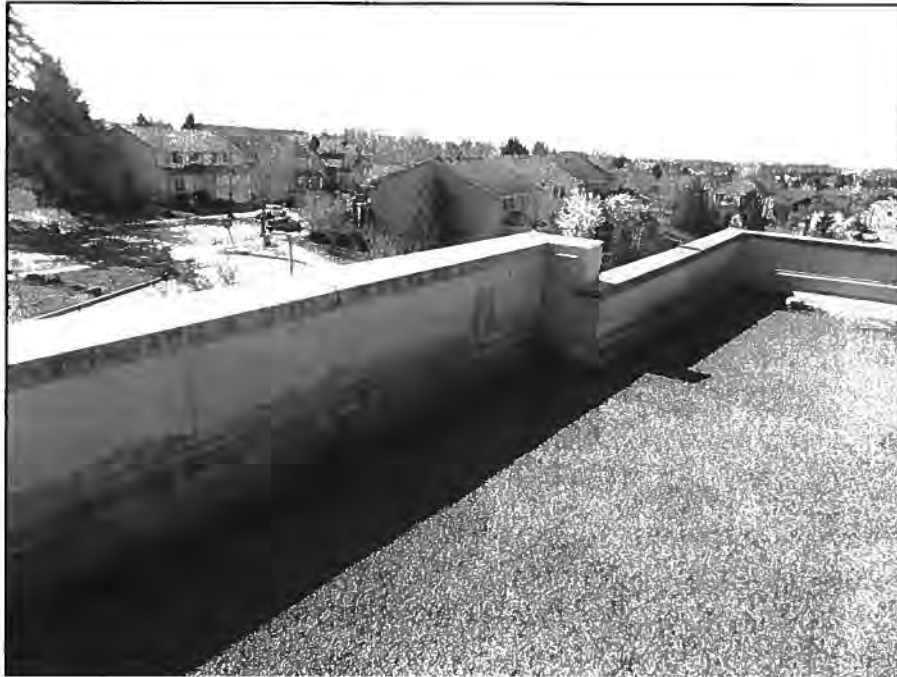




**JWE. 1.01– View to north of the front elevation of Jacob Wismer Elementary school.**



**JWE. 1.02– View to north of the southwest section of roof.**

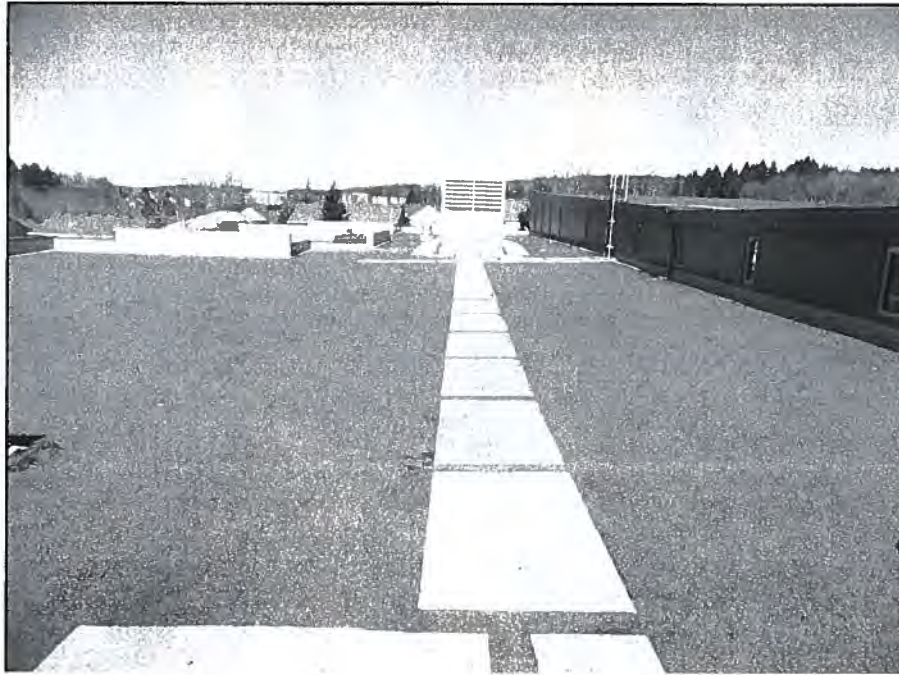


**JWE. 1.03– View of typical wall metal and coping flashing at the southwest section of roof, area has had previous leaks.**



**JWE. 1.04– View of typical roof drain and overflow drain at the west section of the roof.**





**JWE. 1.05– View to the north at the northwest section of roof.**



**JWE. 1.06 – View of fiberglass exposed in membrane at large roof top unit at the northwest section of the roof.**



**JWE. 1.07– View of moss and organic debris on roof at the southeast section of roof area.**

**- End of Photo Section -**

17347 37-25-17 Central SD Central High School V05 18 Photo



SW Lisa Ct

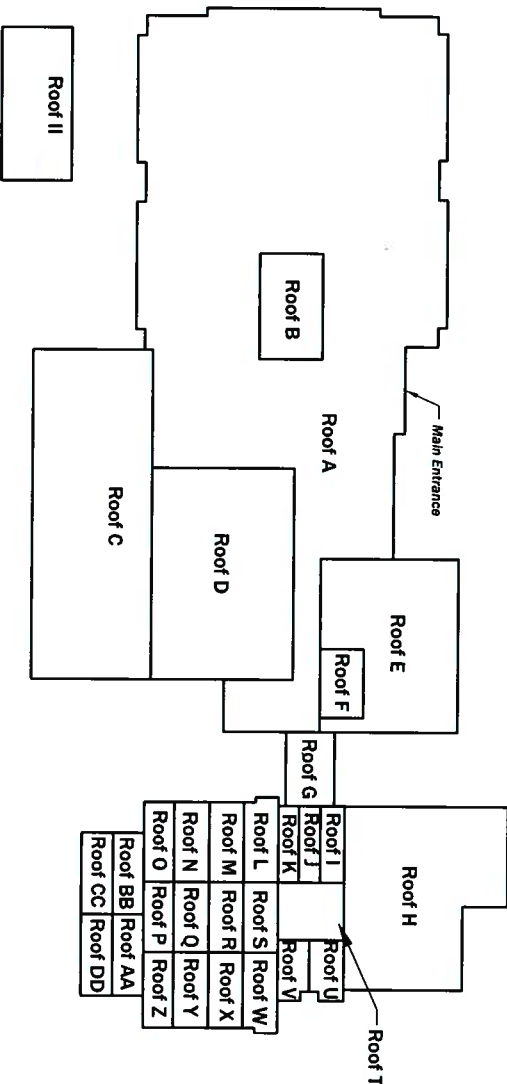
Roof KK

Roof JJ

Parking

Parking

SW 170th Ave



# Single-ply ROOF AREA SQ.FT. (Approximate)

|         |           |
|---------|-----------|
| Roof A: | 26,654 sf |
| Roof B: | 7,470 sf  |
| Roof C: | 5,550 sf  |
| Roof D: | 3,891 sf  |
| Roof E: | 559 sf    |
| Roof F: | 673 sf    |
| Roof G: | 4,884 sf  |
| Roof H: | 49,681 sf |
| Total:  | 49,681 sf |

# Gravel ROOF AREA SQ.FT. (Approximate)

|          |           |
|----------|-----------|
| Roof B:  | 1,251 sf  |
| Roof I:  | 346 sf    |
| Roof J:  | 298 sf    |
| Roof K:  | 298 sf    |
| Roof L:  | 550 sf    |
| Roof M:  | 509 sf    |
| Roof N:  | 509 sf    |
| Roof O:  | 448 sf    |
| Roof P:  | 396 sf    |
| Roof Q:  | 450 sf    |
| Roof R:  | 450 sf    |
| Roof S:  | 450 sf    |
| Roof T:  | 713 sf    |
| Roof U:  | 374 sf    |
| Roof V:  | 340 sf    |
| Roof W:  | 499 sf    |
| Roof X:  | 478 sf    |
| Roof Y:  | 478 sf    |
| Roof Z:  | 421 sf    |
| Roof AA: | 477 sf    |
| Roof BB: | 477 sf    |
| Roof CC: | 495 sf    |
| Roof DD: | 495 sf    |
| Total:   | 10,828 sf |

# Comp Shingle ROOF AREA SQ.FT. (Approximate)

|          |           |
|----------|-----------|
| Roof EE: | 2,076 sf  |
| Roof FF: | 2,110 sf  |
| Roof GG: | 1,979 sf  |
| Roof HH: | 1,934 sf  |
| Roof II: | 2,074 sf  |
| Roof JJ: | 1,034 sf  |
| Roof KK: | 1,026 sf  |
| Total:   | 12,233 sf |

Roof Total: 72,742 sf

## BEAVERTON SCHOOL DISTRICT Elmonica Elementary School - Beaverton, OR

SCALE: NTS  
DATE: 3/30/2020  
DRAWN BY: DVG  
REVISED:  
PROJECT NUMBER: 20054  
A-TECH/NORTHWEST, INC.  
Portland & Pineville, Oregon 503-628-2882  
As-Built Drawing

Elmonica Elementary School  
16950 SW Lisa Ct  
Beaverton, OR

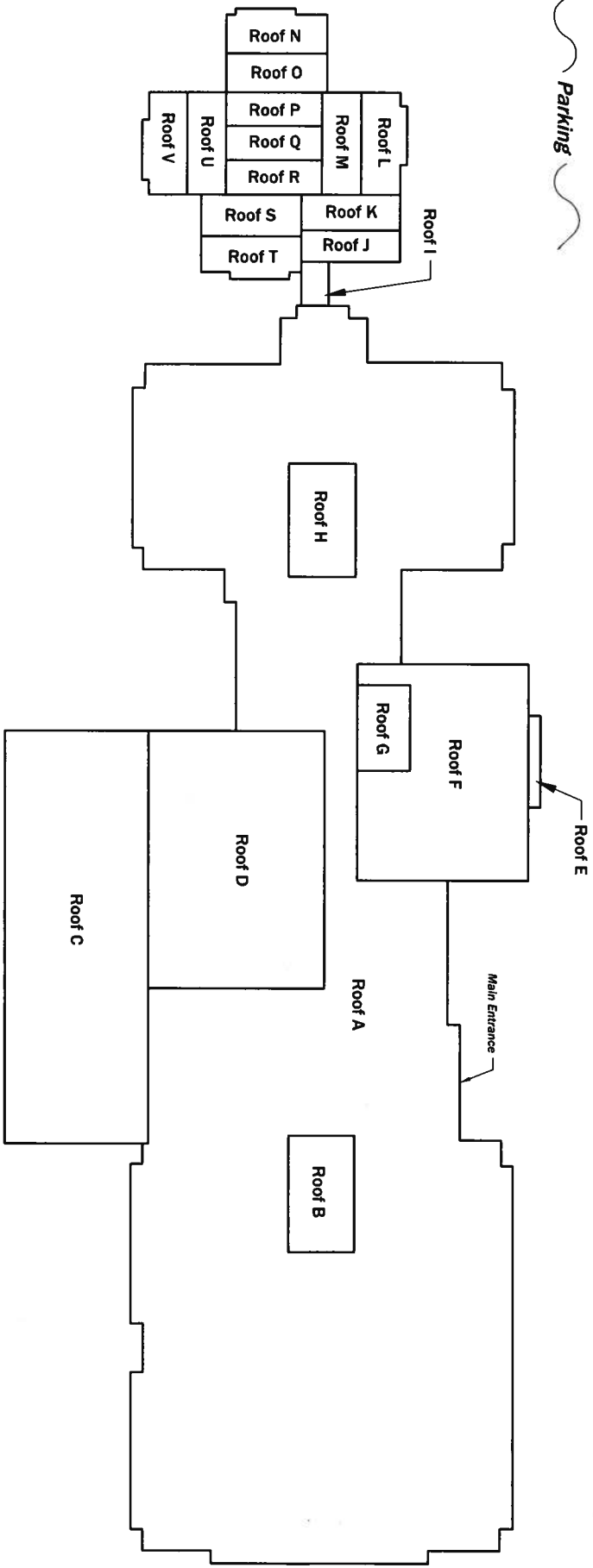


SW Bany Rd

Parking

Parking

Play ground



Single-ply  
ROOF AREA SQ.FT.  
(Approximate)

|         |           |
|---------|-----------|
| Roof A: | 37,808 sf |
| Roof B: | 932 sf    |
| Roof C: | 7,178 sf  |
| Roof D: | 5,462 sf  |
| Roof E: | 133 sf    |
| Roof F: | 3,919 sf  |
| Roof G: | 537 sf    |
| Roof H: | 924 sf    |
| Total:  | 56,893 sf |

Gravel  
ROOF AREA SQ.FT.  
(Approximate)

|         |          |
|---------|----------|
| Roof I: | 147 sf   |
| Roof J: | 375 sf   |
| Roof K: | 422 sf   |
| Roof L: | 527 sf   |
| Roof M: | 487 sf   |
| Roof N: | 519 sf   |
| Roof O: | 475 sf   |
| Roof P: | 391 sf   |
| Roof Q: | 400 sf   |
| Roof R: | 400 sf   |
| Roof S: | 505 sf   |
| Roof T: | 484 sf   |
| Roof U: | 473 sf   |
| Roof V: | 522 sf   |
| Total:  | 6,124 sf |

Errol Hassell Elementary School  
18100 SW Bany Rd  
Beaverton, OR

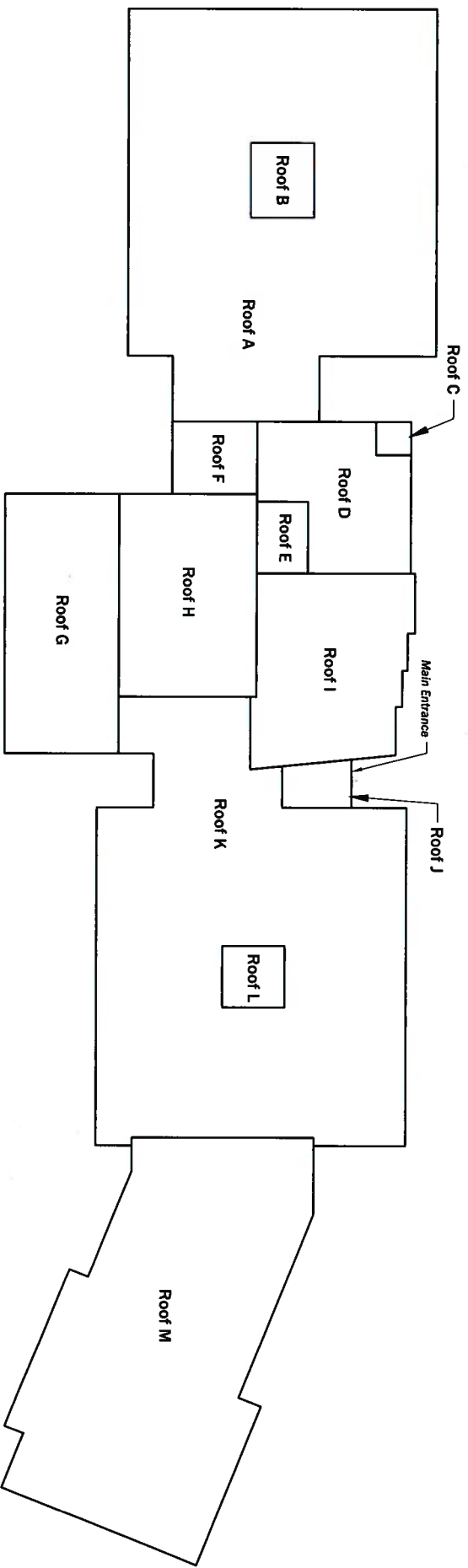


BEAVERTON SCHOOL DISTRICT  
Errol Hassell Elementary School - Beaverton, OR

|                                           |                 |        |                 |
|-------------------------------------------|-----------------|--------|-----------------|
| SCALE: NTS                                | DATE: 3/20/2020 | 1 OF 1 | DRAWN BY: DIV:6 |
| A-TECH/NORTHWEST, INC.                    |                 |        |                 |
| Portland & Pineville, Oregon 503-628-2892 |                 |        |                 |
| As-Built Drawing                          |                 |        |                 |
| PROJECT NUMBER: 20054                     |                 |        |                 |

SW Davies Rd

SW Brockman Rd



Play Ground

Parking

Roof N

**Gravel**  
**ROOF AREA SQ.FT.**  
( Approximate )

|         |           |
|---------|-----------|
| Roof A: | 22,200 sf |
| Roof B: | 936 sf    |
| Roof C: | 233 sf    |
| Roof D: | 3,709 sf  |
| Roof E: | 722 sf    |
| Roof F: | 1,223 sf  |
| Roof H: | 5,533 sf  |
| Roof K: | 22,537 sf |
| Roof L: | 746 sf    |
| Total:  | 57,839 sf |

**Single-ply**  
**ROOF AREA SQ.FT.**  
( Approximate )

|         |           |
|---------|-----------|
| Roof G: | 5,747 sf  |
| Roof I: | 5,690 sf  |
| Roof J: | 627 sf    |
| Roof M: | 16,412 sf |
| Roof N: | 1,330 sf  |
| Total:  | 29,806 sf |

Roof Total:

87,645 sf

Hiteon Elementary school  
13800 SW Brockman Rd  
Beaverton, OR



**BEAVERTON SCHOOL DISTRICT**  
Hiteon Elementary school - Beaverton, OR

SCALE: NTS

DATE: 3/30/2020

1 of 1

DRAWN BY: D.Y.A.


REVISED:

A-TECH/NORTHWEST, INC.

Portland & Prineville, Oregon 503-628-2882

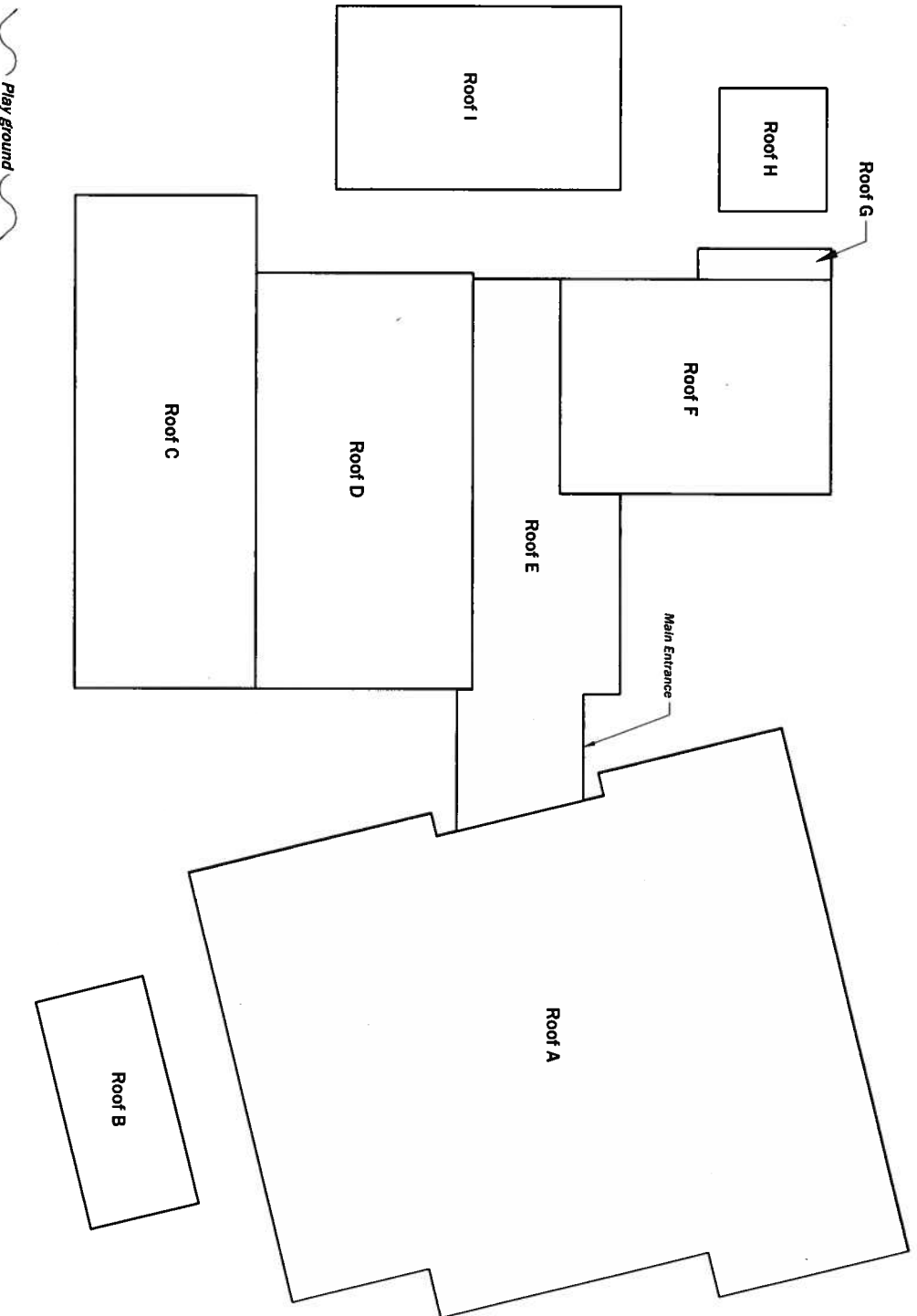
PROJECT NUMBER: 20054

As-Built Drawing



SW Vermont St →

Parking



Montclair Elementary School  
7250 SW Vermont St  
Portland, OR

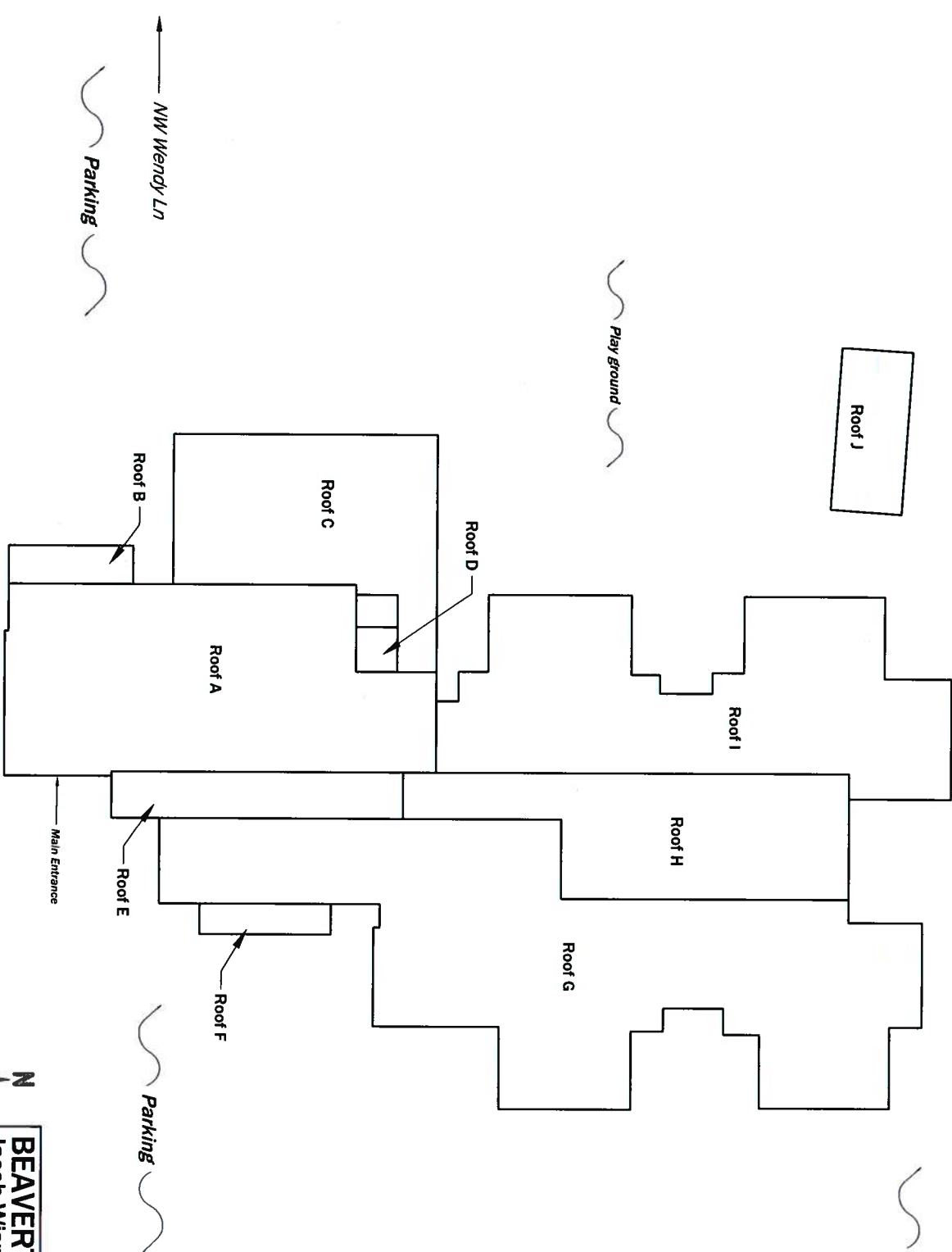
| Gravel           |           |
|------------------|-----------|
| ROOF AREA SQ.FT. |           |
| (Approximate)    |           |
| Roof A:          | 23,323 sf |
| Roof B:          | 1,989 sf  |
| Roof C:          | 6,988 sf  |
| Roof D:          | 7,034 sf  |
| Roof E:          | 4,971 sf  |
| Roof F:          | 4,542 sf  |
| Roof G:          | 323 sf    |
| Roof H:          | 1,013 sf  |
| Total:           | 50,183 sf |
| Single-ply       |           |
| ROOF AREA SQ.FT. |           |
| (Approximate)    |           |
| Roof I:          | 4,028 sf  |
| Roof Total:      | 54,211 sf |

Play ground



|                                            |                       |
|--------------------------------------------|-----------------------|
| <b>BEAVERTON SCHOOL DISTRICT</b>           |                       |
| Montclair Elementary School - Portland, OR |                       |
| SCALE: NTS                                 | 1 of 1                |
| DATE: 3/30/2020                            | DRAWN BY: D.L.G.      |
| A-TECH/NORTHWEST, INC.                     |                       |
| Portland & Prineville, Oregon 503-628-2882 |                       |
| As-Built Drawing                           | PROJECT NUMBER: 20054 |

Jacob Wismer Elementary School  
5477 NW Skycrest Pkwy  
Portland, OR



| Gravel           |           |
|------------------|-----------|
| ROOF AREA SQ.FT. |           |
| ( Approximate )  |           |
| Roof A:          | 11,574 sf |
| Roof B:          | 731 sf    |
| Roof C:          | 6,779 sf  |
| Roof D:          | 291 sf    |
| Roof E:          | 2,111 sf  |
| Roof F:          | 622 sf    |
| Roof G:          | 19,154 sf |
| Roof H:          | 6,804 sf  |
| Roof I:          | 11,582 sf |
| Total:           | 59,648 sf |

| Comp Shingle     |           |
|------------------|-----------|
| ROOF AREA SQ.FT. |           |
| ( Approximate )  |           |
| Roof J:          | 1,794 sf  |
| Roof Total:      | 61,442 sf |


**BEAVERTON SCHOOL DISTRICT**  
Jacob Wismer Elementary School - Portland, OR

SCALE: NS

DATE: 3/30/2020

1 of 1

**A-TECH/NORTHWEST, INC.**  
Portland & Prineville, Oregon 503-628-2882



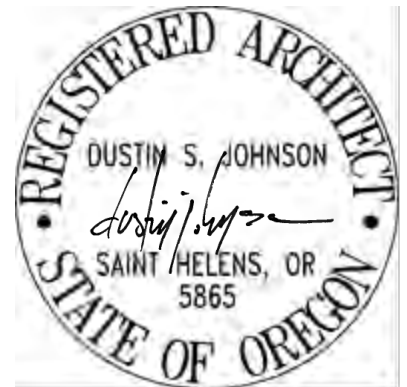
As-Built Drawing

PROJECT NUMBER:  
20054

# BSD 2021 Roofing Projects – Jacob Wismer ES

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## TECHNICAL SPECIFICATIONS



PROJECT NUMBER: 20Y082.04

BID SET: OCTOBER 28, 2020



**AIA DOCUMENT A101-2017 STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR**

- (INCORPORATED BY REFERENCE)

**AIA DOCUMENT A201-2017 GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION**

- (INCORPORATED BY REFERENCE)

**BSD TECHNICAL STANDARDS STANDARDS FOR DESIGN AND CONSTRUCTION OF ALL DISTRICT FACILITIES**

- (INCORPORATED BY REFERENCE—PLEASE SEE WEBSITE)

<https://www.beaverton.k12.or.us/departments/facilities-development/technical-standards>

**DIVISION 0 PROCUREMENT AND CONTRACTING REQUIREMENTS**

|        |                   |
|--------|-------------------|
| 000110 | Table of Contents |
| 000115 | List of Drawings  |
| 000120 | Project Team      |

**DIVISION 1 GENERAL CONDITIONS**

|        |                                          |
|--------|------------------------------------------|
| 011000 | Summary                                  |
| 012200 | Unit Prices                              |
| 012300 | Alternates                               |
| 012500 | Substitution Procedures                  |
|        | Substitution Request Form: CSI Form 1.5C |
| 013100 | Project Management And Coordination      |
| 013123 | Project Management Database (E-Builder)  |
| 013200 | Construction Progress Documentation      |
| 013300 | Submittal Procedures                     |
| 013553 | Security Procedures                      |
| 014000 | Quality Requirements                     |
| 014200 | References                               |
| 015000 | Temporary Facilities And Controls        |
| 016100 | Common Product Requirements              |
| 017300 | Execution                                |
| 017329 | Cutting And Patching                     |
| 017700 | Closeout Procedures                      |
|        | Closeout Log Template                    |
| 017823 | Operation And Maintenance Data           |
| 017839 | Project Record Documents                 |
| 017900 | Demonstration And Training               |

**DIVISION 2 EXISTING CONDITIONS (NOT USED— See APPENDIX ‘A’: ROOF INSPECTION REPORT’)****DIVISION 3 CONCRETE (NOT USED)**

Project Number: **20Y082.01**

**DIVISION 4 MASONRY (NOT USED)**

**DIVISION 5 METALS (NOT USED)**

**DIVISION 6 WOOD, PLASTICS, AND COMPOSITES**

061000 Rough Carpentry

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**

075323 Ethylene Propylene Diene Monomer (EPDM) Membrane Roofing

**DIVISION 8 OPENINGS (NOT USED)**

**DIVISION 9 FINISHES (NOT USED)**

**APPENDIX A: ROOF INSPECTION REPORT**

- By A-Tech Northwest, Inc. dated 03/26/2020

**APPENDIX B: MOISTURE SURVEY REPORT**

- By RDH Building Science dated 10/14/2020

END OF SECTION



Project Number: **20Y082.01**

## **LIST OF DRAWINGS**

CS1 COVER SHEET  
AD0.1 EXISTING CONDITIONS ROOF PLAN  
AD1.1 DEMO ROOF PLAN  
A1.1 ROOF PLAN  
A2.1 FALL PROTECTION PLAN  
A3.1 DETAILS  
  
S1.1 STRUCTURAL ROOF PLAN  
S2.1 STRUCTURAL DETAILS  
  
M1.1 ROOF PLAN-MECHANICAL  
M2.1 MECHANICAL SPECIFICATIONS  
M2.2 MECHANICAL SPECIFICATIONS

Project Number: **20Y082.01**

## **PROJECT TEAM**

### OWNER

Beaverton School District

16550 SW Merlo Rd

Beaverton, OR 97003

Contact: Megan Finch, Project Manager

E-Mail: [megan\\_finch@beaverton.k12.or.us](mailto:megan_finch@beaverton.k12.or.us)

Phone: (503) 356-4318

Contact: Angela Knotts, Project Coordinator

E-Mail: [angela\\_knotts@beaverton.k12.or.us](mailto:angela_knotts@beaverton.k12.or.us)

Phone: (503) 356-4576

### ARCHITECT/ STRUCTURAL ENGINEER

CIDA

15895 SW 72<sup>ND</sup> Ave, Suite 200

Portland, OR 97224

Contact: Dustin Johnson

E-Mail: [dustinj@cidainc.com](mailto:dustinj@cidainc.com)

Phone: (503) 226-1285

Contact: Curtis Gagner

E-Mail: [curtisg@cidainc.com](mailto:curtisg@cidainc.com)

Phone: (503) 226-1285

### MECHANICAL/ ELECTRICAL ENGINEER & COST CONSULTANT

R&W Engineering, Inc.

9615 SW Allen Blvd, Suite 107

Beaverton, OR 97005

Contact: Ed Carlisle

E-Mail: [ecarlisle@rweng.com](mailto:ecarlisle@rweng.com)

Phone: (503) 726-3322

### ROOFING CONSULTANT

RDH Building Science

5331 S Macadam Ave. #314

Portland, OR 97239

Contact: Kathleen Smith

E-mail: [ksmith@rdh.com](mailto:ksmith@rdh.com)

Phone: (503) 821-7321

Contact: Scott Mecalis

E-Mail: [smecalis@rdh.com](mailto:smecalis@rdh.com)

Phone: (503) 867-8519

### HAZARDOUS MATERIAL SURVEYOR

TRC Solutions

4105 SE International Way

Milwaukie, OR 97222

Contact: Ron Landolt

E-Mail: [rlandolt@trcsolutions.com](mailto:rlandolt@trcsolutions.com)

Phone: (503) 387-3251

Project Number: **20Y082.01**

GENERAL CONTRACTOR

TBD

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

#### B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

### 1.2 PROJECT INFORMATION

#### A. Project Identification: BSD 2021 Roofing Projects: Jacob Wismer Elementary School

1. Project Location: 5477 NW Skycrest Pkwy, Portland, OR 97229

### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

#### A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. New roofing overlay over existing build-up roofing system.

#### B. Type of Contract.

1. Project will be constructed under a single prime contract.
  - a. *Standard Form of Agreement Between Owner and Contractor AIA Document A101, 2017 Edition Modified.*
  - b. *General Conditions of the Contract for Construction AIA Document A201, 2017 Edition Modified.*

### 1.4 ACCESS TO SITE

- #### A. General:
- Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

Project Number: **20Y082.01**

- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

## 1.5 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
  - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
  - 3. Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

## 1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
  - 2. Comply with noise ordinances of the authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building and site as follows:
  - 1. Weekdays: 7:00 a.m. to 7:00 p.m (Custodian until 3:30 p.m.).
  - 2. Saturdays and Sundays: Arrange with Owner's Representative
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
  - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products, E-cigarettes/vape devices and other controlled substances on the Project site is not permitted.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Section:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

### 1.2 DEFINITIONS

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

### 1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. Schedule:
  - 1. A "Schedule of Unit Prices" is included at the end of this section.
  - 2. Include as part of each unit price, miscellaneous devices, appurtenances and similar items incidental to or required for a complete system whether or not mentioned as part of the unit price.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 Schedule of Unit Prices:

- A. New Sheet Metal Fabrications at Roof Edge Conditions
  - 1. New 24 ga. pre-finished sheet metal gutter and downspouts (Unit: Cost per lineal foot)
  - 2. New 24ga. pre-finished sheet metal coping cap (Unit: Cost per lineal foot)
- B. Roof Sheathing Replacement at Roof Overlay Areas
  - 1. Roof sheathing replacement at areas discovered during construction to be damaged or rotted. This item includes roof sheathing found to be rotted or damaged as a result of physical investigation. For the purpose of this unit price item, assume up to 3,000 square feet of sheathing to be replaced.
- C. Interior Roof Drain
  - 1. Replacement of entire roof drain assembly, including sump, drain bowl, clamp ring and strainer. Include associated cost of modifying the drain plumbing as needed. For the purpose of this unit price item, assume replacement of up to two full roof drain assemblies.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

### 1.2 DEFINITIONS

- A. Alternate: An amount proposed by the Contractor in Bid Proposal, including 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.
  - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

### 1.3 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate #1: Replace Make-Up Air Unit above kitchen (1 total). Include replacement of existing mechanical curb with new insulated mechanical curb. See mechanical drawings for full scope of work to be included with this alternate.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

### 1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

### 1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Architect to forward any substitution to BSD representative for approval prior to acceptance by the Architect.
  - 1. Substitution Request Form: Use CSI Substitution Request Form 1.5C provided at the end of this section.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Certificates and qualification data, where applicable or requested.
    - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
    - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided

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within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 fifteen days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
  - a. Requested substitution has been approved by the Owner.
  - b. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - e. Requested substitution is compatible with other portions of the Work.
  - f. Requested substitution has been coordinated with other portions of the Work.
  - g. Requested substitution provides specified warranty.
  - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed.

## PART 3 - EXECUTION (Not Used)

END OF SECTION



# 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 ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ \_\_\_\_\_

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination drawings.
  - 2. Requests for Information (RFIs).
  - 3. Project Web site.
  - 4. Project meetings.

### 1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, Consultant or Contractor seeking information from each other during construction.

### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.

6. Preinstallation conferences.
7. Project Closeout Conference.
8. Startup and adjustment of systems.
9. Project closeout activities.

#### 1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing and electrical Work.
  2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Review: Architect/Consultant will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility.

#### 1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect/Consultant will return RFIs submitted to Architect/Consultant by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

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- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to the District.
- D. Architect's Action: Architect/Consultant will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect/Consultant after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's/Consultant's action may include a request for additional information, in which case the allotted time for response will date from time of receipt of additional information.
  3. Architect's/Consultant's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect/Consultant and Owner's Representative in writing within seven days of receipt of the RFI response.
- E. On receipt of Architect's/Consultant's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect/Consultant and Owner's Representative within seven days if Contractor disagrees with response.



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- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site (e-Builder).

## 1.6 PROPOSAL REQUESTS

- A. Proposal Request Log: Contractor shall maintain a current log of all proposed requests and submit same at each project meeting and with each application for payment. Each proposal request shall have a unique number for tracking purpose. The log shall, at a minimum, show the proposal request number, date initiated, brief description, reference (i.e. RFI or supplemental instruction), estimated cost, estimated time, status, and reason for the proposal request (i.e. Unforeseen Condition/ Regulatory Requirement/ Owner Request/ E&O).

## 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner's Representative and Architect/Consultant of scheduled meeting dates and times.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner's Representative and Architect/Consultant, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
  - 1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Sustainable design requirements.

- l. Preparation of record documents.
    - m. Use of the premises and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.
    - q. Responsibility for temporary facilities and controls.
    - r. Procedures for moisture and mold control.
    - s. Procedures for disruptions and shutdowns.
    - t. Construction waste management and recycling.
    - u. Parking availability.
    - v. Office, work, and storage areas.
    - w. Equipment deliveries and priorities.
    - x. First aid.
    - y. Security.
    - z. Progress cleaning.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
  1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/ Consultant and Owner's Representative of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.

- w. Required performance results.
  - x. Protection of adjacent work.
  - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at intervals indicated in Owner/Contractor Agreement.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect/ Consultant, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Progress cleaning.
      - 10) Quality and work standards.
      - 11) Status of correction of deficient items.
      - 12) Field observations.
      - 13) Status of RFIs.
      - 14) Status of proposal requests.
      - 15) Pending changes.
      - 16) Status of Change Orders.

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- 17) Pending claims and disputes.
    - 18) Documentation of information for payment requests.
  3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Project Closeout Conference: Conduct conference prior to Substantial Completion.
  1. Attendees: Owner, Architect/ Consultant, Contractor.
  2. Agenda: Procedures for completing and archiving closeout deliverables in e-Builder;
    - a. Requirements for preparing Record Documents;
    - b. Requirements for preparing O&Ms;
    - c. Submittal of warranties;
    - d. Requirements for delivery of Maintenance stock;
    - e. Requirements for demonstration and training.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 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 and with website’s training documents uploaded to the project folder.
- 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’s Representative: Owner shall pay for and provide licenses/access for the following members of the project team.
  - 1. Lead member of Architect’s/Consultant’s design team responsible.
  - 2. Contractor’s project manager or lead member of Contractor’s project staff.
  - 3. Others as deemed appropriate by Owner’s Representative.

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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 ay 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](http://www.e-builder.net)).
  - d. Users are recommended to have a properly licensed version 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 user’s 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’S 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.

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- 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. All other communication shall be conducted in an industry standard manner.
  - 5. Submittals, contracts, meeting minutes, and other project records.
  - 6. Application for payments.
  - 7. Project closeout.
- 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 communications 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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

PART 1 - GENERAL

1.1 CONSTRUCTION PROGRESS DOCUMENTATION

- A. Progress Schedules and Reports: The Contractor, within ten calendar days after being awarded the Contract, shall prepare and submit for the information of the Owner's Representative and the Architect/Consultant a Progress Schedule in critical path management ("CPM") format satisfactory to the Owner's 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 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 the 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.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

### 1.2 QUALITY CONTROL

- A. Submit 3-week work schedule, shop drawings, product data, samples, schedule of values and record documents as follows:
  - 1. Submit to Architect/Consultant and Owner's Representative only through General Contractor.
  - 2. The General Contractor shall provide a set of submittals to the Owner's Representative for review and approval concurrent with review by the Architect and Consultant(s).

### 1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's/ Consultant's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
  - 1. Architect/Consultant will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital data files are provided for Contractor's convenience and to help expedite the submittal preparation process. Use of the digital data files is at Contractor's risk and does not release the Contractor from verifying and indicating as-built conditions which may or may not be indicated in the digital data files.
    - c. Contractor shall execute a release of Architect's/Consultant's liability for Contractor's use of the digital data files. Release form shall be provide by Architect/Consultant.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect and Consultant reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect/Consultant's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Consultant or Owner's Representative will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect/Consultant.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01).

Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/ Consultant.
  4. Include the following information on an inserted cover sheet:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Name of subcontractor.
    - h. Name of supplier.
    - i. Name of manufacturer.
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Related physical samples submitted directly.
    - n. Other necessary identification.
- F. Options: Identify options requiring selection by the Architect.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's/ Consultant's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals that are marked with approval notation from Architect's or Consultant's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

#### A. General Submittal Procedure Requirements:

1. Post electronic submittals as PDF electronic files directly to e-Builder.
  - a. Architect/Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

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2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures." All closeout submittals to be uploaded to e-Builder in format acceptable to the District.
  3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
  4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data without field-verifying as-built conditions which may or may not be indicated at part of the released digital data files.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
  3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/ Consultant will return submittal with options selected.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or

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containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect/Consultant will retain two Sample sets; remainder will be returned.

- 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Submit product schedule in the following format:

- a. PDF electronic file.

- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

- G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

- H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

1. Submit subcontract list in the following format:

- a. PDF electronic file.

- J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

- K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

- M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

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- N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Consultant and Owner's Representative.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S/ CONSULTANT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect/ Consultant will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect or Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Consultant, Owner's Representative, or authorities having jurisdiction are not limited by provisions of this Section.

### 1.2 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

### 1.3 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### 1.4 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect/Consultant and Owner's Representative with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

## 1.5 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. **Testing Agency Responsibilities:** Cooperate with Architect, Consultant, Owner's Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect/Consultant, Owner's Representative and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- F. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

#### 1.6 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner's Representative will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:
  1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect/Consultant and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect/Consultant and Owner's Representative with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected work.

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION

##### 3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

## PART 1 - GENERAL

### 1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

### 1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### 1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl1

|        |                                                                    |
|--------|--------------------------------------------------------------------|
| AA     | Aluminum Association, Inc. (The)                                   |
| AAADM  | American Association of Automatic Door Manufacturers               |
| AABC   | Associated Air Balance Council                                     |
| AAMA   | American Architectural Manufacturers Association                   |
| AASHTO | American Association of State Highway and Transportation Officials |
| AATCC  | American Association of Textile Chemists and Colorists             |
| ABAA   | Air Barrier Association of America                                 |
| ABMA   | American Bearing Manufacturers Association                         |
| ACI    | American Concrete Institute                                        |
| ACPA   | American Concrete Pipe Association                                 |
| AEIC   | Association of Edison Illuminating Companies, Inc. (The)           |
| AF&PA  | American Forest & Paper Association                                |
| AGA    | American Gas Association                                           |
| AGC    | Associated General Contractors of America (The)                    |
| AHA    | American Hardboard Association<br>(Now part of CPA)                |
| AHAM   | Association of Home Appliance Manufacturers                        |
| AI     | Asphalt Institute                                                  |
| AIA    | American Institute of Architects (The)                             |

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|          |                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------|
| AISC     | American Institute of Steel Construction                                                                      |
| AISI     | American Iron and Steel Institute                                                                             |
| AITC     | American Institute of Timber Construction                                                                     |
| ALCA     | Associated Landscape Contractors of America<br>(Now PLANET - Professional Landcare Network)                   |
| ALSC     | American Lumber Standard Committee, Incorporated                                                              |
| AMCA     | Air Movement and Control Association International, Inc.                                                      |
| ANSI     | American National Standards Institute                                                                         |
| AOSA     | Association of Official Seed Analysts, Inc.                                                                   |
| APA      | Architectural Precast Association                                                                             |
| APA      | APA - The Engineered Wood Association                                                                         |
| APA EWS  | APA - The Engineered Wood Association; Engineered Wood Systems<br>(See APA - The Engineered Wood Association) |
| API      | American Petroleum Institute                                                                                  |
| ARI      | Air-Conditioning & Refrigeration Institute                                                                    |
| ARMA     | Asphalt Roofing Manufacturers Association                                                                     |
| ASCE     | American Society of Civil Engineers                                                                           |
| ASCE/SEI | American Society of Civil Engineers/Structural Engineering Institute<br>(See ASCE)                            |
| ASHRAE   | American Society of Heating, Refrigerating and Air-Conditioning Engineers                                     |
| ASME     | ASME International<br>(American Society of Mechanical Engineers International)                                |
| ASSE     | American Society of Sanitary Engineering                                                                      |
| ASTM     | ASTM International<br>(American Society for Testing and Materials International)                              |
| AWCI     | Association of the Wall and Ceiling Industry                                                                  |
| AWCMA    | American Window Covering Manufacturers Association<br>(Now WCMA)                                              |
| AWI      | Architectural Woodwork Institute                                                                              |



|       |                                                                                                        |
|-------|--------------------------------------------------------------------------------------------------------|
| AWPA  | American Wood Protection Association<br>(Formerly: American Wood Preservers' Association)              |
| AWS   | American Welding Society                                                                               |
| AWWA  | American Water Works Association                                                                       |
| BHMA  | Builders Hardware Manufacturers Association                                                            |
| BIA   | Brick Industry Association (The)                                                                       |
| BICSI | BICSI, Inc.                                                                                            |
| BIFMA | BIFMA International<br>(Business and Institutional Furniture Manufacturer's Association International) |
| BISSC | Baking Industry Sanitation Standards Committee                                                         |
| BSD   | Beaverton School District                                                                              |
| BWF   | Badminton World Federation<br>(Formerly: IBF - International Badminton Federation)                     |
| CCC   | Carpet Cushion Council                                                                                 |
| CDA   | Copper Development Association                                                                         |
| CEA   | Canadian Electricity Association                                                                       |
| CEA   | Consumer Electronics Association                                                                       |
| CFFA  | Chemical Fabrics & Film Association, Inc.                                                              |
| CGA   | Compressed Gas Association                                                                             |
| CIMA  | Cellulose Insulation Manufacturers Association                                                         |
| CISCA | Ceilings & Interior Systems Construction Association                                                   |
| CISPI | Cast Iron Soil Pipe Institute                                                                          |
| CLFMI | Chain Link Fence Manufacturers Institute                                                               |
| CRRC  | Cool Roof Rating Council                                                                               |
| CPA   | Composite Panel Association                                                                            |
| CPPA  | Corrugated Polyethylene Pipe Association                                                               |
| CRI   | Carpet and Rug Institute (The)                                                                         |

|              |                                                                                      |
|--------------|--------------------------------------------------------------------------------------|
| CRSI         | Concrete Reinforcing Steel Institute                                                 |
| CSA          | Canadian Standards Association                                                       |
| CSA          | CSA International<br>(Formerly: IAS - International Approval Services)               |
| CSI          | Cast Stone Institute                                                                 |
| CSI          | Construction Specifications Institute (The)                                          |
| CSSB         | Cedar Shake & Shingle Bureau                                                         |
| CTI          | Cooling Technology Institute<br>(Formerly: Cooling Tower Institute)                  |
| DHI          | Door and Hardware Institute                                                          |
| EIA          | Electronic Industries Alliance                                                       |
| EIMA         | EIFS Industry Members Association                                                    |
| EJCDC        | Engineers Joint Contract Documents Committee                                         |
| EJMA         | Expansion Joint Manufacturers Association, Inc.                                      |
| ESD          | ESD Association<br>(Electrostatic Discharge Association)                             |
| ETL SEMCO    | Intertek ETL SEMCO<br>(Formerly: ITS - Intertek Testing Service NA)                  |
| FIBA         | Federation Internationale de Basketball<br>(The International Basketball Federation) |
| FIVB         | Federation Internationale de Volleyball<br>(The International Volleyball Federation) |
| FM Approvals | FM Approvals LLC                                                                     |
| FM Global    | FM Global<br>(Formerly: FMG - FM Global)                                             |
| FMRC         | Factory Mutual Research<br>(Now FM Global)                                           |
| FRSA         | Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.        |
| FSA          | Fluid Sealing Association                                                            |

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|       |                                                                       |
|-------|-----------------------------------------------------------------------|
| FSC   | Forest Stewardship Council                                            |
| GA    | Gypsum Association                                                    |
| GANA  | Glass Association of North America                                    |
| GRI   | (Part of GSI)                                                         |
| GS    | Green Seal                                                            |
| GSI   | Geosynthetic Institute                                                |
| HI    | Hydraulic Institute                                                   |
| HI    | Hydronics Institute                                                   |
| HMMA  | Hollow Metal Manufacturers Association<br>(Part of NAAMM)             |
| HPVA  | Hardwood Plywood & Veneer Association                                 |
| HPW   | H. P. White Laboratory, Inc.                                          |
| IAS   | International Approval Services<br>(Now CSA International)            |
| IBF   | International Badminton Federation<br>(Now BWF)                       |
| ICEA  | Insulated Cable Engineers Association, Inc.                           |
| ICRI  | International Concrete Repair Institute, Inc.                         |
| IEC   | International Electrotechnical Commission                             |
| IEEE  | Institute of Electrical and Electronics Engineers, Inc. (The)         |
| IESNA | Illuminating Engineering Society of North America                     |
| IEST  | Institute of Environmental Sciences and Technology                    |
| IGCC  | Insulating Glass Certification Council                                |
| IGMA  | Insulating Glass Manufacturers Alliance                               |
| ILI   | Indiana Limestone Institute of America, Inc.                          |
| ISO   | International Organization for Standardization<br>Available from ANSI |
| ISSFA | International Solid Surface Fabricators Association                   |

|       |                                                                                   |
|-------|-----------------------------------------------------------------------------------|
| ITS   | Intertek Testing Service NA<br>(Now ETL SEMCO)                                    |
| ITU   | International Telecommunication Union                                             |
| KCMA  | Kitchen Cabinet Manufacturers Association                                         |
| LMA   | Laminating Materials Association<br>(Now part of CPA)                             |
| LPI   | Lightning Protection Institute                                                    |
| MBMA  | Metal Building Manufacturers Association                                          |
| MFMA  | Maple Flooring Manufacturers Association, Inc.                                    |
| MFMA  | Metal Framing Manufacturers Association, Inc.                                     |
| MH    | Material Handling<br>(Now MHIA)                                                   |
| MHIA  | Material Handling Industry of America                                             |
| MIA   | Marble Institute of America                                                       |
| MPI   | Master Painters Institute                                                         |
| MSS   | Manufacturers Standardization Society of The Valve and Fittings Industry Inc.     |
| NAAMM | National Association of Architectural Metal Manufacturers                         |
| NACE  | NACE International<br>(National Association of Corrosion Engineers International) |
| NADCA | National Air Duct Cleaners Association                                            |
| NAGWS | National Association for Girls and Women in Sport                                 |
| NAIMA | North American Insulation Manufacturers Association                               |
| NBGQA | National Building Granite Quarries Association, Inc.                              |
| NCAA  | National Collegiate Athletic Association (The)                                    |
| NCMA  | National Concrete Masonry Association                                             |
| NCPI  | National Clay Pipe Institute                                                      |
| NCTA  | National Cable & Telecommunications Association                                   |

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|       |                                                                                                                   |
|-------|-------------------------------------------------------------------------------------------------------------------|
| NEBB  | National Environmental Balancing Bureau                                                                           |
| NECA  | National Electrical Contractors Association                                                                       |
| NeLMA | Northeastern Lumber Manufacturers' Association                                                                    |
| NEMA  | National Electrical Manufacturers Association                                                                     |
| NETA  | InterNational Electrical Testing Association                                                                      |
| NFHS  | National Federation of State High School Associations                                                             |
| NFPA  | NFPA<br>(National Fire Protection Association)                                                                    |
| NFRC  | National Fenestration Rating Council                                                                              |
| NGA   | National Glass Association                                                                                        |
| NHLA  | National Hardwood Lumber Association                                                                              |
| NLGA  | National Lumber Grades Authority                                                                                  |
| NOFMA | NOFMA: The Wood Flooring Manufacturers Association<br>(Formerly: National Oak Flooring Manufacturers Association) |
| NOMMA | National Ornamental & Miscellaneous Metals Association                                                            |
| NRCA  | National Roofing Contractors Association                                                                          |
| NRMCA | National Ready Mixed Concrete Association                                                                         |
| NSF   | NSF International<br>(National Sanitation Foundation International)                                               |
| NSSGA | National Stone, Sand & Gravel Association                                                                         |
| NTMA  | National Terrazzo & Mosaic Association, Inc. (The)                                                                |
| NTRMA | National Tile Roofing Manufacturers Association<br>(Now TRI)                                                      |
| NWWDA | National Wood Window and Door Association<br>(Now WDMA)                                                           |
| OPL   | Omega Point Laboratories, Inc.<br>(Now ITS)                                                                       |
| PCI   | Precast/Prestressed Concrete Institute                                                                            |
| PDCA  | Painting & Decorating Contractors of America                                                                      |

|          |                                                                                                                                            |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------|
| PDI      | Plumbing & Drainage Institute                                                                                                              |
| PGI      | PVC Geomembrane Institute                                                                                                                  |
| PLANET   | Professional Landcare Network<br>(Formerly: ACLA - Associated Landscape Contractors of America)                                            |
| PTI      | Post-Tensioning Institute                                                                                                                  |
| RCSC     | Research Council on Structural Connections                                                                                                 |
| RFCI     | Resilient Floor Covering Institute                                                                                                         |
| RIS      | Redwood Inspection Service                                                                                                                 |
| SAE      | SAE International                                                                                                                          |
| SDI      | Steel Deck Institute                                                                                                                       |
| SDI      | Steel Door Institute                                                                                                                       |
| SEFA     | Scientific Equipment and Furniture Association                                                                                             |
| SEI/ASCE | Structural Engineering Institute/American Society of Civil Engineers<br>(See ASCE)                                                         |
| SGCC     | Safety Glazing Certification Council                                                                                                       |
| SIA      | Security Industry Association                                                                                                              |
| SIGMA    | Sealed Insulating Glass Manufacturers Association<br>(Now IGMA)                                                                            |
| SJI      | Steel Joist Institute                                                                                                                      |
| SMA      | Screen Manufacturers Association                                                                                                           |
| SMACNA   | Sheet Metal and Air Conditioning Contractors'<br>National Association                                                                      |
| SMPTE    | Society of Motion Picture and Television Engineers                                                                                         |
| SPFA     | Spray Polyurethane Foam Alliance<br>(Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray<br>Polyurethane Foam Division) |
| SPIB     | Southern Pine Inspection Bureau (The)                                                                                                      |
| SPRI     | Single Ply Roofing Industry                                                                                                                |

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|         |                                                                                                          |
|---------|----------------------------------------------------------------------------------------------------------|
| SSINA   | Specialty Steel Industry of North America                                                                |
| SSPC    | SSPC: The Society for Protective Coatings                                                                |
| STI     | Steel Tank Institute                                                                                     |
| SWI     | Steel Window Institute                                                                                   |
| SWRI    | Sealant, Waterproofing, & Restoration Institute                                                          |
| TCA     | Tile Council of America, Inc.<br>(Now TCNA)                                                              |
| TCNA    | Tile Council of North America, Inc.                                                                      |
| TIA/EIA | Telecommunications Industry Association/Electronic Industries Alliance                                   |
| TMS     | The Masonry Society                                                                                      |
| TPI     | Truss Plate Institute, Inc.                                                                              |
| TPI     | Turfgrass Producers International                                                                        |
| TRI     | Tile Roofing Institute                                                                                   |
| UL      | Underwriters Laboratories Inc.                                                                           |
| UNI     | Uni-Bell PVC Pipe Association                                                                            |
| USAV    | USA Volleyball                                                                                           |
| USGBC   | U.S. Green Building Council                                                                              |
| USITT   | United States Institute for Theatre Technology, Inc.                                                     |
| WASTEC  | Waste Equipment Technology Association                                                                   |
| WCLIB   | West Coast Lumber Inspection Bureau                                                                      |
| WCMA    | Window Covering Manufacturers Association                                                                |
| WCSC    | Window Covering Safety Council<br>(Formerly: WCMA - Window Covering Manufacturers Association)           |
| WDMA    | Window & Door Manufacturers Association<br>(Formerly: NWWDA - National Wood Window and Door Association) |
| WI      | Woodwork Institute (Formerly: WIC - Woodwork Institute of California)                                    |
| WIC     | Woodwork Institute of California<br>(Now WI)                                                             |

WMMPA        Wood Moulding & Millwork Producers Association

WSRCA        Western States Roofing Contractors Association

WWPA        Western Wood Products Association

C.    Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl2

IAPMO       International Association of Plumbing and Mechanical Officials

ICC        International Code Council

ICC-ES      ICC Evaluation Service, Inc.

UBC        Uniform Building Code  
(See ICC)

D.    Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl3

CE        Army Corps of Engineers

CPSC       Consumer Product Safety Commission

DOC        Department of Commerce

DOD        Department of Defense

DOE        Department of Energy

EPA        Environmental Protection Agency

FAA        Federal Aviation Administration

FCC        Federal Communications Commission

FDA        Food and Drug Administration

GSA        General Services Administration

HUD        Department of Housing and Urban Development

LBL        Lawrence Berkeley National Laboratory

NCHRP      National Cooperative Highway Research Program  
(See TRB)



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|      |                                                |
|------|------------------------------------------------|
| NIST | National Institute of Standards and Technology |
| OSHA | Occupational Safety & Health Administration    |
| PBS  | Public Buildings Service<br>(See GSA)          |
| PHS  | Office of Public Health and Science            |
| RUS  | Rural Utilities Service<br>(See USDA)          |
| SD   | State Department                               |
| TRB  | Transportation Research Board                  |
| USDA | Department of Agriculture                      |
| USPS | Postal Service                                 |

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl4

|         |                                                                                                                                                                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ADAAG   | Americans with Disabilities Act (ADA)<br>Architectural Barriers Act (ABA)<br>Accessibility Guidelines for Buildings and Facilities<br>Available from U.S. Access Board                                                                                     |
| CFR     | Code of Federal Regulations<br>Available from Government Printing Office                                                                                                                                                                                   |
| DOD     | Department of Defense Military Specifications and Standards<br>Available from Department of Defense Single Stock Point                                                                                                                                     |
| DSCC    | Defense Supply Center Columbus<br>(See FS)                                                                                                                                                                                                                 |
| FED-STD | Federal Standard<br>(See FS)                                                                                                                                                                                                                               |
| FS      | Federal Specification<br>Available from Department of Defense Single Stock Point<br><br>Available from Defense Standardization Program<br><br>Available from General Services Administration<br><br>Available from National Institute of Building Sciences |

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FTMS      Federal Test Method Standard  
              (See FS)

MIL        (See MILSPEC)

MIL-STD   (See MILSPEC)

MILSPEC   Military Specification and Standards  
              Available from Department of Defense Single Stock Point

UFAS      Uniform Federal Accessibility Standards  
              Available from Access Board

F.      State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl5

CBHF      State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR      California Code of Regulations

CPUC      California Public Utilities Commission

TFS      Texas Forest Service  
            Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

### 1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect/Consultant, Owner's Representative, testing agencies, and authorities having jurisdiction. Temporary facilities required for the project include but may not be limited to:
  - 1. Sanitary Facilities
  - 2. Telephone/Fax
  - 3. Internet
- B. Water from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

### 1.4 QUALITY ASSURANCE

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

### 1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures."

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  - 1. Provide portable facilities as required for workmen. Keep facilities clean and in sanitary condition. Remove from the site upon completion of the Work.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
  - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. At a conspicuous place within the primary field office post a list of important telephone numbers, including:
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Architect's office.
    - e. Engineers' offices.
    - f. Owner's Representative's office.
    - g. Principal subcontractors' field and home offices.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- B. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- C. Temporary Enclosures: Contractor to provide Weather Mitigation Plan in the event of rain and to establish procedures for temporary protection as well as an emergency contact list, please see roofing specification 075323 for additional information. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

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- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Prohibit smoking in construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  - 3. Develop and supervise an overall fire-prevention -and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### 3.4 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  - 1. 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 to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION

## 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/Consultant and Owner's Representative.
- 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 by the Architect/Consultant or Owner's Representative.
- 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 submittal to the Architect through the Owner's Project Management Database (e-Builder).\
- 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.

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1. Consult with Architect/Consultant 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Coordination of Owner-installed products.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
  - 8. Correction of the Work.
- B. Related Sections:
  - 1. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 2. Division 01 Section "Cutting and Patching".

### 1.2 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect and Owner's Representative for the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner's Representative that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect/ Consultant according to requirements in Division 01 Section "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and as-built conditions. If discrepancies are discovered, notify Architect/ Consultant promptly.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Allow for building movement, including thermal expansion and contraction.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.6 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

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- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

### 3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

### 1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio. Notify A/E immediately and without further modification to structural elements if such compromise to structure inadvertently occurs.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Notify A/E immediately if such compromise to operational elements inadvertently occurs..

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials. Submit 3 samples for Architect and Owner approval.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

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1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

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1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
1. Substantial Completion procedures.
  2. Final completion procedures.
  3. Warranties.
  4. Final cleaning.

### 1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  2. Advise Owner's Representative of pending insurance changeover requirements.
  3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  8. Complete startup testing of systems.
  9. Submit test/adjust/balance records.
  10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  11. Advise Owner of changeover in heat and other utilities.
  12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  13. Complete final cleaning requirements, including touchup painting.
  14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
  15. Prepare Closeout Log: An electronic spreadsheet log listing all closeout deliverables required in the specifications including contractor's record drawings, warranties, shop drawings, product data, extra stock, training and O&Ms. See Sample Closeout Log provided in at the end of this section.

- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  - 2. Results of completed inspection will form the basis of requirements for final completion.

### 1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
  - 1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
  - 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 4. Submit pest-control final inspection report and warranty.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### 1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize list of spaces in a sequential order.
  - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  - 3. Submit list of incomplete items in the following format:
    - a. PDF electronic file.

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## 1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Scan warranties and bonds and assemble complete warranty and bond submittal package into individual PDF files organized by specification section.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
- m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
- o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- r. Leave Project clean and ready for occupancy.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operations and Maintenance Manual.
- B. See Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

### 1.2 SUBMITTALS

- A. Manual: Submit electronic manual in final form at least 15 days before final inspection. Architect/Consultant and Owner's Representative will return an electronic copy with comments within 15 days after final inspection.
  - 1. Correct or modify each manual to comply with Architect's comments. Submit final electronic copy of each corrected manual within 15 days of receipt of Architect's/Consultant's and Owner's Representative's comments.

## PART 2 - PRODUCTS

### 2.1 MANUAL, GENERAL

- A. Organization: Unless otherwise indicated, organize manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. The manual shall contain a title page, table of contents, and manual contents.
- B. Title Page: Include the following information:
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Name and address of Owner.
  - 4. Date of submittal.
  - 5. Name, address, and telephone number of Contractor.
  - 6. Name and address of Architect.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Arrange contents numerically by specification section.

**OPERATION INFORMATION**

- E. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.
- F. Descriptions: Include the following:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Equipment identification with serial number of each component.
  - 4. Equipment function.
  - 5. Operating characteristics.
  - 6. Limiting conditions.
  - 7. Performance curves.
  - 8. Engineering data and tests.
  - 9. Complete nomenclature and number of replacement parts.
- G. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
- H. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- I. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

**PRODUCT MAINTENANCE INFORMATION**

- J. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- K. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- L. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- M. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

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- N. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- O. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

#### SYSTEMS AND EQUIPMENT MAINTENANCE INFORMATION

- P. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- Q. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- R. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:
- S. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions that detail essential maintenance procedures:
- T. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- U. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- V. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- W. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

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- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
- E. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. See Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
- C. See Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

### 1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Submit one set of marked-up Record Prints, and the following:
      - 1) Record CAD Drawing Files and Plots: One set.
      - 2) Copies printed from Record CAD Drawing Plots: One. Plot and print each Drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one copy copies of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
  - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

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- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
  2. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Architect for resolution.
  4. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into single PDF file.
  2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
  4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

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1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

# PART 3 - EXECUTION

## 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION

PART 1 - GENERAL

1.1 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to Final Completion or acceptance, fully instruct the Owner's Designated Representative and maintenance personnel in the operation, adjustment, and maintenance of all products, equipment, and systems.
  - 1. The District reserves the right to videotape training sessions.
- B. Operating and maintenance manual shall constitute the basis of instruction.
  - 1. Review contents of manual with Owner's personnel in full detail to explain all aspects of operations and maintenance.
  - 2. Review complete heating and cooling cycles with Owner's Designated Representative. Review location of dampers, valves, and control equipment.

END OF SECTION

## SECTION 061000 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Wood blocking, cants, and nailers.
  - 5. Wood furring.
  - 6. Wood sleepers.

#### 1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. OSB: Oriented strand board.
- E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
  - 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

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1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.

## 2.3 DIMENSION LUMBER FRAMING

A. Ceiling Joists: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WWP.

B. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WWP.

C. Exposed Framing Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Species and Grade: As indicated above for load-bearing construction of same type.

## 2.4 ENGINEERED WOOD PRODUCTS

A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2600 psi (17.9 MPa for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).

B. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).

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- C. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055.
  - 1. Web Material: Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
  - 2. Structural Properties: Depths and design values not less than those indicated.
  - 3. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.
- D. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.
  - 1. Manufacturer: Provide products by same manufacturer as I-joists.
  - 2. Material: product made from any combination solid lumber, wood strands, and veneers.
  - 3. Thickness: as indicated.
  - 4. Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Cants.
  - 5. Furring.
- B. Dimension Lumber Items: No. 2 grade lumber of any of the following species:
  - 1. Hem-fir; WCLIB or WWPA.
  - 2. Douglas fir-larch; WCLIB or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
  - 1. Douglas fir-larch; No. 2 grade WCLIB or WWPA
  - 2. Hem-fir No. 2 grade: WCLIB, or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.



**2.6 FASTENERS**

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

**2.7 METAL FRAMING ANCHORS**

- A. Allowable design loads, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  - 1. Use for wood-preservative-treated lumber and where indicated.
- D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304
  - 1. Use for exterior locations and where indicated.

**2.8 MISCELLANEOUS MATERIALS**

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

**PART 3 - EXECUTION****3.1 INSTALLATION, GENERAL**

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- D. Install metal framing anchors to comply with manufacturer's written instructions.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - 2. ICC-ES evaluation report for fastener.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
  - 1. Comply with indicated fastener patterns where applicable.

2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### 3.3 INSTALLATION OF WOOD FURRING

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring vertically at 24 inches (610 mm) o.c.

### 3.4 INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

- A. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.5 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

## SECTION 075323 – EPDM MEMBRANE ROOFING AND RELATED SHEET METAL

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Mechanically attached EPDM membrane roofing system.
- B. High density polyiso cover board.
- C. Sheet Metal Flashing and Trim:
  - 1. Formed roof-drainage sheet metal fabrications.
  - 2. Formed low-slope roof sheet metal flashings.
  - 3. Formed wall sheet metal fabrications.
  - 4. Formed equipment support flashings.
  - 5. Sheet metal counter flashing.
- D. Miscellaneous materials.
- E. Preparation of existing roofing system for new recover application.

#### 1.2 REFERENCES

- A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms used in this Section:
  - 1. ASTM D 1079 “Standard Terminology Relating to Roofing and Waterproofing.”
  - 2. Glossary of NRCA's "The NRCA Roofing Manual."
  - 3. Roof Consultants Institute “Glossary of Roofing Terms.”
- B. Sheet Metal Terminology and Techniques: SMACNA “Architectural Sheet Metal Manual.”

#### 1.3 DESIGN CRITERIA

- A. General: Installed roofing membrane systems to remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials to be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Installer to comply with current code requirements based on to.
- D. Wind Uplift Performance: Roofing system to be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Materials to be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

#### 1.4 SUBMITTALS

##### A. Moisture Mitigation Plan Submittal:

- 1. Contractor shall prepare and submit a 3-part moisture mitigation plan to address potential inclement weather and for District and Architect approval prior to commencement of work. The moisture mitigation plan shall include the following:
  - 2. Part 1: Prevention
    - a. Contractor's protocol for obtaining and reviewing weather forecast during construction and disseminating forecasted weather information and concerns to the Project Team. Include weather forecast source, intervals at which the forecast will be reviewed and the Contractor's method for disseminating forecasted weather-related impacts or concerns to the Project Team.
    - b. Contractor's protocol for weatherizing building at end of each work day
      - 1) Include a roof plan showing areas where temporary weatherization are to be employed with detailed information of materials and techniques used to achieve temporary weatherization. Provide drawing details as needed to clarify intent and reference details on plan. If re-roof is to be phased, submit requested roof plan for each phase
      - 2) Provide a list of key members of the Construction team involved with end-of-day weatherization and their associated roles and responsibilities (e.g., Those responsible for performing the work, those responsible for overseeing work being performed, those responsible for a quality control check after work is completed, etc...)
    - c. Provide list of equipment and where it is to be stored on-site for full project duration and for the sole purpose of deploying during a wet weather emergency to help minimize immediate wet weather affects to unprotected surfaces and affected interior areas.
    - d. Contractor's Action Plan (To be posted in job trailer or other District-approved location): Provide an organized and cohesive Action Plan for addressing wet weather intrusion. A separate Action Plan shall be provided for each of two scenarios:
      - 1) Scenario A: Wet weather is encountered during the workday with appointed staff available to respond immediately.
      - 2) Scenario B: Wet weather is encountered during off-work hours with few or no appointed construction staff on site.

- 3) For each of the above scenarios, include in the Action Plan (at a minimum) the following:
    - a) Response Team: Appoint a wet weather Response Team capable of adequately implementing contractor's Action Plan. This team shall consist of selected Contractor's staff and those of subcontractors as needed at Contractor's discretion. In addition, the District will provide a list of District and School staff to be included as part of the Response Team. Provide a list for each member of the Response Team and include emergency contact information for each, including name, role, phone number and e-mail address. Include in this list and identify at least one member of Contractor's appointed Response Team who can be reached on a 24-hour, seven days-per-week basis.
    - b) Stakeholder Contact List: The District will provide a list of District stakeholders to be contacted in the event of wet weather intrusion into the building for Contractor's integration with the Action Plan.
    - c) Location of dehumidifying equipment, drip buckets, absorbing blankets, moisture absorbing media, etc. to be employed if unprotected exterior surfaces are exposed to moisture and/or if moisture has penetrated the building envelope into the building's interior. Include instructions for locating and operating equipment if required. Refer to Item Part 1.c above for Contractor's list of equipment and materials to be stored on-site.
    - d) Sequence of Operations: Develop a Sequence of Operations for employing the Action Plan, including prioritizing the individuals to be notified upon implementation of the Action Plan and steps required to ensure moisture mitigation measures' effectiveness throughout the course of the wet weather event. As part of this sequence of operations identify the source and contact information for those responsible in supplying additional moisture mitigation equipment and materials if needed to address significant or prolonged wet weather event.
  - e. Contractor's method for educating Contractor and Subcontractor staff of Moisture Mitigation Plan, including Action Plan, and gaging such staff's preparedness to execute the Contractor's Action Plan.
3. Part 2: Immediate Response
    - a. Provide written protocol for implementing Action Plan for both scenarios identified above.
  4. Part 3: Moisture and Mold Mitigation
    - a. Identify Contractor's protocol for quantifying wet weather related impact to exposed exterior surfaces and interior spaces and how Contractor intends to disseminate this information to The District and Architect. Include description of technologies to be employed for moisture detection in concealed and unconcealed locations. Initial verbal notification to the Owner and Architect shall take place within 24 hours of a water intrusion event.

- b. Identify measures to be taken after immediate wet weather event to ensure continued moisture and mold mitigation response. Include Contractor's protocol for drying and/or cleaning of school assets impacted by wet weather, including electronics, books, classroom and office furniture, etc.
  - c. Describe the conditions under which Contractor-provided moisture and mold mitigation equipment and materials/supplies would be disengaged following a wet weather intrusion.
  - d. Provide written confirmation that Contractor intends to work collaboratively with and support an Owner or Architect-contracted industrial hygienist or other moisture and mold mitigation expert. Such subcontractor may be hired at Owner's discretion to help quantify the locations and effects of wet weather related impacts for Contractor remediation.
  - e. Outline Contractor's protocol for wet weather-related clean up.
- B. Product Data: Manufacturer's data sheets for each product to be provided.
- C. Roof Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:
  - 1. Base flashings, cants, and membrane terminations.
  - 2. Tapered insulation, including slopes.
  - 3. Crickets, saddles, and tapered edge strips, including slopes.
  - 4. Insulation fastening patterns.
- D. Tapered Insulation – Shop Drawings: Provide comprehensive panel layout of roof plans and sections as required to identify slopes in regard to hips, valley's, ridges and to all drain locations. Identify thickness of insulation in relation to all applicable existing conditions to include curb mounted equipment, parapet heights, door and structure elevation impacts, potential obstructions and ponding issues.
- E. Sheet Metal Detail Drawings:
  - 1. Include plans, elevations, sections and attachment details.
  - 2. Distinguish between shop and field assembly work.
  - 3. Include identification of finish for each item.
  - 4. Include pattern of seams and details of termination points, expansion joints and expansion joint covers, direction of expansion, roof penetration flashing, and connections to adjoining work.
- F. Verification Samples: Provide for each product specified.
- G. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- H. Maintenance Data: Provide for all products.
- I. Warranty: Provide manufacturer's current warranty specimen.

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- J. Prior to roofing system installation, roofing sub-contractor to provide a copy of the Warranty Application Confirmation document issued by manufacturer indicating that the project has been reviewed for eligibility to receive the specified warranty and registered.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's warranty with a minimum of five years of experience with work of this type.
- B. Manufacturer Qualifications: Qualified manufacturer that has previous applications for roofing system identical to that used for this Project with a minimum of 10 years of experience providing roofing systems of this type.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E329.
- D. Moisture Survey (Re-cover Roof Areas Only):
  - 1. Submit prior to installation, results of the non-destructive moisture survey test results as performed and completed by RDH Building Science Inc. Moisture Survey to utilize both of the following scanning processes:
    - a. Infrared Thermography Scanning.
    - b. Impedance Scanning.
- E. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system to be labeled by the single source roofing manufacturer issuing the warranty.
- F. Fire-Test-Response Characteristics: Roofing materials to comply with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.



1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer's 25-year total system warranty, No Dollar Limit Roofing System Warranty.
  - 1. Single-source special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
- B. Installer's Warranty: Submit roofing Installer's warranty for the following warranty period:
  - 1. Warranty Period: 2-years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: Johns Manville
- B. Firestone
- C. Carlisle

2.2 ETHYLENE PROPYLENE DIENE MONOMER ROOFING MEMBRANE - EPDM

- A. Scrim or fabric internally reinforced uniform, flexible sheet made from Ethylene Propylene Diene Monomer, ASTM D 4637, Type II.
  - 1. Thickness (nominal): 75 mils
  - 2. Exposed Face Color: Black.
  - 3. Factory Inseam Tape: 6-inch wide minimum, butyl splice tape with release film.

2.3 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  - 1. Liquid-type auxiliary materials to meet VOC limits of Authorities Having Jurisdiction.

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- B. Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.
- C. Primer Material: Manufacturer's standard synthetic-rubber polymer primer.
- D. Liquid Applied Flashing: Manufacturer's single ply liquid and fabric reinforced flashing system created with a fleece polyester scrim and a two-component polyurethane based liquid applied flashing material, consisting of a liquid resin and a curing agent.
- E. Liquid Applied Flashing Primer: Manufacturer's single ply liquid flashing primer.
- F. Seaming Material: Manufacturer's standard 6-inch-wide minimum, butyl splice tape with release film.
- G. Sealing Strip: Manufacturer's standard 6-inch, 9-inch, or 12-inch wide, 45 mil thick minimum, cured EPDM with factory-laminated, self-adhering seam tape.
- H. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
  - 1. Serviceable Installation Ambient Air Temperature: 25°F and rising.
- I. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.
- J. Membrane Battens: Manufacturer's standard polymer or aluminum-zinc-alloy-coated steel sheet, pre-punched.
- K. Membrane Fasteners and Plates: Factory-coated steel fasteners and galvalume coated steel plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening EPDM membrane to substrate, and acceptable to membrane roofing system manufacturer.
- L. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, termination reglets, T-joint cover, cover strips, sealants and other accessories.

## 2.4 HIGH-DENSITY POLYISO COVER BOARD

- A. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs. of compressive strength.
  - 1. Thickness: 1/2 inch.
  - 2. R-value: 2.5.

## 2.5 TAPERED INSULATION AND/OR CRICKETING MATERIALS

- A. Tapered Insulation and/or Crickets Materials – Where Required: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated on Drawings.

**2.6 INSULATION ACCESSORIES**

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer.
- D. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate, where/if required.
- E. Wood Nailer Strips.

**2.7 EDGE METAL COMPONENTS**

- A. Coping Metal System at Parapet Wall Conditions: Provide manufacturer's factory fabricated metal coping consisting of anchor bar and a snap-on cap components. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit warranty.
- B. All exposed sheet metal flashing to be minimum 24 gauge with Kynar 500 or Hylar 5000. Match existing colors.
  - 1. Custom colors may be required to match existing palette. Shop applied Kynar 500 or Hylar 5000 required; Field painting not allowed.
- C. Drip & Rake Edge Metal Components: Provide drip and rake edge components where required, including at gutter drip edge conditions. Drip and rake edge components to include a continuous cleat on the outside exterior edge.
- D. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

**2.8 WALKWAYS**

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer.

**2.9 MISCELLANEOUS MATERIALS**

- A. General: Provide materials and types of fasteners, solder, clinch lock, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

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- A. Roof Drain Strainer Cover: Replace damaged roof drain strainer covers. Replacement covers to be cast iron only.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  - 1. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
  - 2. Fasteners for Zinc Coated (galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.
- C. Solder - For Stainless Steel: ASTM B32, Grade Sn96, with acid flux of type recommended by stainless steel sheet manufacturer.
- D. Butyl Sealant Tape: 100 percent solids, asbestos free, butyl sealant tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch (13 mm) wide and 1/8 inch (3 mm) thick.
  - 1. Manufacturer: Schnee Morehead, Inc.; SM5227 Tacky Tape Sealant.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION GENERAL

- A. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
- B. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses and elevation height of insulation and/or cover board materials.

#### 3.2 RECOVER PREPARATION: ROOF “A” MECHANICALLY ATTACHED

- A. Overall Roof Plan and Key Plan: Refer to Drawing, including Key Plan and Overall Roof Plan, for identification of roof related work that falls under this specification.
- B. Existing BUR Roofing System to Remain in Place: The existing roofing system is to remain in place. Existing Roof Core Results: Existing roof system consists of one (1) Tremco BUR roof system w/pea-gravel and insulation over plywood roof deck substrate. Maximum thickness is approximately 5”.
- C. Existing Roof Preparation: At all existing roof areas, power broom and remove any loose pea-gravel materials. Using a spud-bar remove any high-spots and make the existing roof substrate relatively smooth prior to the installation of the new cover board materials. Prepare existing roof according to roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer, and requirements in this Section.
- D. Disable Existing Roofing System: Disable existing roof membrane system per manufacturer's written instructions and requirements.

- E. Existing Roof Base Flashings: Tear out, remove, and discard of all existing roof base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of the new cover board and roof membrane system.
- F. Existing Roof System Wet or Damaged Materials: Remove and replace with new any wet and/or compromised existing materials, including any materials identified with moisture per the roof moisture survey results. New infill materials to match the elevation height of the existing roofing system.
- G. Abandoned Equipment and/or Penetrations: Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations. Where/if necessary to infill, install new plywood roof deck sheathing. New sheathing to match existing.
- H. Existing Equipment Curbs: Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
  - 1. Modify curbs as required to provide a minimum 8-inch base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
  - 2. Secure top of flashing and install new metal counterflashing prior to re-installation of unit.
- I. Remove Debris Prior to New Roof Installation: Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to new roofing installation and in accordance with roofing system manufacturer's written instructions. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove all debris from roof surface prior to new roof installation. Demolished roof system materials may not be stored on the roof surface.
- J. Unsatisfactory Conditions: Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 TAPERED CRICKET INSULATION INSTALLATION

- A. Protection: Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Tapered Insulation and/or Tapered Cricketing Materials: Where defined on the Drawings, install tapered insulation and/or tapered cricketing materials under area of roofing to conform to slopes indicated. Materials are initially loose-laid into position.

### 3.4 COVER BOARD INSTALLATION

- A. Protection: Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.

- C. 1/2-inch HD Polyiso Cover Board – Mechanically Fastened: Mechanically attach cover board using the Insulation Fasteners and Plates at a fastening density of 5 fasteners and plates per 4' x 8' panel at field/perimeter/corner locations.
- D. Staggered Joints Cover Board: Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch with cover board.
  - 1. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations.
- E. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

### 3.5 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
- B. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
  - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.
  - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
  - 3. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.6 MECHANICALLY FASTENED EPDM ROOF MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing in accordance with roofing system manufacturer's written instructions.
  - 1. Unroll roofing membrane and allow to relax before installing.
  - 2. Install sheet in accordance with roofing system manufacturer's written instructions.
- B. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- D. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- E. Tape to Standard Mechanically Attached Sheet Installation: Align membrane for appropriate overlap, clean and prime non-taped face of splice area, remove release liners and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation.

1. Align primary sheet with perforated seam tape up.
  2. Remove center strip of release liner to expose adhesive tape.
  3. Install Batten Bar over exposed adhesive and fasten to deck through predrilled holes at 12-inches on center.
  4. Align top sheet over fastened lower sheet as required to expose 1/4-inch of lower tape.
  5. Remove release liners in tandem, and roll seam with hard rubber roller.
  6. Roll across the seam at a 45-degree angle with a hard rubber roller using maximum hand pressure.
- F. Perimeter and Corner Membrane Enhancements: Perimeter and corner membrane enhancements are required at all exposed roof edge perimeters and corners, and where roof elevation heights are 10-feet or more above adjacent roof elevation heights.
1. Formulas for determining dimensions of perimeters and corners are as follows: Use 10% of the lesser plan dimension, or 40% of the roof elevation height, whichever is the lesser.
  2. Use EPDM 10-inch wide Reinforced Perimeter Strip (RPS) for securing the roof membrane from beneath and for creating perimeter and corner enhancements.
- G. At drains, spread sealant or mastic bed over deck drain flange and securely seal roofing membrane in place with clamping ring.

### 3.7 MEMBRANE BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates in accordance with membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### 3.8 DRIP AND RAKE EDGE FLASHINGS:

- A. Drip and Rake Edge Metal Flashings: At drip and rake edge conditions, including where gutter conditions exist, install new drip and rake edge metal flashings where required.
- B. Specified finishes will be required to match existing adjacent assembly colors as identified on Drawings.
- C. Drip and rake edge materials to incorporate a continuous cleat installed on the outside vertical face.

Project Number: **20Y082.01**

- D. Flash in and make watertight using 6-inch wide EPDM Sealing Strip.
- E. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

### 3.9 COPING METAL AT PARAPET WALL CONDITIONS:

- A. At parapet wall conditions where coping metal is required, install new coping metal materials.
- B. Specified finishes will be required to match existing adjacent assembly colors as identified on Drawings.
- C. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

### 3.10 WALKWAY PAD INSTALLATION

- A. Self-Adhering Walkway Pads: Install self-adhering walkway pad products at locations indicated on Architectural Roof Plan Pages. EPDM roofing membrane is to first be primed with Tape Primer prior to adhering walkway materials in accordance with manufacturer's written instructions.

### 3.11 SPECIAL CONDITIONS AT COVERED PLAY AREA: ROOF "B" FULLY-ADHEARED

- A. Fastener Penetration Not Permitted at open and exposed Play Area Roofs: Fastener penetration through the plywood roof deck substrate is not permitted at exposed Covered Play Area Roofs.
- B. Roof Deck Substrate: Plywood roof deck substrate.
- C. Existing BUR Roofing System to be Removed: At Play Area Roofs, the existing BUR roofing system is to be completely removed down to the wood roof deck substrate. Existing base flashings to be removed, and curb and wall substrates properly prepared for new membrane base flashing materials. Note: Existing roof consists of one (1) Tremco BUR roof system w/pea-gravel and wood fiber cover board over plywood roof deck substrate. Maximum thickness is approximately 1-inch.
- D. Wood Nailers: 1/2-inch thick wood nailers are required at all drip and rake edge conditions. Where existing materials are in poor condition or do not currently exist, install new wood nailer materials.
- E. New 1/2-inch HD Polyiso Cover Board – Adhered Direct to Wood Deck with Two-Part Urethane Insulation Adhesive: Adhere cover board directly to wood roof deck substrate using Two-Part Urethane Insulation Adhesive at a bead spacing density of 12/6/4 inches on center at field/perimeter/corner locations. Note: Cover board materials to butt into, not over, drip and rake edge wood nailer materials.
- F. EPDM R 75-mil FIT SYSTEMS – Adhered: Adhere EPDM 75-mil thick membrane over the previously installed cover board materials. Membrane to be adhered with Membrane Bonding Adhesive – Solvent Based.



Project Number: **20Y082.01**

- G. EPDM R 75-mil Membrane Base Flashings at Curb & Wall Conditions – Adhered: Proceed to adhere new EPDM 75-mil membrane base flashings at all curb and wall conditions. Membrane to be adhered with Membrane Bonding Adhesive – Solvent Based.
- H. Drip, Rake Edge, and/or Coping Metal Materials – Where Required: Install new Drip Edge, Rake Edge, and/or Coping Metal flashing materials where required. Edge metal flashings to incorporate a continuous cleat on the outside vertical face. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

### 3.12 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.
  - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- B. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

### 3.13 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075323



**TECH/NORTHWEST, INC.**

ROOF CONSULTING, MOISTURE TESTING & ANALYSIS

# **ROOF INSPECTION REPORT**

*(Limited Visual Inspection)*

*Conducted For:*

**BEAVERTON SCHOOL DISTRICT**

Beaverton, Oregon

*Facility Inspected:*

**Elmonica Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary**

**Project Number: 20054**

**March 16, 2020**



## ROOF INSPECTION REPORT

(Limited – Visual)

**Inspection Date:** March 16, 2020  
**Project #:** 20054

**Inspection #:** V-01  
**Report Date:** 3/26/20

**Company:** BEAVERTON SCHOOL DISTRICT  
16550 SW Merlo Road  
Beaverton, OR 97003-5152

**Attn:** Megan Finch  
Project Manager  
503-356-4587  
[Megan\\_Finch@beaverton.k12.or.us](mailto:Megan_Finch@beaverton.k12.or.us)

**Inspected Facility:** Elmonico Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary

**Present at Inspection:** Megan Finch..... Beaverton School District  
Patrick Schmautz..... A-Tech/Northwest, Inc.  
Doug Coddington..... A-Tech/Northwest, Inc.

### PART I - DISCUSSION

#### **A. PURPOSE:**

1. The purpose of the inspection is to review the existing condition of the roofs at the five (5) schools.
  - a. The available history of the building is minimal. This report is based on the information supplied and this visual inspection.
  - b. One (1) core sample was cut at each school to determine the general roof construction / component data.
2. The following is a summary review of the results of this inspection.

#### **B. GENERAL ROOF/BUILDING INFORMATION:** (Refer to as-built drawings for Roof ID's)

1. Elmonica Elementary School – Modular Building
  - a. Built-up Roofs (Roofs I-DD):
    - (1) Roof Type:..... Pea Gravel Built-up Roof
    - (2) Manufacturer:..... Tremco
    - (3) Insulation:..... 2" Fiberboard (R Value 5 approx.)
    - (4) Deck:..... Plywood
    - (5) Age: ..... 2003 (17 years)
    - (6) Warranty: ..... Unknown
    - (7) Contractor: ..... Unknown
    - (8) General Condition: ..... Fair

2. Errol Hassell Elementary School – Modular Building

a. Built-up Roofs (Roofs I-V):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... Reported to be 2001 or 2009 (*11 or 19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

3. Hiteon Elementary School

a. Built-up Roofs (Roofs A-L):

- (1) Roof Type:..... Pea Gravel Built-up Roof (*Roof-over-roof*)
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... ½" Fiberboard Top Roof (*R Value 1.4 approx.*)  
¾" Perlite Bottom Roof (*R-Value 2 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2004 (*16 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

4. Montclair Elementary School

a. Built-up Roofs (Roofs A-H):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2009 (*11 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

5. Jacob Wismer Elementary School

a. Built-up Roofs (Roofs A-I):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2001 (*19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

### **C. INTERIOR LEAKAGE:**

1. Elmonica Elementary School:
  - a. No current interior leakage reported. Previous interior leakage reported at equipment at a few locations.
2. Errol Hassell Elementary School:
  - a. Current interior leakage at repair area at northeast section of the building. Previous interior leakage reported at a few pipes in the roof field.
3. Hiteon Elementary School:
  - a. No current interior leakage reported.
4. Montclair Elementary School:
  - a. Current interior leakage reported at several locations.
5. Jacob Wismer Elementary School:
  - a. Current interior leakage reported along parapet at southwest section of the building and at west section of the building.

## **PART II - RE-ROOF OPTIONS**

### **A. Single-ply Roof System Types Recommended:** *(in the following order)*

1. Mechanically attached TPO *(minimum 60 mil).*
2. Fully adhered TPO *(minimum 60 mil).*
3. Mechanically attached EPDM *(minimum 60 mil).*
4. Fully adhered EPDM *(minimum 60 mil).*

### **B. Coating:**

1. Coating is **not** recommended for these roofs due to gravel and condition of the existing roofs.

## **PART III – BUDGET ESTIMATE**

### **A. Remove and Replace:**

- |                                           |                                    |
|-------------------------------------------|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 500,000.00 to \$ 550,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 300,000.00 to \$ 350,000.00     |
| 3. Hiteon Elementary School: .....        | \$ 1,260,000.00 to \$ 1,550,000.00 |
| 4. Montclair Elementary School: .....     | \$ 1,100,000.00 to \$ 1,350,000.00 |
| 5. Jacob Wismer Elementary School: .....  | \$ 1,300,000.00 to \$ 1,600,000.00 |

### **B. Recover:**

- |                                           |                                    |
|-------------------------------------------|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 460,000.00 to \$ 490,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 270,000.00 to \$ 290,000.00     |
| 3. Hiteon Elementary School: .....        | n/a <i>(roof-over-roof)</i>        |
| 4. Montclair Elementary School: .....     | \$ 850,000.00 to \$ 1,000,000.00   |
| 5. Jacob Wismer Elementary School: .....  | \$ 1,000,000.00 to \$ 1,200,000.00 |



If you have any questions concerning this inspection and/or the report, please contact our office.  
The opportunity to submit this information is appreciated.

Respectfully submitted,

**A-Tech/Northwest, Inc.**

*Doug Coddington* (electronic)

Doug Coddington, RC/  
Vice President

Attachment: Photo Section  
As-Built Drawings

Copy to: Master Files

**- End of Report -**





**EE. 1.01 – View to south of the front elevation of Elmonica Elementary school.**



**EE. 1.02 – View to northeast of roof top equipment at the north section of roof.**





**EE. 1.03 – View of typical roof drain & overflow scupper with previous repairs starting to fail.**



**EE. 1.04 – View to the south of the upper section of the roof.**





**EE. 1.05 – View to the west of the north section of the roof.**



**EHE. 1.01 – View to south of the front elevation of Errol Hassell Elementary school.**





**EHE. 1.02 – View to the west of the north section of the roof.**



**EHE. 1.03 – View of repair at current interior leakage area at northeast section of the roof.**





**EHE. 1.04 – View of void in the cap of penetration flashing at northeast section of roof.**



**EHE. 1.05 – View of typical roof drain scupper with splits and coating deterioration.**





**EHE. 1.06 – View to northwest of the upper roof areas.**



**HE. 1.01 – View to west of the front elevation of Hiteon Elementary school.**



**HE. 1.02 – View to west at the west section of the roof.**



**HE. 1.03 – View to the west of the southeast section of roof.**





**HE. 1.04 – View of typical roof drain and overflow drain at the east section of the roof.**



**HE. 1.05 – View of typical roof drain and overflow scupper at the northwest section of the roof.**





**HE. 1.06 – View to the west of coated roof system at the covered playground section of roof.**



**ME. 1.01 – View to south of front elevation of Montclair Elementary school.**





**ME. 1.02 – View to east at southwest section of the roof with ponding water and moss build-up.**



**ME. 1.03 – View of typical roof drain and overflow drain with evidence ponding water and moss build-up at the east section of the roof.**





**ME. 1.04 – View to the east at the north section of the roof.**



**ME. 1.05 – View of typical repairs at the east section of the roof.**





**ME. 1.06 – View to west with ponding water and moss build-up along south section of roof.**



**ME. 1.07 – View to the north of northwest roof with evidence of moss build-up.**



**JWE. 1.01– View to north of the front elevation of Jacob Wismer Elementary school.**



**JWE. 1.02– View to north of the southwest section of roof.**





**JWE. 1.03– View of typical wall metal and coping flashing at the southwest section of roof, area has had previous leaks.**



**JWE. 1.04– View of typical roof drain and overflow drain at the west section of the roof.**





**JWE. 1.05– View to the north at the northwest section of roof.**



**JWE. 1.06 – View of fiberglass exposed in membrane at large roof top unit at the northwest section of the roof.**



**JWE. 1.07– View of moss and organic debris on roof at the southeast section of roof area.**

**- End of Photo Section -**

17387 01 25-17 Central SD - Central High School VS - (6) Photo

← SW Lisa Ct →

Roof KK

Roof JJ

Parking

Parking

SW 170th Ave

Main Entrance

Roof E

Roof F

Roof H

Roof T

Roof I

Roof J

Roof K

Roof U

Roof V

Roof L

Roof S

Roof W

Roof M

Roof R

Roof X

Roof N

Roof Q

Roof Y

Roof O

Roof P

Roof Z

Roof BB

Roof AA

Roof CC

Roof DD

Roof B

Roof A

Roof D

Roof C

Roof II

Play ground

Roof EE

Roof FF

Roof HH

Roof GG

Single-ply  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof A: | 26,654 sf |
| Roof C: | 7,470 sf  |
| Roof D: | 5,550 sf  |
| Roof E: | 3,891 sf  |
| Roof F: | 559 sf    |
| Roof G: | 673 sf    |
| Roof H: | 4,884 sf  |
| Total:  | 49,681 sf |

Gravel  
ROOF AREA SQ.FT.  
( Approximate )

|          |           |
|----------|-----------|
| Roof B:  | 1,251 sf  |
| Roof I:  | 346 sf    |
| Roof J:  | 298 sf    |
| Roof K:  | 298 sf    |
| Roof L:  | 550 sf    |
| Roof M:  | 509 sf    |
| Roof N:  | 509 sf    |
| Roof O:  | 448 sf    |
| Roof P:  | 396 sf    |
| Roof Q:  | 450 sf    |
| Roof R:  | 450 sf    |
| Roof S:  | 450 sf    |
| Roof T:  | 713 sf    |
| Roof U:  | 374 sf    |
| Roof V:  | 340 sf    |
| Roof W:  | 499 sf    |
| Roof X:  | 478 sf    |
| Roof Y:  | 478 sf    |
| Roof Z:  | 421 sf    |
| Roof AA: | 477 sf    |
| Roof BB: | 477 sf    |
| Roof CC: | 495 sf    |
| Roof DD: | 495 sf    |
| Total:   | 10,828 sf |

Comp Shingle  
ROOF AREA SQ.FT.  
( Approximate )

|          |           |
|----------|-----------|
| Roof EE: | 2,076 sf  |
| Roof FF: | 2,110 sf  |
| Roof GG: | 1,979 sf  |
| Roof HH: | 1,934 sf  |
| Roof II: | 2,074 sf  |
| Roof JJ: | 1,034 sf  |
| Roof KK: | 1,026 sf  |
| Total:   | 12,233 sf |

Roof Total: 72,742 sf

Elmonica Elementary School  
16950 SW Lisa Ct  
Beaverton, OR



**BEAVERTON SCHOOL DISTRICT**  
**Elmonica Elementary School - Beaverton, OR**

SCALE: NTS

1 of 1

DRAWN BY: D.V.G.

DATE: 3/30/2020

REVISED:

**A-TECH/NORTHWEST, INC.**  
Portland & Prineville, Oregon 503-628-2882



As-Built Drawing

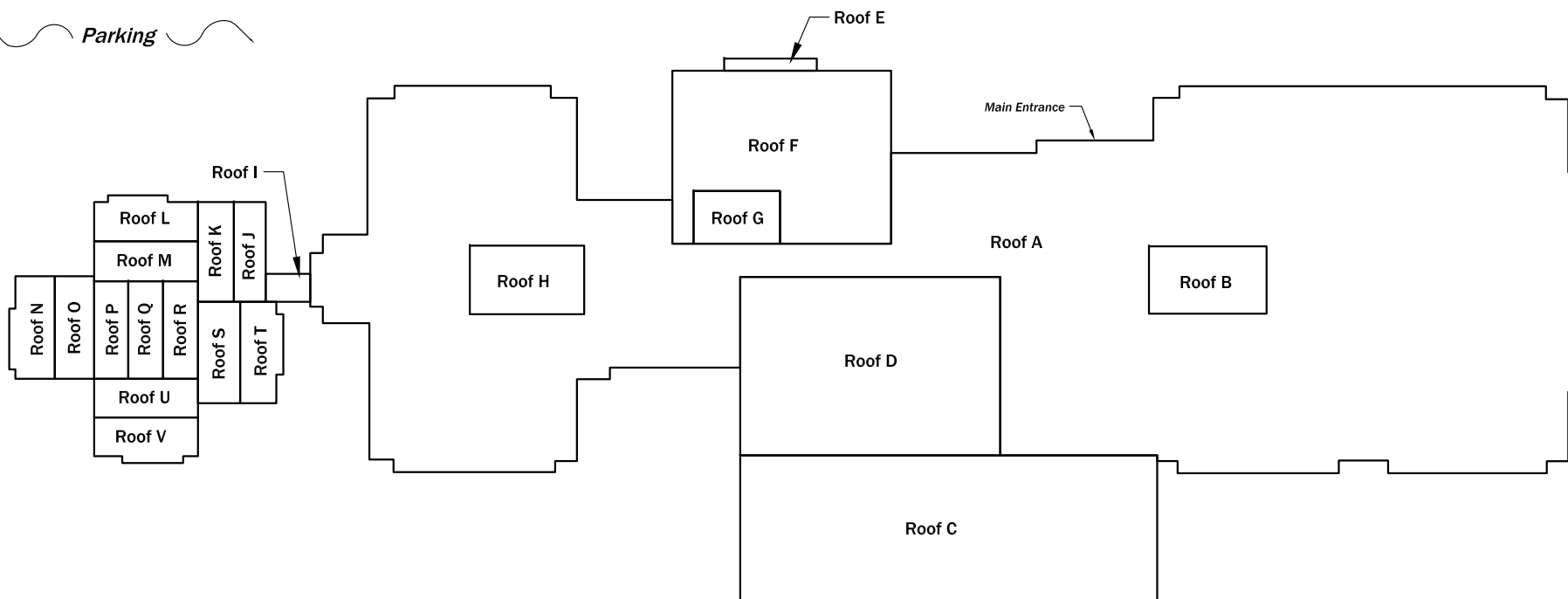
PROJECT NUMBER:  
20054



SW Bany Rd

Parking

Parking



Play ground

**Single-ply  
ROOF AREA SQ.FT.  
(Approximate)**

|               |                  |
|---------------|------------------|
| Roof A:       | 37,808 sf        |
| Roof B:       | 932 sf           |
| Roof C:       | 7,178 sf         |
| Roof D:       | 5,462 sf         |
| Roof E:       | 133 sf           |
| Roof F:       | 3,919 sf         |
| Roof G:       | 537 sf           |
| Roof H:       | 924 sf           |
| <b>Total:</b> | <b>56,893 sf</b> |

**Gravel  
ROOF AREA SQ.FT.  
(Approximate)**

|               |                 |
|---------------|-----------------|
| Roof I:       | 147 sf          |
| Roof J:       | 375 sf          |
| Roof K:       | 422 sf          |
| Roof L:       | 527 sf          |
| Roof M:       | 487 sf          |
| Roof N:       | 519 sf          |
| Roof O:       | 475 sf          |
| Roof P:       | 391 sf          |
| Roof Q:       | 400 sf          |
| Roof R:       | 400 sf          |
| Roof S:       | 505 sf          |
| Roof T:       | 481 sf          |
| Roof U:       | 473 sf          |
| Roof V:       | 522 sf          |
| <b>Total:</b> | <b>6,124 sf</b> |

**Roof Total: 63,017 sf**

**Errol Hassell Elementary School**  
18100 SW Bany Rd  
Beaverton, OR

**BEAVERTON SCHOOL DISTRICT**  
**Errol Hassell Elementary School - Beaverton, OR**

|                 |        |                  |
|-----------------|--------|------------------|
| SCALE: NTS      | 1 of 1 | DRAWN BY: D.V.G. |
| DATE: 3/30/2020 |        | REVISED:         |

**A-TECH/NORTHWEST, INC.**  
Portland & Prineville, Oregon 503-628-2882



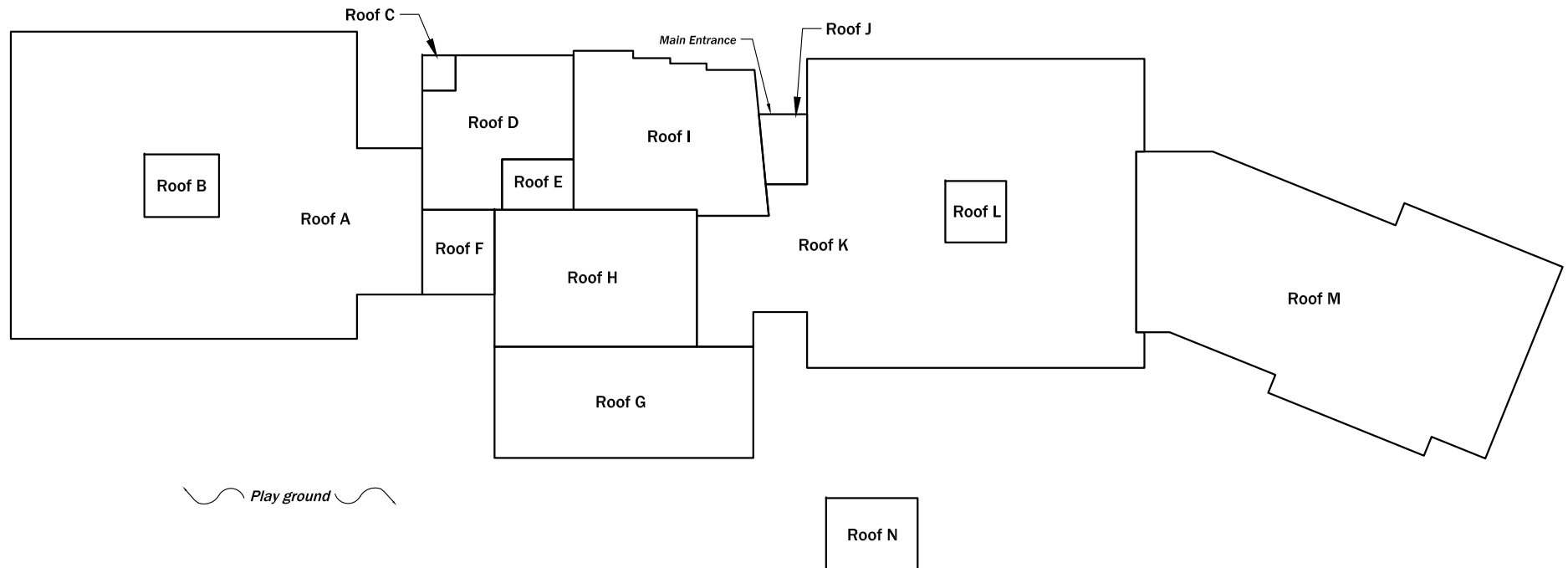
As-Built Drawing

PROJECT NUMBER:  
20054





Parking



Gravel  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof A: | 22,200 sf |
| Roof B: | 936 sf    |
| Roof C: | 233 sf    |
| Roof D: | 3,709 sf  |
| Roof E: | 722 sf    |
| Roof F: | 1,223 sf  |
| Roof H: | 5,533 sf  |
| Roof K: | 22,537 sf |
| Roof L: | 746 sf    |
| Total:  | 57,839 sf |

Single-ply  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof G: | 5,747 sf  |
| Roof I: | 5,690 sf  |
| Roof J: | 627 sf    |
| Roof M: | 16,412 sf |
| Roof N: | 1,330 sf  |
| Total:  | 29,806 sf |

Roof Total: 87,645 sf

Hiteon Elementary school  
13800 SW Brockman Rd  
Beaverton, OR



**BEAVERTON SCHOOL DISTRICT**  
**Hiteon Elementary school - Beaverton, OR**

SCALE: NTS

1 of 1

DRAWN BY: D.V.G.

DATE: 3/30/2020

REVISED:

**A-TECH/NORTHWEST, INC.**  
Portland & Prineville, Oregon 503-628-2882

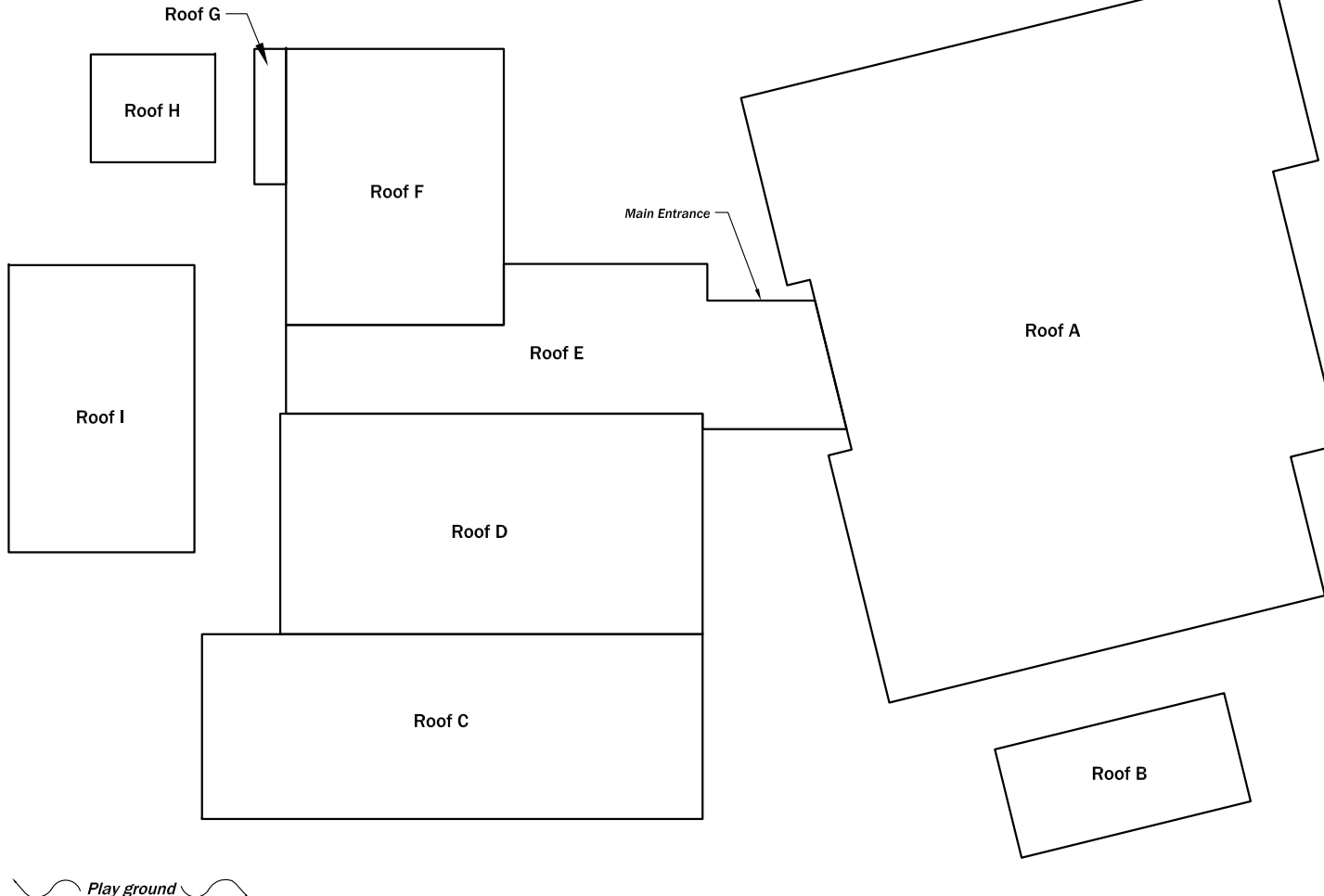


As-Built Drawing

PROJECT NUMBER:  
20054

SW Vermont St →

~~~~~ Parking ~~~~~



**Gravel**  
**ROOF AREA SQ.FT.**  
( Approximate )

|               |                  |
|---------------|------------------|
| Roof A:       | 23,323 sf        |
| Roof B:       | 1,989 sf         |
| Roof C:       | 6,988 sf         |
| Roof D:       | 7,034 sf         |
| Roof E:       | 4,971 sf         |
| Roof F:       | 4,542 sf         |
| Roof G:       | 323 sf           |
| Roof H:       | 1,013 sf         |
| <b>Total:</b> | <b>50,183 sf</b> |

**Single-ply**  
**ROOF AREA SQ.FT.**  
( Approximate )

|         |          |
|---------|----------|
| Roof I: | 4,028 sf |
|---------|----------|

**Roof Total: 54,211 sf**

**Montclair Elementary School**  
**7250 SW Vermont St**  
**Portland, OR**



**BEAVERTON SCHOOL DISTRICT**  
**Montclair Elementary School - Portland, OR**

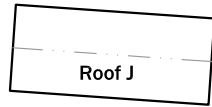
|                 |        |                  |
|-----------------|--------|------------------|
| SCALE: NTS      | 1 of 1 | DRAWN BY: D.V.G. |
| DATE: 3/30/2020 |        | REVISED:         |

**A-TECH/NORTHWEST, INC.**  
Portland & Prineville, Oregon 503-628-2882



As-Built Drawing

PROJECT NUMBER:  
**20054**

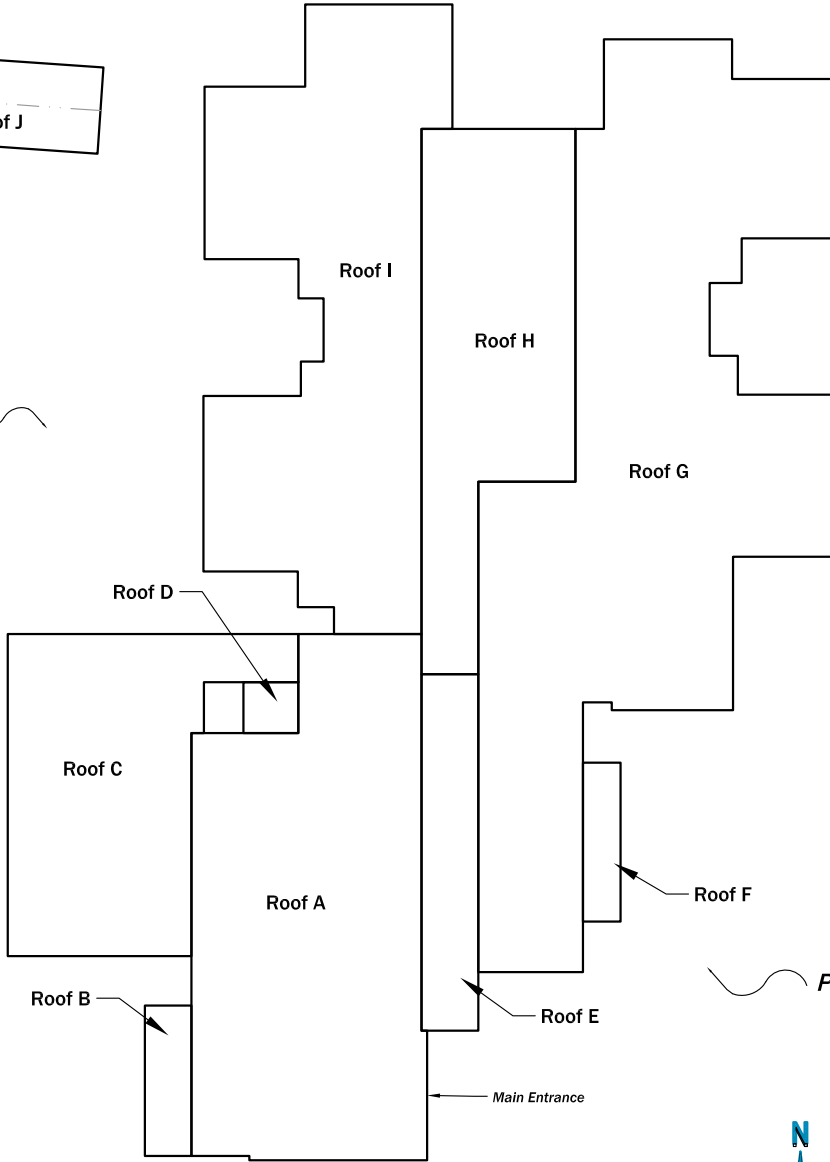


Play ground

Parking

NW Wendy Ln

Parking




| Gravel<br>ROOF AREA SQ.FT.<br>( Approximate ) |           |
|---|-----------|
| Roof A:                                       | 11,574 sf |
| Roof B:                                       | 731 sf    |
| Roof C:                                       | 6,779 sf  |
| Roof D:                                       | 291 sf    |
| Roof E:                                       | 2,111 sf  |
| Roof F:                                       | 622 sf    |
| Roof G:                                       | 19,154 sf |
| Roof H:                                       | 6,804 sf  |
| Roof I:                                       | 11,582 sf |
| Total:  | 59,648 sf |

| Comp Shingle<br>ROOF AREA SQ.FT.<br>( Approximate ) |           |
|---|-----------|
| Roof J:   | 1,794 sf  |
| Roof Total:   | 61,442 sf |

Jacob Wismer Elementary School  
5477 NW Skycrest Pkwy  
Portland, OR

NW Skycrest Pkwy



| BEAVERTON SCHOOL DISTRICT<br>Jacob Wismer Elementary School - Portland, OR |        |   |
|--|--------|---|
| SCALE: NTS   | 1 of 1 | DRAWN BY: D.V.G.  |
| DATE: 3/30/2020  |        | REVISED:  |
| A-TECH/NORTHWEST, INC.<br>Portland & Prineville, Oregon 503-628-2882       |        | <br>PROJECT NUMBER:<br>20054 |
| As-Built Drawing   |        |   |



To CIDA  
15895 SW 72<sup>nd</sup> Ave  
Portland, OR 97224

Submitted  
October 14th, 2020  
RDH Building Science Inc.  
5331 S Macadam Avenue #314  
Portland OR 97239

# Contents

|          |                                       |          |
|----------|---------------------------------------|----------|
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| 2.2      | Historic Information                  | 2        |
| 2.3      | Field Work                            | 2        |
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# 1 Project Background

RDH Building Science Inc. (RDH) was retained by CIDA on behalf of Beaverton School District (BSD) to perform a roof moisture survey on built-up roof systems of four (4) school campuses that are included in the BSD portfolio. BSD is planning re-roofing efforts for the 2021 summer season. The purpose of the work described in this report is a) to provide verification that existing built-up roof systems are acceptable for re-cover applications and that manufacturers' warranties can be provided, and b) that there are no hidden or unforeseen conditions associated with the existing roof system. This report documents our findings at built-up roof areas of Jacob Wismer Elementary School, located at 5477 NW Skycrest Pkwy, Portland, OR 97229. Refer to Figure 1.1 for the extent of roof area surveyed.

This report documents data collection and observations from the roof moisture survey. This report has been undertaken for CIDA on behalf of the BSD and is not to be relied on by others.

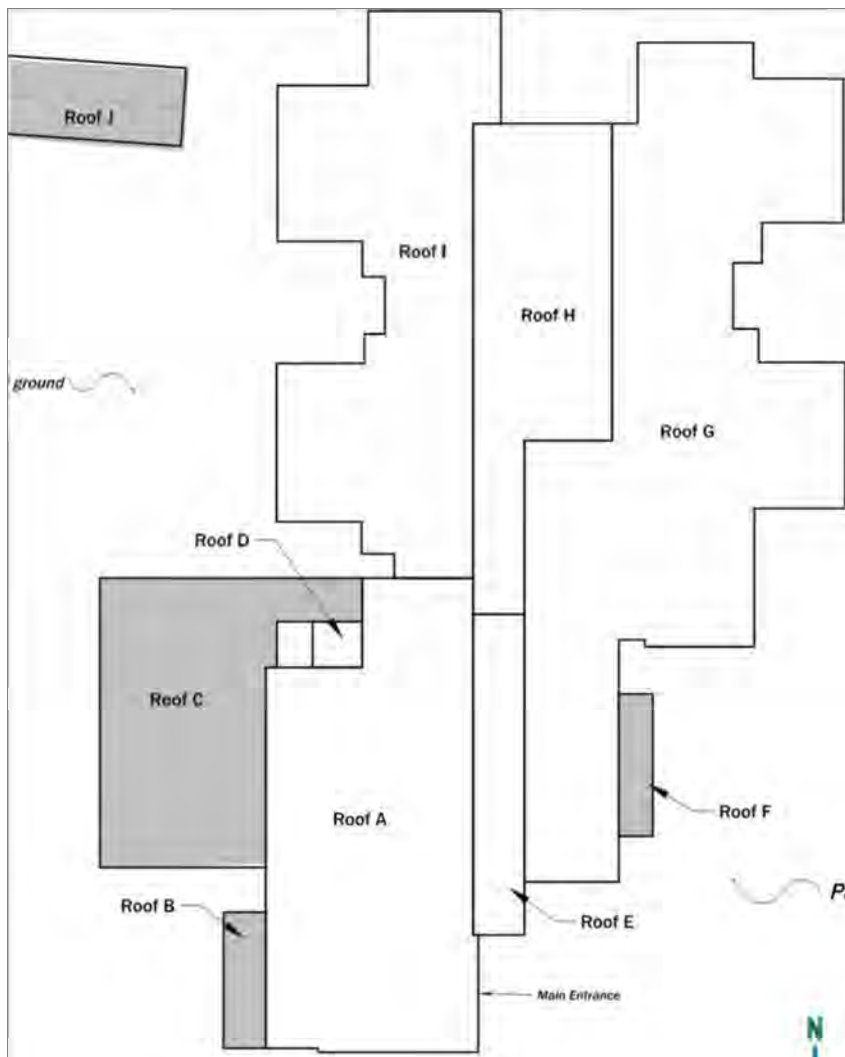


Figure 1.1

Jacob Wismer Elementary School Overall Roof Plan.

Grey shading indicates portion of roof area excluded from the roof moisture survey.

## 2 Data Collection

### 2.1 Document Review

The documents provided to and reviewed by RDH are listed in Table 2.1.

| TABLE 2.1 DOCUMENTS REVIEWED   |   |
|--|---|
| DOCUMENT DESCRIPTION   | DOCUMENT PAGES                            |
| Document Type: Architectural Drawings<br>Title: BSD Jacob Wismer Elementary School: 2021 Re-Roof<br>Author: CIDA<br>Issuance: 08/05/2020 | CS1, AD0.1, AD1.1, A1.1, A2.1, A3.1, S1.1 |
| Document Type: Report<br>Title: Roof Inspection Report<br>Author: A-Tech/Northwest, Inc.<br>Dated 03/06/2020                             | 1-26                                      |

- We note the following relevant information that is related from review of the documents provided:
  - The A-Tech/NW report indicates current interior leakage at two locations: at the southwest section, and the west section.

### 2.2 Historic Information

A history of activities and events including past leakage and repairs relating to the existing roof assembly as reported to us or described in reviewed documents are listed in Table 2.2.

| TABLE 2.2 HISTORIC EVENTS RELATING TO EXISTING ROOF PERFORMANCE |   |
|---|---|
| DATE  | EVENT   |
| 1980  | Approximate date of construction                                |
| 2001  | Tremco built-up roof system installation (Per A-Tech NW report) |
| March 16, 2020  | Current leakage reported at southwest, and the west roof area.  |

### 2.3 Field Work

Relevant information pertaining to the field work performed during the roof moisture survey are included in Table 2.3.

| TABLE 2.3 DETAILS OF FIELD WORK                  |  |
|--|--|
| Dates of Roof Assessment: 2020/09/22, 2020/09/30 |  |
| Impedance Testing                                | Yes  |
| Infrared Scanning                                | No   |
| Test Cuts  | Yes  |
| Method of Roof Access                            | Access Door, Ladder                              |
| RDH Staff in Attendance                          | Cameron Chorney<br>Shinji Coram<br>Scott Mecalis |
| Other Parties in Attendance                      | Juan Cardoso – Carlson Roofing                   |

## 2.4 Existing Roof System

General information and specific components of the existing roof system, as identified by core sampling, are listed in Table 2.4.

| TABLE 2.4 EXISTING ROOF SYSTEM |  |
|--------------------------------|--|
| Roof Age                       | Approximately 19 years                 |
| General Roof Assembly          |  |
| Deck Type                      | Plywood or Concrete (At Rooftop Units) |
| Vapor Barrier                  | None observed                          |
| Insulation                     | 2 1/2" Paper-faced polyisocyanurate    |
| Cover Board                    | ½" Fiberboard                          |
| Roof Membrane                  | Hot-mopped asphalt built-up roofing    |
| Ballast                        | Pea Gravel                             |
| Protection Course              | N/A                                    |
| Means of Drainage              | Internal Drain with Overflow Scupper   |
| Approximate Roof Area          | 59,648 Sq. Ft.                         |
| Warranty Available (Y/N)       | No                                     |

# 3 Observations and Field Testing

## 3.1 Visual Observations

We made the following visual observations during our time on site. Refer to Appendix A for photographic examples of the conditions listed below.

- Embedded flashings are located at penetrations, drains, and perimeters and can result in inconsistent impedance readings.
- There are many penetrations through the roof membrane including rooftop mechanical units, vents, and drains. In general, they appear to be detailed properly to provide a watertight interface. We observe failed sealant in some places.
- In general, the roof membrane is in fair condition. We observe a few localized areas where the asphaltic component is damaged from UV exposure, due to degranulation.



- We did not observe standing water on the roof surface. Some areas have moss/organic growth, especially around roof vents, drains, and other penetrations. Moss/organic growth was cleared to allow impedance scanning in these areas.
- At one location on the east roof area where trees overhang the building, moisture retained in the gravel and tree debris did not allow impedance readings. Refer to Appendix B.
- Moisture is trapped between some roof walk pads, which is expected as walk pads are typically partially adhered, and the roof membrane. Refer to core sample #3.
- The west roof sections (Roof A and I) are drained through internal drain and overflow drains. Through-wall scupper overflows are provided at the east roof section (Roof G) in addition to internal drains.
- The high roofs (Roof E and H) are sloped to gutters on the east and west sides, which drain onto the adjacent roof surface.
- No gravel stops are observed around drain pans. Gravel and dirt cover the drain pans.
- Air filled bubbles and blisters are present in the roof membrane at many locations, which are indicated on the impedance scanning roof plan in Appendix B.
- The large rooftop air handling units have anchors for seismic reinforcing cables, which penetrate the roof membrane. We observe sealant discontinuity at some of these anchors, and impedance scans indicated subsurface moisture at three of these cable anchors.

## 3.2 Impedance Scanning

We performed impedance testing in general accordance with ASTM D7954-15a. Refer to Table 2.3 for general information related to field work. Refer to Table 3.1 for information specifically pertaining to impedance testing.

| TABLE 3.1 IMPEDANCE TESTING DETAILS                               |  |
|---|--|
| Date of Impedance Testing   | 2020/09/22   |
| Time of Impedance Testing   | 1250h to 1330h   |
| Ambient Temperature, Relative Humidity, and Dew Point Temperature |  |
| Pre-Testing   | 70 °F, 61 %RH, 56 °F   |
| Mid-Testing   | 72 °F, 55 %RH, 55 °F   |
| Post-Testing  | 73 °F, 49 %RH, 53 °F   |
| Date and Amount of Last Precipitation Event                       | 0.29 inches on 2020/09/18                                    |
| Impedance Scanner Operator and Data Analyst                       | Cameron Chorney  |
| Scanner Make, Model and Serial Number                             | Tramex DEC DSAL rolling scanner (Serial Number: DS2 0720292) |

Testing was conducted using Technique A, Continuous Systematic Scanning and Recording, by rolling the DSAL scanner on the roof membrane in a systematic and continuous row-by-row manner when traversing the roof surface. This results in scanning 100% of the entire roof survey area.

Impedance testing indicated that four (4) areas of insulation and fiberboard below the roof membrane were measured to have elevated electrical conductivity in comparison to adjacent roof areas. Elevated conductivity is an indication of elevated moisture below the membrane.

Refer to Appendix B for a roof plan that shows color coded locations and relative sizes of areas with elevated EMC readings as determined during impedance testing. All elevated EMC readings are color coded red as all readings were above 100% on the scanner's meter. Appendix B also shows the locations of roof openings and scanner calibration.

## **4 Roof Openings**

ASTM D7954-15a requires that test openings be made into the roof assembly. These openings provide verification results to quantify the actual moisture content found between membrane layers and within insulation.

With the assistance of Carlson Roofing, we conducted four (4) roof core samples at suspected areas of moisture as indicated by impedance scans. Core sample specimens of insulation, fiberboard, and membrane having a minimum of 2-in. diameter were obtained by cutting through these components down to the plywood or concrete deck and removing them from the roofing section under test. Three core sample specimens show signs of moisture present within the roof assembly. The one core sample taken at a walk pad confirmed that moisture is present between walk pads and roofing membrane. We observed the plywood roof deck sheathing to be in good condition at all core samples.

Refer to Appendix C for photographic documentation from roof test openings described above and Appendix B for locations and the moisture findings that are combined with the impedance scan results.

## **5 Summary of Testing**

Impedance testing scanning confirm that some areas of the roof are measured to have elevated subsurface moisture. This testing verifies the need to prioritize roof replacement within the next 1-2 years. Our testing, document review and visual observations confirm the roof is generally in fair condition. We recommend planning for roof replacement in approximately 1-2 years.

We understand that BSD and CIDA are planning on re-roofing at Jacob Wismer in 2021 and the scope of work currently consists of removing the ballast and providing new coverboard and a new single-ply roof system over the existing roof system. The areas with subsurface moisture need to be addressed prior to or as part of this work to avoid trapping moisture within the assembly. If left unaddressed, the trapped moisture may void the manufacturer's warranty of the new roof system.

## 6 Closure

We appreciate the opportunity to work with CIDA and BSD. Please do not hesitate to contact the writer with any questions or to discuss next steps.

Yours truly,



**Cameron Chorney | BASc, CDT**  
Building Science Engineer (EIT)  
cchorney@rdh.com  
503-243-6222 x3152  
**RDH Building Science Inc.**

Reviewed by  
**Scott Mecalis | RA(WA), CSI, CDT**  
Senior Project Architect  
smecalis@rdh.com  
503-867-8519  
**RDH Building Science Inc.**

encl.

Appendix A – Photos of Roof Conditions

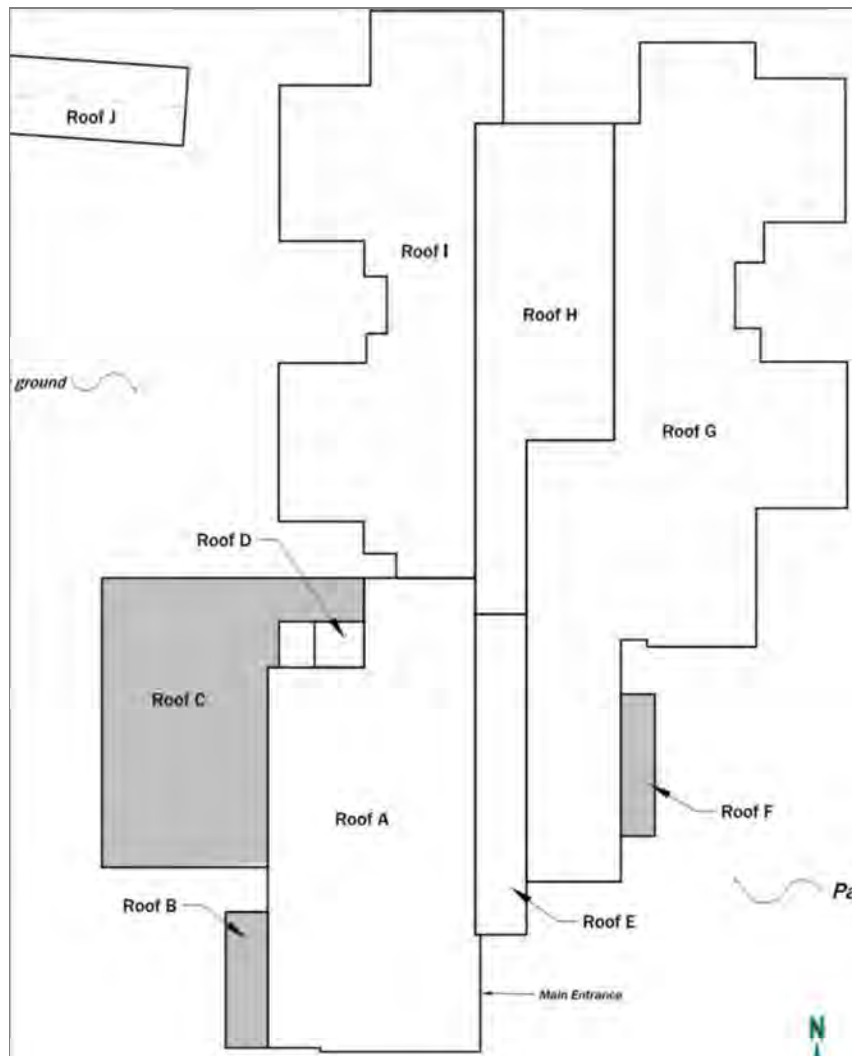
Appendix B - Roof Plan - Impedance Scanning and Cores

Appendix C – Photos – Roof Cores

# Appendix A

## Photos of Roof Conditions

## Appendix A – Photos of Roof Conditions



*Figure A.1*

*Jacob Wismer Elementary  
School Overall Roof Plan.*

*Grey shading indicates portion  
of roof area excluded from the  
roof moisture survey.*



*Figure A.2*

*Jacob Wismer Roof, as viewed from Roof H looking south and east.*



*Figure A.3*

*Jacob Wismer roof, as viewed from Roof H looking east.*



*Figure A.4*

*Jacob Wismer roof, as viewed from Roof A looking north.*



*Figure A.5*

*Asphaltic membrane damaged by UV exposure due to degranulation.*





*Figure A.6*

*Asphaltic membrane damaged by UV exposure due to degranulation.*



*Figure A.7*

*Trees overhang east edge of the roof. Leaves and gravel at east edge retain moisture.*





*Figure A.8*  
*Typical walk pad on roof surface.*



*Figure A.9*  
*Moisture trapped between walk pad and roof membrane.*



*Figure A.10*

*Internal drain and overflow drain at west section at Roof I. No gravel stops observed.*



*Figure A.11*

*Internal drain and overflow scupper at Roof G.*





*Figure A.12*  
*Gutter along high roof at Roof H.*



*Figure A.13*  
*Moss growth near vent penetrations at Roof D.*



*Figure A.14*  
*Air bubble/blister identified*  
*along cricket edge at Roof A.*



*Figure A.15*  
*Air handling unit with seismic*  
*anchor cables.*



*Figure A.16*

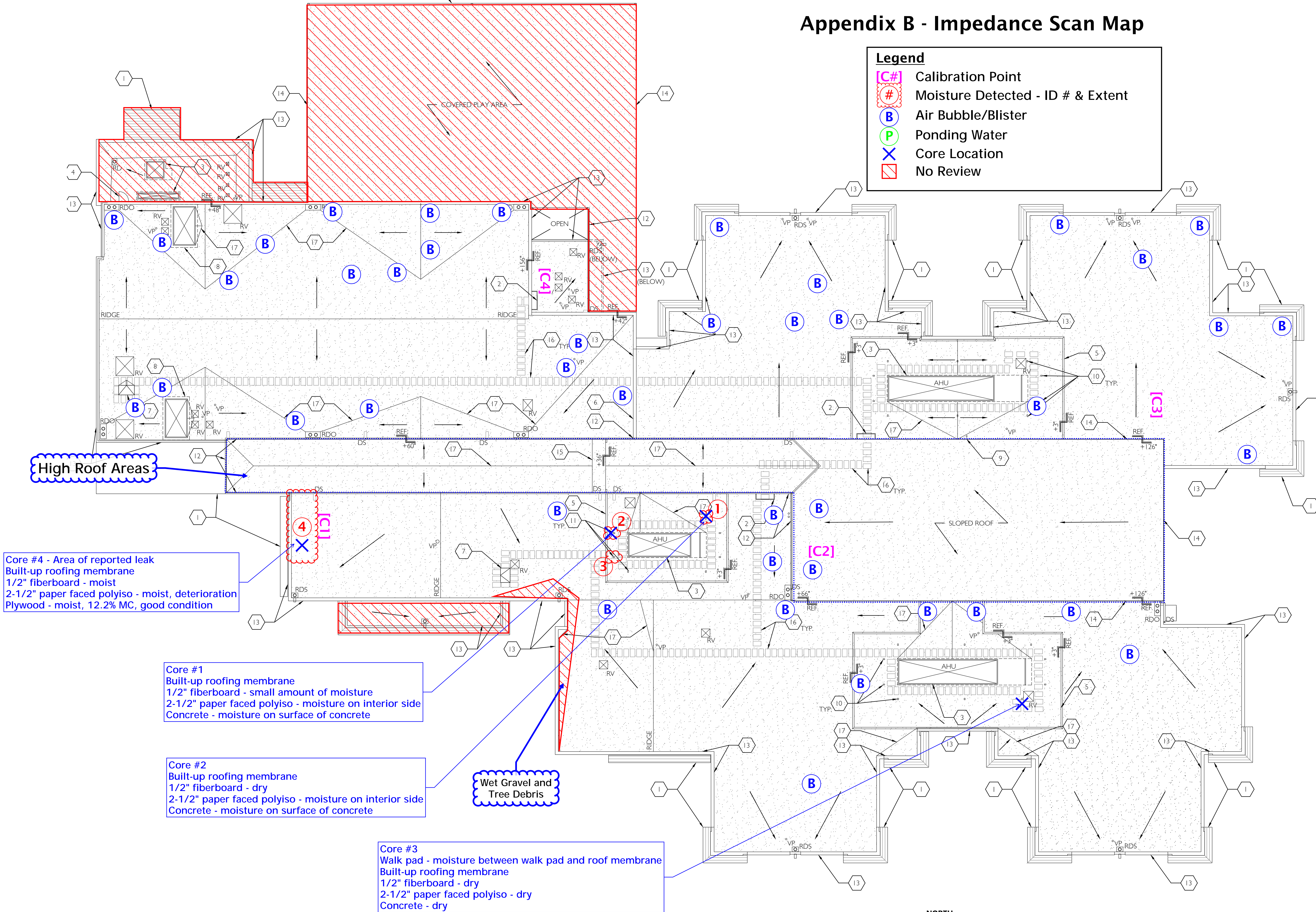
*Impedance readings indicate subsurface moisture at 3 seismic anchors. Discontinuous sealant observed at several.*

# Appendix B

## Roof Plan - Impedance Scanning and



# Appendix B - Impedance Scan Map



# Appendix C

Photos - Roof Cores



## Appendix C – Photos – Roof Cores

### Core #1



*Figure C.1*

*Core #1 within moisture location #2. Electric impedance reading indicates high moisture content within roof assembly.*



*Figure C.2*

*Roof assembly at rooftop unit pad.*

*1" BUR membrane*

*1/2" fiberboard*

*2-1/2" polyiso insulation*

*Concrete deck*



*Figure C.3*

*Small amount of moisture identified in fiberboard layer with water reactive paper tape.*



*Figure C.4*

*Metal anchor plate over concrete decking at rooftop unit pad. Moisture present on concrete surface.*





*Figure C.5*  
*Moisture identified in insulation by using water reactive paper tape.*

## **Core #2**



*Figure C.6*  
*Core #2 within moisture location #1. Electric impedance reading indicates moisture beneath the surface.*



*Figure C.7*  
*Roof assembly at rooftop unit*  
*pad.*  
*1" BUR membrane*  
*1/2" fiberboard*  
*2-1/2" polyiso insulation*  
*Concrete deck*



*Figure C.8*  
*Moisture identified between*  
*insulation and concrete*  
*decking.*



### Core #3



Figure C.9

Core #3 where moisture is suspected to be trapped between walk pad and roofing membrane. Electric impedance scanning indicates subsurface moisture beneath walk pad.



Figure C.10

No moisture detected at portion of membrane not covered by walk pad.



*Figure C.11*  
*1/2" walk pad*  
*1" BUR*  
*1/2" fiberboard*  
*2-1/2" polyiso insulation*  
*Concrete deck*



*Figure C.12*  
*Moisture identified between*  
*walk pad and roofing*  
*membrane, outside of roofing*  
*system.*





*Figure C.13*

*Fiberboard and insulation are dry. No moisture identified within the assembly.*

## **Core #4**



*Figure C.14*

*Core #4 within moisture location #4. Leak reported below opening location.*



*Figure C.15*  
*1/2" BUR*  
*1/2" fiberboard*  
*2-1/2" polyiso insulation*  
*Plywood deck*



*Figure C.16*  
*Fiberboard is wet and*  
*deterioration is present.*





*Figure C.17*

*Insulation is fully deteriorated and wet. Plywood appears to be in good condition.*



*Figure C.18*

*Moisture content (MC) of 12.1% at plywood deck.*

# BSD 2021 Roofing Projects – Montclair Elem. School

## TECHNICAL SPECIFICATIONS



PROJECT NUMBER: 20Y082.05

BID SET: OCTOBER 28, 2020



**AIA DOCUMENT A101-2017** *STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR*

- (INCORPORATED BY REFERENCE)

**AIA DOCUMENT A201-2017** *GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION*

- (INCORPORATED BY REFERENCE)

**BSD TECHNICAL STANDARDS** STANDARDS FOR DESIGN AND CONSTRUCTION OF ALL DISTRICT FACILITIES

- (INCORPORATED BY REFERENCE—PLEASE SEE WEBSITE)

<https://www.beaverton.k12.or.us/departments/facilities-development/technical-standards>

**DIVISION 0 PROCUREMENT AND CONTRACTING REQUIREMENTS**

|        |                   |
|--------|-------------------|
| 000110 | Table of Contents |
| 000115 | List of Drawings  |
| 000120 | Project Team      |

**DIVISION 1 GENERAL CONDITIONS**

|        |  |
|--------|--|
| 011000 | Summary                                  |
| 012200 | Unit Prices                              |
| 012500 | Substitution Procedures                  |
|        | Substitution Request Form: CSI Form 1.5C |
| 013100 | Project Management And Coordination      |
| 013123 | Project Management Database (E-Builder)  |
| 013200 | Construction Progress Documentation      |
| 013300 | Submittal Procedures                     |
| 013553 | Security Procedures                      |
| 014000 | Quality Requirements                     |
| 014200 | References                               |
| 015000 | Temporary Facilities And Controls        |
| 016100 | Common Product Requirements              |
| 017300 | Execution                                |
| 017329 | Cutting And Patching                     |
| 017700 | Closeout Procedures                      |
|        | Closeout Log Template                    |
| 017823 | Operation And Maintenance Data           |
| 017839 | Project Record Documents                 |
| 017900 | Demonstration And Training               |

**DIVISION 2 EXISTING CONDITIONS** (See APPENDIX 'A': ROOF INSPECTION REPORT')

|        |   |
|--------|---|
| 022623 | Limited Supplemental Asbestos Survey Report |
|--------|---|

**DIVISION 3 CONCRETE (NOT USED)**

Project Number: **20Y082.01**

**DIVISION 4 MASONRY (NOT USED)**

**DIVISION 5 METALS (NOT USED)**

**DIVISION 6 WOOD, PLASTICS, AND COMPOSITES**

061000 Rough Carpentry

**DIVISION 7 THERMAL AND MOISTURE PROTECTION**

075323 Ethylene Propylene Diene Monomer (EPDM) Membrane Roofing

**DIVISION 8 OPENINGS (NOT USED)**

**DIVISION 9 FINISHES (NOT USED)**

**APPENDIX A: ROOF INSPECTION REPORT**

- By A-Tech Northwest, Inc. dated 03/26/2020

**APPENDIX B: MOISTURE SURVEY REPORT**

- By RDH Building Science dated 10/14/2020

END OF SECTION

Project Number: **20Y082.01**

## **LIST OF DRAWINGS**

CS1 COVER SHEET  
AD0.1 EXISTING CONDITIONS ROOF PLAN  
AD1.1 DEMO ROOF PLAN  
A1.1 ROOF PLAN  
A2.1 FALL PROTECTION PLAN  
A3.1 DETAILS  
A3.2 DETAILS  
  
S1.1 STRUCTURAL ROOF PLAN  
S2.1 STRUCTURAL DETAILS  
  
M1.1 ROOF PLAN-MECHANICAL  
M2.1 MECHANICAL SPECIFICATIONS  
M2.2 MECHANICAL SPECIFICATIONS

Project Number: **20Y082.01**

## **PROJECT TEAM**

### OWNER

Beaverton School District

16550 SW Merlo Rd

Beaverton, OR 97003

Contact: Megan Finch, Project Manager

E-Mail: [megan\\_finch@beaverton.k12.or.us](mailto:megan_finch@beaverton.k12.or.us)

Phone: (503) 356-4318

Contact: Angela Knotts, Project Coordinator

E-Mail: [angela\\_knotts@beaverton.k12.or.us](mailto:angela_knotts@beaverton.k12.or.us)

Phone: (503) 356-4576

### ARCHITECT/ STRUCTURAL ENGINEER

CIDA

15895 SW 72<sup>ND</sup> Ave, Suite 200

Portland, OR 97224

Contact: Dustin Johnson

E-Mail: [dustinj@cidainc.com](mailto:dustinj@cidainc.com)

Phone: (503) 226-1285

Contact: Curtis Gagner

E-Mail: [curtisg@cidainc.com](mailto:curtisg@cidainc.com)

Phone: (503) 226-1285

### MECHANICAL/ ELECTRICAL ENGINEER & COST CONSULTANT

R&W Engineering, Inc.

9615 SW Allen Blvd, Suite 107

Beaverton, OR 97005

Contact: Ed Carlisle

E-Mail: [ecarlisle@rweng.com](mailto:ecarlisle@rweng.com)

Phone: (503) 726-3322

### ROOFING CONSULTANT

RDH Building Science

5331 S Macadam Ave. #314

Portland, OR 97239

Contact: Kathleen Smith

E-mail: [ksmith@rdh.com](mailto:ksmith@rdh.com)

Phone: (503) 821-7321

Contact: Scott Mecalis

E-Mail: [smecalis@rdh.com](mailto:smecalis@rdh.com)

Phone: (503) 867-8519

### HAZARDOUS MATERIAL SURVEYOR

TRC Solutions

4105 SE International Way

Milwaukie, OR 97222

Contact: Ron Landolt

E-Mail: [rlandolt@trcsolutions.com](mailto:rlandolt@trcsolutions.com)

Phone: (503) 387-3251

Project Number: **20Y082.01**

GENERAL CONTRACTOR

TBD

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

#### B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

### 1.2 PROJECT INFORMATION

#### A. Project Identification: BSD 2021 Roofing Projects: Montclair Elementary School

1. Project Location: 7250 SW Vermont St, Portland, OR 97223

### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

#### A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. New roofing system/ roofing system tear off at main building and covered play area. See architectural plans for areas that are not in scope.

#### B. Type of Contract.

1. Project will be constructed under a single prime contract.
  - a. *Standard Form of Agreement Between Owner and Contractor AIA Document A101, 2017 Edition Modified.*
  - b. *General Conditions of the Contract for Construction AIA Document A201, 2017 Edition Modified.*

### 1.4 ACCESS TO SITE

- #### A. General:
- Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.



- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

## 1.5 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
  - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
  - 3. Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

## 1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
  - 2. Comply with noise ordinances of the authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building and site as follows:
  - 1. Weekdays: 7:00 a.m. to 7:00 p.m (Custodian until 3:30 p.m.).
  - 2. Saturdays and Sundays: Arrange with Owner's Representative
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
  - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products, E-cigarettes/vape devices and other controlled substances on the Project site is not permitted.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Section:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

### 1.2 DEFINITIONS

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

### 1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. Schedule:
  - 1. A "Schedule of Unit Prices" is included at the end of this section.
  - 2. Include as part of each unit price, miscellaneous devices, appurtenances and similar items incidental to or required for a complete system whether or not mentioned as part of the unit price.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 Schedule of Unit Prices:

A. Roof Sheathing Replacement

1. Roof sheathing/ decking replacement at areas discovered during construction to be damaged or rotted. This item includes roof sheathing/ decking found to be rotted or damaged as a result of physical investigation. For the purpose of this unit price item, assume up to 3,800 square feet of sheathing to be replaced.

B. Interior Roof Drain

1. Replacement of entire roof drain assembly, including sump, drain bowl, clamp ring and strainer. Include associated cost of modifying the drain plumbing as needed. For the purpose of this unit price item, assume replacement of up to two full roof drain assemblies.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

### 1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

### 1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Architect to forward any substitution to BSD representative for approval prior to acceptance by the Architect.
  - 1. Substitution Request Form: Use CSI Substitution Request Form 1.5C provided at the end of this section.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Certificates and qualification data, where applicable or requested.
    - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
    - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided

within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 fifteen days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
  - a. Requested substitution has been approved by the Owner.
  - b. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - e. Requested substitution is compatible with other portions of the Work.
  - f. Requested substitution has been coordinated with other portions of the Work.
  - g. Requested substitution provides specified warranty.
  - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Not allowed.

## PART 3 - EXECUTION (Not Used)

END OF SECTION



# 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 ☒ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ \_\_\_\_\_

## SECTION 061000 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Wood blocking, cants, and nailers.
  - 5. Wood furring.
  - 6. Wood sleepers.

#### 1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. OSB: Oriented strand board.
- E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.



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1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
  - 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.

## 2.3 DIMENSION LUMBER FRAMING

A. Ceiling Joists: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WHPA.

B. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WHPA.

C. Exposed Framing Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Species and Grade: As indicated above for load-bearing construction of same type.

## 2.4 ENGINEERED WOOD PRODUCTS

A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2600 psi (17.9 MPa for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).

B. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).

- C. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055.
  - 1. Web Material: Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
  - 2. Structural Properties: Depths and design values not less than those indicated.
  - 3. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.
- D. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.
  - 1. Manufacturer: Provide products by same manufacturer as I-joists.
  - 2. Material: product made from any combination solid lumber, wood strands, and veneers.
  - 3. Thickness: as indicated.
  - 4. Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Cants.
  - 5. Furring.
- B. Dimension Lumber Items: No. 2 grade lumber of any of the following species:
  - 1. Hem-fir; WCLIB or WWPA.
  - 2. Douglas fir-larch; WCLIB or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
  - 1. Douglas fir-larch; No. 2 grade WCLIB or WWPA
  - 2. Hem-fir No. 2 grade: WCLIB, or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

**2.6 FASTENERS**

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

**2.7 METAL FRAMING ANCHORS**

- A. Allowable design loads, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  - 1. Use for wood-preservative-treated lumber and where indicated.
- D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304
  - 1. Use for exterior locations and where indicated.

**2.8 MISCELLANEOUS MATERIALS**

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

**PART 3 - EXECUTION****3.1 INSTALLATION, GENERAL**

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- D. Install metal framing anchors to comply with manufacturer's written instructions.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - 2. ICC-ES evaluation report for fastener.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
  - 1. Comply with indicated fastener patterns where applicable.

2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### 3.3 INSTALLATION OF WOOD FURRING

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring vertically at 24 inches (610 mm) o.c.

### 3.4 INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

- A. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.5 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination drawings.
  - 2. Requests for Information (RFIs).
  - 3. Project Web site.
  - 4. Project meetings.

### 1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, Consultant or Contractor seeking information from each other during construction.

### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.

6. Preinstallation conferences.
7. Project Closeout Conference.
8. Startup and adjustment of systems.
9. Project closeout activities.

#### 1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing and electrical Work.
  2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.
  4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Review: Architect/Consultant will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility.

#### 1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect/Consultant will return RFIs submitted to Architect/Consultant by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.



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- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to the District.
- D. Architect's Action: Architect/Consultant will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect/Consultant after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's/Consultant's action may include a request for additional information, in which case the allotted time for response will date from time of receipt of additional information.
  3. Architect's/Consultant's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect/Consultant and Owner's Representative in writing within seven days of receipt of the RFI response.
- E. On receipt of Architect's/Consultant's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect/Consultant and Owner's Representative within seven days if Contractor disagrees with response.

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- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of Project Web site (e-Builder).

## 1.6 PROPOSAL REQUESTS

- A. Proposal Request Log: Contractor shall maintain a current log of all proposed requests and submit same at each project meeting and with each application for payment. Each proposal request shall have a unique number for tracking purpose. The log shall, at a minimum, show the proposal request number, date initiated, brief description, reference (i.e. RFI or supplemental instruction), estimated cost, estimated time, status, and reason for the proposal request (i.e. Unforeseen Condition/ Regulatory Requirement/ Owner Request/ E&O).

## 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner's Representative and Architect/Consultant of scheduled meeting dates and times.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner's Representative and Architect/Consultant, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
  - 1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Sustainable design requirements.

- l. Preparation of record documents.
    - m. Use of the premises and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.
    - q. Responsibility for temporary facilities and controls.
    - r. Procedures for moisture and mold control.
    - s. Procedures for disruptions and shutdowns.
    - t. Construction waste management and recycling.
    - u. Parking availability.
    - v. Office, work, and storage areas.
    - w. Equipment deliveries and priorities.
    - x. First aid.
    - y. Security.
    - z. Progress cleaning.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
  1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/ Consultant and Owner's Representative of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.

- w. Required performance results.
  - x. Protection of adjacent work.
  - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at intervals indicated in Owner/Contractor Agreement.
1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect/ Consultant, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Progress cleaning.
      - 10) Quality and work standards.
      - 11) Status of correction of deficient items.
      - 12) Field observations.
      - 13) Status of RFIs.
      - 14) Status of proposal requests.
      - 15) Pending changes.
      - 16) Status of Change Orders.

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- 17) Pending claims and disputes.
    - 18) Documentation of information for payment requests.
  3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Project Closeout Conference: Conduct conference prior to Substantial Completion.
  1. Attendees: Owner, Architect/ Consultant, Contractor.
  2. Agenda: Procedures for completing and archiving closeout deliverables in e-Builder;
    - a. Requirements for preparing Record Documents;
    - b. Requirements for preparing O&Ms;
    - c. Submittal of warranties;
    - d. Requirements for delivery of Maintenance stock;
    - e. Requirements for demonstration and training.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 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 and with website’s training documents uploaded to the project folder.
- 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’s Representative: Owner shall pay for and provide licenses/access for the following members of the project team.
  - 1. Lead member of Architect’s/Consultant’s design team responsible.
  - 2. Contractor’s project manager or lead member of Contractor’s project staff.
  - 3. Others as deemed appropriate by Owner’s Representative.

**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 ay 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](http://www.e-builder.net)).
  - d. Users are recommended to have a properly licensed version 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 user’s 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’S 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.

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- 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. All other communication shall be conducted in an industry standard manner.
  - 5. Submittals, contracts, meeting minutes, and other project records.
  - 6. Application for payments.
  - 7. Project closeout.
- 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 communications 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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION



PART 1 - GENERAL

1.1 CONSTRUCTION PROGRESS DOCUMENTATION

- A. Progress Schedules and Reports: The Contractor, within ten calendar days after being awarded the Contract, shall prepare and submit for the information of the Owner's Representative and the Architect/Consultant a Progress Schedule in critical path management ("CPM") format satisfactory to the Owner's 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 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 the 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.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

### 1.2 QUALITY CONTROL

- A. Submit 3-week work schedule, shop drawings, product data, samples, schedule of values and record documents as follows:
  - 1. Submit to Architect/Consultant and Owner's Representative only through General Contractor.
  - 2. The General Contractor shall provide a set of submittals to the Owner's Representative for review and approval concurrent with review by the Architect and Consultant(s).

### 1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's/ Consultant's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
  - 1. Architect/Consultant will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital data files are provided for Contractor's convenience and to help expedite the submittal preparation process. Use of the digital data files is at Contractor's risk and does not release the Contractor from verifying and indicating as-built conditions which may or may not be indicated in the digital data files.
    - c. Contractor shall execute a release of Architect's/Consultant's liability for Contractor's use of the digital data files. Release form shall be provide by Architect/Consultant.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect and Consultant reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect/Consultant's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Consultant or Owner's Representative will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect/Consultant.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Other necessary identification.
- E. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01).

Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/ Consultant.
  4. Include the following information on an inserted cover sheet:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Name of subcontractor.
    - h. Name of supplier.
    - i. Name of manufacturer.
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Related physical samples submitted directly.
    - n. Other necessary identification.
- F. Options: Identify options requiring selection by the Architect.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's/ Consultant's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals that are marked with approval notation from Architect's or Consultant's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

#### A. General Submittal Procedure Requirements:

1. Post electronic submittals as PDF electronic files directly to e-Builder.
  - a. Architect/Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

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2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures." All closeout submittals to be uploaded to e-Builder in format acceptable to the District.
  3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
  4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data without field-verifying as-built conditions which may or may not be indicated at part of the released digital data files.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
  3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/ Consultant will return submittal with options selected.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or

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containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect/Consultant will retain two Sample sets; remainder will be returned.

- 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Submit product schedule in the following format:

- a. PDF electronic file.

- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

- G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

- H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

1. Submit subcontract list in the following format:

- a. PDF electronic file.

- J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

- K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

- M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

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- N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.



PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Consultant and Owner's Representative.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S/ CONSULTANT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect/ Consultant will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect or Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

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.
- 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 Owner's Representative's discretion, the superintendent may be issued a building key to allow access to areas 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 authority.
- K. Contractor shall 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 need to get an ID badge and a hard hat sticker (not provided by BSD), 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 and a hat sticker. The following are the convicted crimes that may appear on the background check:

- Aggravated Murder of 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
- 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 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
- Sadoomasochistic 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 (Including firearms located in a locked 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.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Consultant, Owner's Representative, or authorities having jurisdiction are not limited by provisions of this Section.

### 1.2 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

### 1.3 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### 1.4 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect/Consultant and Owner's Representative with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

## 1.5 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. **Testing Agency Responsibilities:** Cooperate with Architect, Consultant, Owner's Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect/Consultant, Owner's Representative and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- F. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.



1. Schedule times for tests, inspections, obtaining samples, and similar activities.

#### 1.6 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner's Representative will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:
  1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect/Consultant and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect/Consultant and Owner's Representative with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected work.

#### PART 2 - PRODUCTS (Not Used)

#### PART 3 - EXECUTION

##### 3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

## PART 1 - GENERAL

### 1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

### 1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### 1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl1

|        |  |
|--------|--|
| AA     | Aluminum Association, Inc. (The)                                   |
| AAADM  | American Association of Automatic Door Manufacturers               |
| AABC   | Associated Air Balance Council                                     |
| AAMA   | American Architectural Manufacturers Association                   |
| AASHTO | American Association of State Highway and Transportation Officials |
| AATCC  | American Association of Textile Chemists and Colorists             |
| ABAA   | Air Barrier Association of America                                 |
| ABMA   | American Bearing Manufacturers Association                         |
| ACI    | American Concrete Institute  |
| ACPA   | American Concrete Pipe Association                                 |
| AEIC   | Association of Edison Illuminating Companies, Inc. (The)           |
| AF&PA  | American Forest & Paper Association                                |
| AGA    | American Gas Association   |
| AGC    | Associated General Contractors of America (The)                    |
| AHA    | American Hardboard Association<br>(Now part of CPA)                |
| AHAM   | Association of Home Appliance Manufacturers                        |
| AI     | Asphalt Institute  |
| AIA    | American Institute of Architects (The)                             |

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|          |   |
|----------|---|
| AISC     | American Institute of Steel Construction  |
| AISI     | American Iron and Steel Institute   |
| AITC     | American Institute of Timber Construction   |
| ALCA     | Associated Landscape Contractors of America<br>(Now PLANET - Professional Landcare Network)                   |
| ALSC     | American Lumber Standard Committee, Incorporated  |
| AMCA     | Air Movement and Control Association International, Inc.  |
| ANSI     | American National Standards Institute   |
| AOSA     | Association of Official Seed Analysts, Inc.   |
| APA      | Architectural Precast Association   |
| APA      | APA - The Engineered Wood Association   |
| APA EWS  | APA - The Engineered Wood Association; Engineered Wood Systems<br>(See APA - The Engineered Wood Association) |
| API      | American Petroleum Institute  |
| ARI      | Air-Conditioning & Refrigeration Institute  |
| ARMA     | Asphalt Roofing Manufacturers Association   |
| ASCE     | American Society of Civil Engineers   |
| ASCE/SEI | American Society of Civil Engineers/Structural Engineering Institute<br>(See ASCE)                            |
| ASHRAE   | American Society of Heating, Refrigerating and Air-Conditioning Engineers                                     |
| ASME     | ASME International<br>(American Society of Mechanical Engineers International)                                |
| ASSE     | American Society of Sanitary Engineering  |
| ASTM     | ASTM International<br>(American Society for Testing and Materials International)                              |
| AWCI     | Association of the Wall and Ceiling Industry  |
| AWCMA    | American Window Covering Manufacturers Association<br>(Now WCMA)  |
| AWI      | Architectural Woodwork Institute  |

|       |  |
|-------|--|
| AWPA  | American Wood Protection Association<br>(Formerly: American Wood Preservers' Association)              |
| AWS   | American Welding Society   |
| AWWA  | American Water Works Association   |
| BHMA  | Builders Hardware Manufacturers Association  |
| BIA   | Brick Industry Association (The)   |
| BICSI | BICSI, Inc.  |
| BIFMA | BIFMA International<br>(Business and Institutional Furniture Manufacturer's Association International) |
| BISSC | Baking Industry Sanitation Standards Committee   |
| BSD   | Beaverton School District  |
| BWF   | Badminton World Federation<br>(Formerly: IBF - International Badminton Federation)                     |
| CCC   | Carpet Cushion Council   |
| CDA   | Copper Development Association   |
| CEA   | Canadian Electricity Association   |
| CEA   | Consumer Electronics Association   |
| CFFA  | Chemical Fabrics & Film Association, Inc.  |
| CGA   | Compressed Gas Association   |
| CIMA  | Cellulose Insulation Manufacturers Association   |
| CISCA | Ceilings & Interior Systems Construction Association   |
| CISPI | Cast Iron Soil Pipe Institute  |
| CLFMI | Chain Link Fence Manufacturers Institute   |
| CRRC  | Cool Roof Rating Council   |
| CPA   | Composite Panel Association  |
| CPPA  | Corrugated Polyethylene Pipe Association   |
| CRI   | Carpet and Rug Institute (The)   |

|              |  |
|--------------|--|
| CRSI         | Concrete Reinforcing Steel Institute   |
| CSA          | Canadian Standards Association   |
| CSA          | CSA International<br>(Formerly: IAS - International Approval Services)               |
| CSI          | Cast Stone Institute   |
| CSI          | Construction Specifications Institute (The)  |
| CSSB         | Cedar Shake & Shingle Bureau   |
| CTI          | Cooling Technology Institute<br>(Formerly: Cooling Tower Institute)                  |
| DHI          | Door and Hardware Institute  |
| EIA          | Electronic Industries Alliance   |
| EIMA         | EIFS Industry Members Association  |
| EJCDC        | Engineers Joint Contract Documents Committee   |
| EJMA         | Expansion Joint Manufacturers Association, Inc.                                      |
| ESD          | ESD Association<br>(Electrostatic Discharge Association)                             |
| ETL SEMCO    | Intertek ETL SEMCO<br>(Formerly: ITS - Intertek Testing Service NA)                  |
| FIBA         | Federation Internationale de Basketball<br>(The International Basketball Federation) |
| FIVB         | Federation Internationale de Volleyball<br>(The International Volleyball Federation) |
| FM Approvals | FM Approvals LLC   |
| FM Global    | FM Global<br>(Formerly: FMG - FM Global)   |
| FMRC         | Factory Mutual Research<br>(Now FM Global)   |
| FRSA         | Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.        |
| FSA          | Fluid Sealing Association  |

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|       |   |
|-------|---|
| FSC   | Forest Stewardship Council  |
| GA    | Gypsum Association  |
| GANA  | Glass Association of North America                                    |
| GRI   | (Part of GSI)   |
| GS    | Green Seal  |
| GSI   | Geosynthetic Institute  |
| HI    | Hydraulic Institute   |
| HI    | Hydronics Institute   |
| HMMA  | Hollow Metal Manufacturers Association<br>(Part of NAAMM)             |
| HPVA  | Hardwood Plywood & Veneer Association                                 |
| HPW   | H. P. White Laboratory, Inc.  |
| IAS   | International Approval Services<br>(Now CSA International)            |
| IBF   | International Badminton Federation<br>(Now BWF)                       |
| ICEA  | Insulated Cable Engineers Association, Inc.                           |
| ICRI  | International Concrete Repair Institute, Inc.                         |
| IEC   | International Electrotechnical Commission                             |
| IEEE  | Institute of Electrical and Electronics Engineers, Inc. (The)         |
| IESNA | Illuminating Engineering Society of North America                     |
| IEST  | Institute of Environmental Sciences and Technology                    |
| IGCC  | Insulating Glass Certification Council                                |
| IGMA  | Insulating Glass Manufacturers Alliance                               |
| ILI   | Indiana Limestone Institute of America, Inc.                          |
| ISO   | International Organization for Standardization<br>Available from ANSI |
| ISSFA | International Solid Surface Fabricators Association                   |

|       |   |
|-------|---|
| ITS   | Intertek Testing Service NA<br>(Now ETL SEMCO)                                    |
| ITU   | International Telecommunication Union   |
| KCMA  | Kitchen Cabinet Manufacturers Association   |
| LMA   | Laminating Materials Association<br>(Now part of CPA)                             |
| LPI   | Lightning Protection Institute  |
| MBMA  | Metal Building Manufacturers Association  |
| MFMA  | Maple Flooring Manufacturers Association, Inc.                                    |
| MFMA  | Metal Framing Manufacturers Association, Inc.                                     |
| MH    | Material Handling<br>(Now MHIA)   |
| MHIA  | Material Handling Industry of America   |
| MIA   | Marble Institute of America   |
| MPI   | Master Painters Institute   |
| MSS   | Manufacturers Standardization Society of The Valve and Fittings Industry Inc.     |
| NAAMM | National Association of Architectural Metal Manufacturers                         |
| NACE  | NACE International<br>(National Association of Corrosion Engineers International) |
| NADCA | National Air Duct Cleaners Association  |
| NAGWS | National Association for Girls and Women in Sport                                 |
| NAIMA | North American Insulation Manufacturers Association                               |
| NBGQA | National Building Granite Quarries Association, Inc.                              |
| NCAA  | National Collegiate Athletic Association (The)                                    |
| NCMA  | National Concrete Masonry Association   |
| NCPI  | National Clay Pipe Institute  |
| NCTA  | National Cable & Telecommunications Association                                   |



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|       |   |
|-------|---|
| NEBB  | National Environmental Balancing Bureau   |
| NECA  | National Electrical Contractors Association   |
| NeLMA | Northeastern Lumber Manufacturers' Association  |
| NEMA  | National Electrical Manufacturers Association   |
| NETA  | InterNational Electrical Testing Association  |
| NFHS  | National Federation of State High School Associations   |
| NFPA  | NFPA<br>(National Fire Protection Association)  |
| NFRC  | National Fenestration Rating Council  |
| NGA   | National Glass Association  |
| NHLA  | National Hardwood Lumber Association  |
| NLGA  | National Lumber Grades Authority  |
| NOFMA | NOFMA: The Wood Flooring Manufacturers Association<br>(Formerly: National Oak Flooring Manufacturers Association) |
| NOMMA | National Ornamental & Miscellaneous Metals Association  |
| NRCA  | National Roofing Contractors Association  |
| NRMCA | National Ready Mixed Concrete Association   |
| NSF   | NSF International<br>(National Sanitation Foundation International)   |
| NSSGA | National Stone, Sand & Gravel Association   |
| NTMA  | National Terrazzo & Mosaic Association, Inc. (The)  |
| NTRMA | National Tile Roofing Manufacturers Association<br>(Now TRI)  |
| NWWDA | National Wood Window and Door Association<br>(Now WDMA)   |
| OPL   | Omega Point Laboratories, Inc.<br>(Now ITS)   |
| PCI   | Precast/Prestressed Concrete Institute  |
| PDCA  | Painting & Decorating Contractors of America  |

|          |  |
|----------|--|
| PDI      | Plumbing & Drainage Institute  |
| PGI      | PVC Geomembrane Institute  |
| PLANET   | Professional Landcare Network<br>(Formerly: ACLA - Associated Landscape Contractors of America)  |
| PTI      | Post-Tensioning Institute  |
| RCSC     | Research Council on Structural Connections   |
| RFCI     | Resilient Floor Covering Institute   |
| RIS      | Redwood Inspection Service   |
| SAE      | SAE International  |
| SDI      | Steel Deck Institute   |
| SDI      | Steel Door Institute   |
| SEFA     | Scientific Equipment and Furniture Association   |
| SEI/ASCE | Structural Engineering Institute/American Society of Civil Engineers<br>(See ASCE)   |
| SGCC     | Safety Glazing Certification Council   |
| SIA      | Security Industry Association  |
| SIGMA    | Sealed Insulating Glass Manufacturers Association<br>(Now IGMA)  |
| SJI      | Steel Joist Institute  |
| SMA      | Screen Manufacturers Association   |
| SMACNA   | Sheet Metal and Air Conditioning Contractors'<br>National Association  |
| SMPTE    | Society of Motion Picture and Television Engineers   |
| SPFA     | Spray Polyurethane Foam Alliance<br>(Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray<br>Polyurethane Foam Division) |
| SPIB     | Southern Pine Inspection Bureau (The)  |
| SPRI     | Single Ply Roofing Industry  |

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|         |  |
|---------|--|
| SSINA   | Specialty Steel Industry of North America  |
| SSPC    | SSPC: The Society for Protective Coatings  |
| STI     | Steel Tank Institute   |
| SWI     | Steel Window Institute   |
| SWRI    | Sealant, Waterproofing, & Restoration Institute  |
| TCA     | Tile Council of America, Inc.<br>(Now TCNA)  |
| TCNA    | Tile Council of North America, Inc.  |
| TIA/EIA | Telecommunications Industry Association/Electronic Industries Alliance                                   |
| TMS     | The Masonry Society  |
| TPI     | Truss Plate Institute, Inc.  |
| TPI     | Turfgrass Producers International  |
| TRI     | Tile Roofing Institute   |
| UL      | Underwriters Laboratories Inc.   |
| UNI     | Uni-Bell PVC Pipe Association  |
| USAV    | USA Volleyball   |
| USGBC   | U.S. Green Building Council  |
| USITT   | United States Institute for Theatre Technology, Inc.   |
| WASTEC  | Waste Equipment Technology Association   |
| WCLIB   | West Coast Lumber Inspection Bureau  |
| WCMA    | Window Covering Manufacturers Association  |
| WCSC    | Window Covering Safety Council<br>(Formerly: WCMA - Window Covering Manufacturers Association)           |
| WDMA    | Window & Door Manufacturers Association<br>(Formerly: NWWDA - National Wood Window and Door Association) |
| WI      | Woodwork Institute (Formerly: WIC - Woodwork Institute of California)                                    |
| WIC     | Woodwork Institute of California<br>(Now WI)   |

WMMPA        Wood Moulding & Millwork Producers Association

WSRCA        Western States Roofing Contractors Association

WWPA        Western Wood Products Association

C.    Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

PRIVATE tbl2

IAPMO       International Association of Plumbing and Mechanical Officials

ICC        International Code Council

ICC-ES      ICC Evaluation Service, Inc.

UBC        Uniform Building Code  
(See ICC)

D.    Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl3

CE        Army Corps of Engineers

CPSC       Consumer Product Safety Commission

DOC        Department of Commerce

DOD        Department of Defense

DOE        Department of Energy

EPA        Environmental Protection Agency

FAA        Federal Aviation Administration

FCC        Federal Communications Commission

FDA        Food and Drug Administration

GSA        General Services Administration

HUD        Department of Housing and Urban Development

LBL        Lawrence Berkeley National Laboratory

NCHRP      National Cooperative Highway Research Program  
(See TRB)

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|      |  |
|------|--|
| NIST | National Institute of Standards and Technology |
| OSHA | Occupational Safety & Health Administration    |
| PBS  | Public Buildings Service<br>(See GSA)          |
| PHS  | Office of Public Health and Science            |
| RUS  | Rural Utilities Service<br>(See USDA)          |
| SD   | State Department                               |
| TRB  | Transportation Research Board                  |
| USDA | Department of Agriculture                      |
| USPS | Postal Service                                 |

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl4

|         |  |
|---------|--|
| ADAAG   | Americans with Disabilities Act (ADA)<br>Architectural Barriers Act (ABA)<br>Accessibility Guidelines for Buildings and Facilities<br>Available from U.S. Access Board   |
| CFR     | Code of Federal Regulations<br>Available from Government Printing Office   |
| DOD     | Department of Defense Military Specifications and Standards<br>Available from Department of Defense Single Stock Point   |
| DSCC    | Defense Supply Center Columbus<br>(See FS)   |
| FED-STD | Federal Standard<br>(See FS)   |
| FS      | Federal Specification<br>Available from Department of Defense Single Stock Point<br><br>Available from Defense Standardization Program<br><br>Available from General Services Administration<br><br>Available from National Institute of Building Sciences |

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FTMS      Federal Test Method Standard  
(See FS)

MIL      (See MILSPEC)

MIL-STD   (See MILSPEC)

MILSPEC   Military Specification and Standards  
Available from Department of Defense Single Stock Point

UFAS      Uniform Federal Accessibility Standards  
Available from Access Board

F.      State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

PRIVATE tbl5

CBHF   State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR      California Code of Regulations

CPUC   California Public Utilities Commission

TFS      Texas Forest Service  
Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

### 1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect/Consultant, Owner's Representative, testing agencies, and authorities having jurisdiction. Temporary facilities required for the project include but may not be limited to:
  - 1. Sanitary Facilities
  - 2. Telephone/Fax
  - 3. Internet
- B. Water from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

### 1.4 QUALITY ASSURANCE

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

### 1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## PART 2 - PRODUCTS

### 2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

### 2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures."

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  - 1. Provide portable facilities as required for workmen. Keep facilities clean and in sanitary condition. Remove from the site upon completion of the Work.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.



- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
  - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  - 2. At a conspicuous place within the primary field office post a list of important telephone numbers, including:
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Architect's office.
    - e. Engineers' offices.
    - f. Owner's Representative's office.
    - g. Principal subcontractors' field and home offices.

### 3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- B. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- C. Temporary Enclosures: Contractor to provide Weather Mitigation Plan in the event of rain and to establish procedures for temporary protection as well as an emergency contact list, please see roofing specification 075323 for additional information. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Prohibit smoking in construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  - 3. Develop and supervise an overall fire-prevention -and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### 3.4 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  - 1. 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 to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION

## 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/Consultant and Owner's Representative.
- 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 by the Architect/Consultant or Owner's Representative.
- 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 submittal to the Architect through the Owner's Project Management Database (e-Builder).\
- 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.

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1. Consult with Architect/Consultant 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Coordination of Owner-installed products.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
  - 8. Correction of the Work.
- B. Related Sections:
  - 1. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 2. Division 01 Section "Cutting and Patching".

### 1.2 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect and Owner's Representative for the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner's Representative that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect/ Consultant according to requirements in Division 01 Section "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and as-built conditions. If discrepancies are discovered, notify Architect/ Consultant promptly.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Allow for building movement, including thermal expansion and contraction.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.6 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.



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- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

### 3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

### 3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

### 1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio. Notify A/E immediately and without further modification to structural elements if such compromise to structure inadvertently occurs.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Notify A/E immediately if such compromise to operational elements inadvertently occurs.

### 1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials. Submit 3 samples for Architect and Owner approval.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

### 3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

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1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.

### 1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner's Representative of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 8. Complete startup testing of systems.
  - 9. Submit test/adjust/balance records.
  - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 11. Advise Owner of changeover in heat and other utilities.
  - 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  - 13. Complete final cleaning requirements, including touchup painting.
  - 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
  - 15. Prepare Closeout Log: An electronic spreadsheet log listing all closeout deliverables required in the specifications including contractor's record drawings, warranties, shop drawings, product data, extra stock, training and O&Ms. See Sample Closeout Log provided in at the end of this section.

- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  - 2. Results of completed inspection will form the basis of requirements for final completion.

### 1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
  - 1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
  - 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 4. Submit pest-control final inspection report and warranty.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect, Consultant and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### 1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize list of spaces in a sequential order.
  - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  - 3. Submit list of incomplete items in the following format:
    - a. PDF electronic file.

## 1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Scan warranties and bonds and assemble complete warranty and bond submittal package into individual PDF files organized by specification section.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
- m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
- o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- r. Leave Project clean and ready for occupancy.

END OF SECTION



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operations and Maintenance Manual.
- B. See Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

### 1.2 SUBMITTALS

- A. Manual: Submit electronic manual in final form at least 15 days before final inspection. Architect/Consultant and Owner's Representative will return an electronic copy with comments within 15 days after final inspection.
  - 1. Correct or modify each manual to comply with Architect's comments. Submit final electronic copy of each corrected manual within 15 days of receipt of Architect's/Consultant's and Owner's Representative's comments.

## PART 2 - PRODUCTS

### 2.1 MANUAL, GENERAL

- A. Organization: Unless otherwise indicated, organize manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. The manual shall contain a title page, table of contents, and manual contents.
- B. Title Page: Include the following information:
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Name and address of Owner.
  - 4. Date of submittal.
  - 5. Name, address, and telephone number of Contractor.
  - 6. Name and address of Architect.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Arrange contents numerically by specification section.

**OPERATION INFORMATION**

- E. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.
- F. Descriptions: Include the following:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Equipment identification with serial number of each component.
  - 4. Equipment function.
  - 5. Operating characteristics.
  - 6. Limiting conditions.
  - 7. Performance curves.
  - 8. Engineering data and tests.
  - 9. Complete nomenclature and number of replacement parts.
- G. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
- H. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- I. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

**PRODUCT MAINTENANCE INFORMATION**

- J. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- K. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- L. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- M. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

- N. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- O. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

#### SYSTEMS AND EQUIPMENT MAINTENANCE INFORMATION

- P. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- Q. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- R. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:
- S. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions that detail essential maintenance procedures:
- T. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- U. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- V. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- W. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

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- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- D. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.
- E. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. See Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
- C. See Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

### 1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Submit one set of marked-up Record Prints, and the following:
      - 1) Record CAD Drawing Files and Plots: One set.
      - 2) Copies printed from Record CAD Drawing Plots: One. Plot and print each Drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one copy copies of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
  - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

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- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  2. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
  2. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Architect for resolution.
  4. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into single PDF file.
  2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
  4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

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1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

# PART 3 - EXECUTION

## 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION

PART 1 - GENERAL

1.1 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to Final Completion or acceptance, fully instruct the Owner's Designated Representative and maintenance personnel in the operation, adjustment, and maintenance of all products, equipment, and systems.
  - 1. The District reserves the right to videotape training sessions.
- B. Operating and maintenance manual shall constitute the basis of instruction.
  - 1. Review contents of manual with Owner's personnel in full detail to explain all aspects of operations and maintenance.
  - 2. Review complete heating and cooling cycles with Owner's Designated Representative. Review location of dampers, valves, and control equipment.

END OF SECTION



Project Number: **20Y082.01**

022623      LIMITED SUPPLEMENTAL ASBESTOS SURVEY REPORT  
(see next page)

# **LIMITED SUPPLEMENTAL ASBESTOS SURVEY REPORT**

## **Montclair Elementary School Roof Project**

**7250 SW Vermont Street  
Portland, OR 97223**

Prepared for:

### **Beaverton School District**

**16550 SW Merlo Road  
Beaverton, OR 97006**

**Inspection Dates:** August 11, 2020  
**Report Prepared:** September 2, 2020

Prepared By:



**4105 SE International Way, Suite 505  
Milwaukie, OR 97222  
503.387.3251**

TRC Project Number: 406451

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### Appendices

- Appendix A – Figures
- Appendix B – Laboratory Analytical Data Sheets
- Appendix C – Inspector Certification(s)

## **EXECUTIVE SUMMARY**

TRC Environmental Corporation (TRC) was contracted by the Beaverton School District to conduct a supplemental asbestos survey, including collection of bulk asbestos samples, laboratory analysis, and preparation of a report for Montclair Elementary School located at 7250 SW Vermont Street in Portland, Oregon 97223. Mr. Matt Cuda, AHERA accredited building inspector performed the survey on August 11<sup>th</sup>, 2020. 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, based on the PLM method.

However, 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 supplemental asbestos survey was conducted by TRC at Montclair Elementary School, located at 7250 SW Vermont Street in Portland, Oregon. It was reported by the client that this limited asbestos survey is being conducted in conjunction with their planned roof renovation project. The survey activities were performed on August 11<sup>th</sup>, 2020, 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. Laboratory analytical results are presented in Appendix B.

Mr. Matt Cuda, 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

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 EMC Labs, Inc., in Phoenix, Arizona, 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, July 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 |
|---|--------------------------------------|-----------------|------------------|----------------------|
| M-01A<br>M-01B<br>M-01C<br>M-01D<br>M-01E<br>M-01F<br>M-01G | Built-up Roofing with Gravel Overlay | Throughout Roof | ND               | N/A                  |
| M-02A<br>M-02B<br>M-02C                                     | Composite Roofing                    | Throughout Roof | ND               | N/A                  |
| M-03A<br>M-03B<br>M-03C                                     | Silver Roof Paint                    | Throughout Roof | ND               | N/A                  |
| M-04A<br>M-04B<br>M-04C                                     | White/Gray Roof Caulking             | Throughout Roof | ND               | N/A                  |
| M-05A<br>M-05B<br>M-05C                                     | Black Roof Caulking                  | Throughout Roof | ND               | N/A                  |

ND = Non-detect

SF = Square feet

LF = Linear Feet

N/A = Not Applicable

### Asbestos Containing Materials (ACMs)

Results of the bulk sampling indicated none of the materials sampled during this limited survey contained detectable levels of asbestos, based on the PLM method.

### Non-Detect Materials (ND)

Asbestos was not detected in the following materials sampled during this investigation:

| Material                             | Location        |
|--------------------------------------|-----------------|
| Built-up Roofing with Gravel Overlay | Throughout Roof |
| Composite Roofing                    | Throughout Roof |
| Silver Roof Paint                    | Throughout Roof |
| White/Gray Roof Caulking             | Throughout Roof |
| Black Roof Caulking                  | Throughout Roof |

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., hidden roofing materials, 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

Results of the bulk sampling indicated none of the materials sampled during this survey contained detectable levels of asbestos, based on the PLM method. However, 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

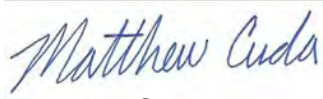
The content presented in this report is based on data collected during the site inspection and survey, review of pertinent regulations, requirements, guidelines and commonly followed industry standards, and information provided by the Beaverton School District, their clients, agents, and representatives.

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**



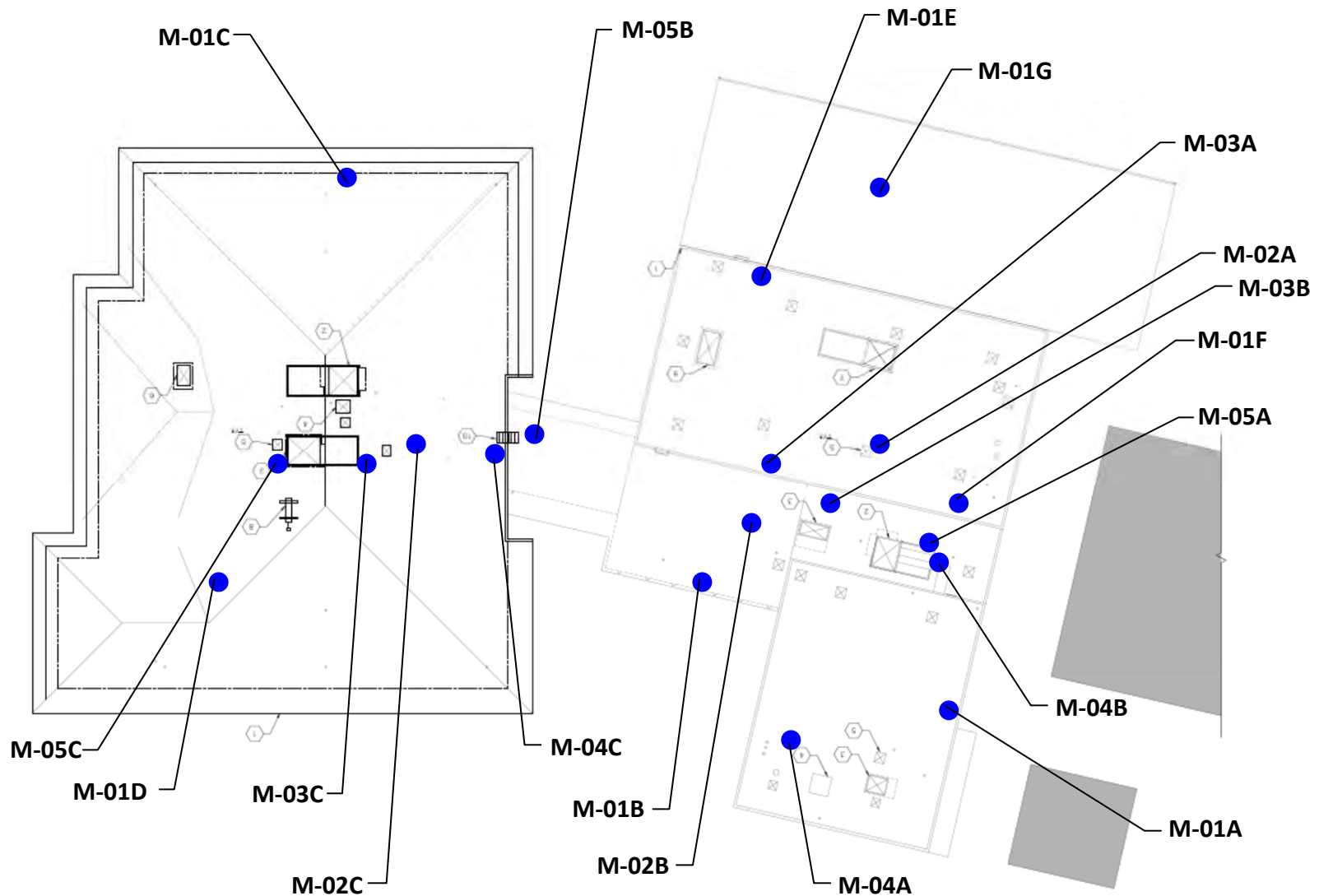
Matthew Cuda  
Project Manager



Ron Landolt, CAC  
NW Region BSI Practice Manager



## **Appendix A – Figure(s)**



#### LEGEND

- — Non-Asbestos Sample Location
- ★ — Asbestos-Containing Sample Location
- ▲ — OSHA Regulated Sample Location

#### ASBESTOS SURVEY REPORT SAMPLE LOCATION DIAGRAM

MONTCLAIR ELEMENTARY SCHOOL  
7250 SW VERMONT STREET  
PORTLAND, OREGON 97007

TRC Project No.: 406451.0001

Figure: 1

Drawn by: MC

Reviewed by: RAL

Date: September 2020



4105 SE International Way, Suite 505  
Milwaukie, Oregon 97222  
Phone: (503) 387-3251 Fax: (503) 908-1318

## **Appendix B – Laboratory Analytical Data Sheets**

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0241380**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 406451           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 08/12/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 08/17/2020       |
| Collected:    | 08/11/2020                         | Date Reported: | 08/17/2020       |
| Project Name: | BSD-MONTCLAIR E.S. ROOF PROJECT    | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID  | Sample<br>Location                                  | Layer Name /<br>Sample Description     | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents   |
|----------------------|---|--|----------------------|----------------------|--|
| 0241380-001<br>M-01A | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>CAFETERIA AREA | LAYER 1<br>Gravel Overlay, Gray/ Black | No                   | None Detected        | Cellulose Fiber 3%   |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 97%                                |
|                      |   | LAYER 2<br>Built-up Roofing, Black     | No                   | None Detected        | Fibrous Glass 20%<br>Synthetic Fiber 10%<br>Cellulose Fiber 5%           |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 65%                                |
|                      |   | LAYER 3<br>Built-up Roofing, Black     | No                   | None Detected        | Cellulose Fiber 40%<br>Carbonates<br>Quartz<br>Binder/Filler 60%         |
|                      |   |  |                      |                      |  |
|                      |   | LAYER 4<br>Insulation, Yellow/ Brown   | No                   | None Detected        | Cellulose Fiber 75%<br>Foam<br>Carbonates<br>Gypsum<br>Binder/Filler 25% |
|                      |   |  |                      |                      |  |
|                      |   |  |                      |                      |  |
|                      |   |  |                      |                      |  |
|                      |   |  |                      |                      |  |
|                      |   |  |                      |                      |  |

# EMC LABS, INC.

9830 S. 51st Street, Suite B109, Phoenix, AZ 85044  
Phone: 800-362-3373 or 480-940-5294 - Fax: (480) 893-1726

Laboratory Report

**0241380**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 406451           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 08/12/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 08/17/2020       |
| Collected:    | 08/11/2020                         | Date Reported: | 08/17/2020       |
| Project Name: | BSD-MONTCLAIR E.S. ROOF PROJECT    | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID  | Sample<br>Location                                   | Layer Name /<br>Sample Description     | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents |
|----------------------|--|--|----------------------|----------------------|------------------------------|
| 0241380-002<br>M-01B | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM MAIN<br>ENTRY AREA | LAYER 1<br>Gravel Overlay, Gray/ Black | No                   | None Detected        | Cellulose Fiber <1%          |
|                      |  |  |                      |                      | Quartz                       |
|                      |  |  |                      |                      | Gypsum                       |
|                      |  |  |                      |                      | Carbonates                   |
|                      |  |  |                      |                      | Binder/Filler 99%            |
|                      |  | LAYER 2<br>Built-up Roofing, Black     | No                   | None Detected        | Fibrous Glass 20%            |
|                      |  |  |                      |                      | Synthetic Fiber 10%          |
|                      |  |  |                      |                      | Cellulose Fiber 5%           |
|                      |  |  |                      |                      | Carbonates                   |
|                      |  |  |                      |                      | Quartz                       |
|                      |  |  |                      |                      | Binder/Filler 65%            |
|                      |  | LAYER 3<br>Built-up Roofing, Black     | No                   | None Detected        | Cellulose Fiber 35%          |
|                      |  |  |                      |                      | Fibrous Glass 5%             |
|                      |  |  |                      |                      | Synthetic Fiber 5%           |
|                      |  |  |                      |                      | Carbonates                   |
|                      |  |  |                      |                      | Quartz                       |
|                      |  |  |                      |                      | Binder/Filler 55%            |
|                      |  | LAYER 4<br>Insulation, Brown           | No                   | None Detected        | Cellulose Fiber 98%          |
|                      |  |  |                      |                      | Gypsum                       |
|                      |  |  |                      |                      | Binder/Filler 2%             |
|                      |  |  |                      |                      |                              |
|                      |  |  |                      |                      |                              |
|                      |  |  |                      |                      |                              |
|                      |  |  |                      |                      |                              |

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Laboratory Report

**0241380**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 406451           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 08/12/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 08/17/2020       |
| Collected:    | 08/11/2020                         | Date Reported: | 08/17/2020       |
| Project Name: | BSD-MONTCLAIR E.S. ROOF PROJECT    | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID  | Sample<br>Location                                | Layer Name /<br>Sample Description     | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                   |
|----------------------|---|--|----------------------|----------------------|--|
| 0241380-003<br>M-01C | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>CLASSRM AREA | LAYER 1<br>Gravel Overlay, Gray/ Black | No                   | None Detected        | Cellulose Fiber <1%  |
|                      |   |  |                      |                      | Quartz<br>Gypsum<br>Carbonates<br>Binder/Filler 99%            |
|                      |   | LAYER 2<br>Built-up Roofing, Black     | No                   | None Detected        | Fibrous Glass 20%<br>Synthetic Fiber 10%<br>Cellulose Fiber 5% |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 65%                      |
|                      |   | LAYER 3<br>Built-up Roofing, Black     | No                   | None Detected        | Cellulose Fiber 45%  |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 55%                      |
|                      |   | LAYER 4<br>Insulation, Brown           | No                   | None Detected        | Cellulose Fiber 98%  |
|                      |   |  |                      |                      | Carbonates<br>Gypsum<br>Binder/Filler 2%                       |

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**0241380**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 406451           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 08/12/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 08/17/2020       |
| Collected:    | 08/11/2020                         | Date Reported: | 08/17/2020       |
| Project Name: | BSD-MONTCLAIR E.S. ROOF PROJECT    | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID  | Sample<br>Location                                | Layer Name /<br>Sample Description     | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                   |
|----------------------|---|--|----------------------|----------------------|--|
| 0241380-004<br>M-01D | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>CLASSRM AREA | LAYER 1<br>Gravel Overlay, Gray/ Black | No                   | None Detected        | Cellulose Fiber 10%<br>Fibrous Glass 10%                       |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80%                      |
|                      |   | LAYER 2<br>Built-up Roofing, Black     | No                   | None Detected        | Fibrous Glass 20%<br>Synthetic Fiber 10%<br>Cellulose Fiber 5% |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 65%                      |
|                      |   | LAYER 3<br>Built-up Roofing, Black     | No                   | None Detected        | Fibrous Glass 20%<br>Synthetic Fiber 20%                       |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 60%                      |
|                      |   | LAYER 4<br>Tar, Black                  | No                   | None Detected        | Cellulose Fiber 2%<br>Synthetic Fiber 1%<br>Fibrous Glass <1%  |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 96%                      |
|                      |   |  |                      |                      |  |
|                      |   |  |                      |                      |  |
|                      |   |  |                      |                      |  |
|                      |   |  |                      |                      |  |

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Laboratory Report

**0241380**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 406451           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 08/12/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 08/17/2020       |
| Collected:    | 08/11/2020                         | Date Reported: | 08/17/2020       |
| Project Name: | BSD-MONTCLAIR E.S. ROOF PROJECT    | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID  | Sample<br>Location                            | Layer Name /<br>Sample Description   | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents              |
|----------------------|---|--|----------------------|----------------------|---|
| 0241380-005<br>M-01E | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM GYM<br>ROOF | LAYER 1<br>Gravel Overlay/ Built-up Roofing,<br>Gray/ Black<br>Note: Unable to separate<br>adjacent layers | No                   | None Detected        | Cellulose Fiber 10%                       |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 90% |
|                      |   | LAYER 2<br>Built-up Roofing, Black   | No                   | None Detected        | Cellulose Fiber 30%                       |
|                      |   |  |                      |                      | Fibrous Glass 5%                          |
|                      |   |  |                      |                      | Synthetic Fiber 5%                        |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 60% |
|                      |   | LAYER 3<br>Insulation, Brown   | No                   | None Detected        | Cellulose Fiber 98%                       |
|                      |   |  |                      |                      | Gypsum<br>Binder/Filler 2%                |
|                      |   | LAYER 4<br>Built-up Roofing, Black   | No                   | None Detected        | Cellulose Fiber 30%                       |
|                      |   |  |                      |                      | Fibrous Glass 5%                          |
|                      |   |  |                      |                      | Synthetic Fiber 5%                        |
|                      |   |  |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 60% |



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0241380

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client: TRC SOLUTIONS Job# / P.O. #: 406451  
Address: 4105 SE INTERNATIONAL WAY, STE 505 Date Received: 08/12/2020  
MILWAUKIE OR 97222 Date Analyzed: 08/17/2020  
Collected: 08/11/2020 Date Reported: 08/17/2020  
Project Name: BSD-MONTCLAIR E.S. ROOF PROJECT EPA Method: EPA 600/R-93/116  
Address: Submitted By: MATT CUDA  
Collected By:

| Lab ID<br>Client ID  | Sample<br>Location  | Layer Name /<br>Sample Description   | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents  |
|----------------------|---|--|----------------------|----------------------|---|
| 0241380-006<br>M-01F | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM GYM<br>ROOF             | LAYER 1<br>Gravel Overlay, Gray/ Black<br>Note: Unable to separate<br>adjacent layers                      | No                   | None Detected        | Cellulose Fiber <1%<br><br>Quartz<br>Carbonates<br>Gypsum<br>Binder/Filler 99%                                |
|                      |   | LAYER 2<br>Built-up Roofing, Black   | No                   | None Detected        | Cellulose Fiber 30%<br>Synthetic Fiber 10%<br>Carbonates<br>Quartz<br>Binder/Filler 60%                       |
|                      |   | LAYER 3<br>Built-up Roofing, Black   | No                   | None Detected        | Cellulose Fiber 35%<br>Fibrous Glass 5%<br>Carbonates<br>Quartz<br>Binder/Filler 60%                          |
|                      |   | LAYER 4<br>Insulation, Brown   | No                   | None Detected        | Cellulose Fiber 98%<br>Gypsum<br>Binder/Filler 2%   |
| 0241380-007<br>M-01G | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>COVERED PLAY<br>AREA | LAYER 1<br>Gravel Overlay/ Built-up Roofing,<br>Gray/ Black<br>Note: Unable to separate<br>adjacent layers | No                   | None Detected        | Fibrous Glass 5%<br>Synthetic Fiber 3%<br>Cellulose Fiber 2%<br><br>Carbonates<br>Quartz<br>Binder/Filler 90% |
|                      |   | LAYER 2<br>Built-up Roofing, Black   | No                   | None Detected        | Cellulose Fiber 30%<br>Fibrous Glass 5%<br>Synthetic Fiber 5%<br>Carbonates<br>Quartz<br>Binder/Filler 60%    |
|                      |   | LAYER 3<br>Insulation, Brown   | No                   | None Detected        | Cellulose Fiber 98%<br>Gypsum<br>Binder/Filler 2%   |
|                      |   |  |                      |                      |   |

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Laboratory Report

**0241380**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

|               |                                    |                |                  |
|---------------|------------------------------------|----------------|------------------|
| Client:       | TRC SOLUTIONS                      | Job# / P.O. #: | 406451           |
| Address:      | 4105 SE INTERNATIONAL WAY, STE 505 | Date Received: | 08/12/2020       |
|               | MILWAUKIE OR 97222                 | Date Analyzed: | 08/17/2020       |
| Collected:    | 08/11/2020                         | Date Reported: | 08/17/2020       |
| Project Name: | BSD-MONTCLAIR E.S. ROOF PROJECT    | EPA Method:    | EPA 600/R-93/116 |
| Address:      |                                    | Submitted By:  | MATT CUDA        |
|               |                                    | Collected By:  |                  |

| Lab ID<br>Client ID  | Sample<br>Location                               | Layer Name /<br>Sample Description        | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents              |
|----------------------|--|---|----------------------|----------------------|---|
| 0241380-008<br>M-02A | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM GYM<br>ROOF    | LAYER 1<br>Composite Roofing, Black/ Gray | No                   | None Detected        | Fibrous Glass 20%                         |
|                      |  |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80% |
|                      |  | LAYER 2<br>Composite Roofing, Black       | No                   | None Detected        | Fibrous Glass 20%                         |
|                      |  |   |                      |                      | Cellulose Fiber 5%                        |
|                      |  |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 75% |
|                      |  | LAYER 3<br>Tar, Black                     | No                   | None Detected        | Fibrous Glass 4%                          |
|                      |  |   |                      |                      | Cellulose Fiber 1%                        |
|                      |  |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 95% |
|                      |  |   |                      |                      |   |
| 0241380-009<br>M-02B | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM OFFICE<br>AREA | LAYER 1<br>Composite Roofing, Black/ Gray | No                   | None Detected        | Fibrous Glass 20%                         |
|                      |  |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80% |
|                      |  | LAYER 2<br>Composite Roofing, Black       | No                   | None Detected        | Fibrous Glass 20%                         |
|                      |  |   |                      |                      | Cellulose Fiber 5%                        |
|                      |  |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 75% |
|                      |  | LAYER 3<br>Tar, Black                     | No                   | None Detected        | Fibrous Glass 5%                          |
|                      |  |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 95% |
|                      |  |   |                      |                      |   |
|                      |  |   |                      |                      |   |

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Laboratory Report

**0241380**

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client: TRC SOLUTIONS Job# / P.O. #: 406451  
Address: 4105 SE INTERNATIONAL WAY, STE 505 Date Received: 08/12/2020  
MILWAUKIE OR 97222 Date Analyzed: 08/17/2020  
Collected: 08/11/2020 Date Reported: 08/17/2020  
Project Name: BSD-MONTCLAIR E.S. ROOF PROJECT EPA Method: EPA 600/R-93/116  
Address: Submitted By: MATT CUDA  
Collected By:

| Lab ID<br>Client ID  | Sample<br>Location                                | Layer Name /<br>Sample Description        | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents               |
|----------------------|---|---|----------------------|----------------------|--|
| 0241380-010<br>M-02C | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>CLASSRM AREA | LAYER 1<br>Composite Roofing, Black/ Gray | No                   | None Detected        | Fibrous Glass 20%                          |
|                      |   |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 80%  |
|                      |   | LAYER 2<br>Composite Roofing, Black       | No                   | None Detected        | Fibrous Glass 20%<br>Cellulose Fiber 5%    |
|                      |   |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 75%  |
|                      |   | LAYER 3<br>Tar, Black                     | No                   | None Detected        | Fibrous Glass 5%                           |
|                      |   |   |                      |                      | Carbonates<br>Quartz<br>Binder/Filler 95%  |
| 0241380-011<br>M-03A | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM GYM<br>ROOF     | Roof Paint, Silver                        | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler 100% |
|                      |   |   |                      |                      |  |
| 0241380-012<br>M-03B | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM OFFICE<br>AREA  | Roof Paint, Silver                        | No                   | None Detected        | Cellulose Fiber <1%                        |
|                      |   |   |                      |                      | Quartz<br>Carbonates<br>Binder/Filler 99%  |

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NVLAP#101926-0

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MILWAUKIE OR 97222 Date Analyzed: 08/17/2020  
Collected: 08/11/2020 Date Reported: 08/17/2020  
Project Name: BSD-MONTCLAIR E.S. ROOF PROJECT EPA Method: EPA 600/R-93/116  
Address: Submitted By: MATT CUDA  
Collected By:

| Lab ID<br>Client ID  | Sample<br>Location  | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                  |
|----------------------|---|------------------------------------|----------------------|----------------------|---|
| 0241380-013<br>M-03C | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>CLASSRM AREA           | Roof Paint, Silver                 | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100% |
| 0241380-014<br>M-04A | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>CAFETERIA ROOF         | Roof Caulking, White/ Gray         | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100% |
| 0241380-015<br>M-04B | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>HALLWAY/OFFICE<br>ROOF | Roof Caulking, White/ Gray         | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler<br>100% |
| 0241380-016<br>M-04C | THROUGHOUT<br>ROOF-SEE<br>DIAGRAM<br>CLASSRM ROOF<br>AREA   | Roof Caulking, White/ Gray         | No                   | None Detected        | Quartz<br>Carbonates<br>Binder/Filler<br>100% |

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0241380

## Bulk Asbestos Analysis by Polarized Light Microscopy

NVLAP#101926-0

Client: TRC SOLUTIONS Job# / P.O. #: 406451  
Address: 4105 SE INTERNATIONAL WAY, STE 505 Date Received: 08/12/2020  
MILWAUKIE OR 97222 Date Analyzed: 08/17/2020  
Collected: 08/11/2020 Date Reported: 08/17/2020  
Project Name: BSD-MONTCLAIR E.S. ROOF PROJECT EPA Method: EPA 600/R-93/116  
Address: Submitted By: MATT CUDA  
Collected By:

| Lab ID<br>Client ID  | Sample<br>Location                                   | Layer Name /<br>Sample Description | Asbestos<br>Detected | Asbestos Type<br>(%) | Non-Asbestos<br>Constituents                                     |
|----------------------|--|------------------------------------|----------------------|----------------------|--|
| 0241380-017<br>M-05A | THROUGHOUT-<br>SEE DIAGRAM<br>HALLWAY/OFFICE<br>ROOF | Roof Caulking, Black               | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler 100%                       |
| 0241380-018<br>M-05B | THROUGHOUT-<br>SEE DIAGRAM<br>ENTRY ROOF             | Roof Caulking, Black/ Blue         | No                   | None Detected        | Carbonates<br>Quartz<br>Binder/Filler 100%                       |
| 0241380-019<br>M-05C | THROUGHOUT-<br>SEE DIAGRAM<br>CLASSRM ROOF<br>AREA   | Roof Caulking, Black               | No                   | None Detected        | Cellulose Fiber <1%<br>Carbonates<br>Quartz<br>Binder/Filler 99% |



Analyst - Dustin White



Signatory - Lab Director - Kurt Kettler

Distinctly stratified, easily separable layers of samples are analyzed as subsamples of the whole and are reported separately for each discernible layer. All analyses are derived from calibrated visual estimate and measured in area percent unless otherwise noted. The report applies to the standards or procedures identified and to the sample(s) tested. The test results are not necessarily indicated or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. These reports are for the exclusive use of the addressed client and that they will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. The report shall not be reproduced except in full, without written approval by our laboratory. The samples not destroyed in testing are retained a maximum of thirty days. The laboratory measurement of uncertainty for the test method is approximately less than 1 by area percent. Accredited by the National Institute of Standards and Technology, Voluntary Laboratory Accreditation Program for selected test method for asbestos. The accreditation or any reports generated by this laboratory in no way constitutes or implies product certification, approval, or endorsement by the National Institute of Standards and Technology. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. Polarized Light Microscopy may not be consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials.

**CHAIN OF CUSTODY**

EMC Labs, Inc.  
9830 S. 51<sup>st</sup> St., Ste B-109  
Phoenix, AZ 85044  
(480) 940-5294 Fax (480) 893-1726

LAB#: 241380TAT: 3 DaysRec'd: AUG 12 P.M.COMPANY NAME: **TRC SOLUTIONS**Address: 4105 SE International Way, Suite 505Milwaukie, Oregon 97222CONTACT: Ron Landolt **Scan & Excel**Phone/Fax: (503) 387-3251 / (503) 908-1318Email: rlandolt@trcsolutions.com and mcuda@trcsolutions.com

BILL TO: (If Different Location)

Phoenix, AZNow Accepting: **VISA - MASTERCARD**

Price Quoted: \$ \_\_\_\_\_ / Sample \$ \_\_\_\_\_ / Layers

**COMPLETE ITEMS 1-4: (Failure to complete any items may cause a delay in processing or analyzing your samples)****1. TURNAROUND TIME:** [Same Day Rush] [1-2 Days] [3-4-5 Days] [6-10 Days]\*\*\*\*Prior confirmation of turnaround time is required

\*\*\*\*Additional charges for rush analysis (please call marketing department for pricing details)

\*\*\*\*Laboratory analysis may be subject to delay if credit terms are not met

**2. TYPE OF ANALYSIS:** [Bulk-PCM] [Air-PCM] [Lead] [Point Count] [Fungi: AOC, W-C, Bulk, Swab, Tape]**3. DISPOSAL INSTRUCTIONS:** [Dispose of samples at EMC] / [Return samples to me at my expense]

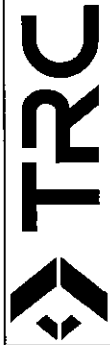
(If you do not indicate preference, EMC will dispose of samples 30 days from analysis.)

**4. Project Name:** BSD - Montclair E.S. Roof Project**P.O. Number:** \_\_\_\_\_ **Project Number:** 406451

| EMC<br>SAMPLE # | CLIENT<br>SAMPLE # | DATE & TIME<br>SAMPLED | LOCATION/MATERIAL<br>TYPE      | Samples<br>Accepted<br>Yes / No | AIR SAMPLE INFO / COMMENTS |     |              |
|-----------------|--------------------|------------------------|--------------------------------|---------------------------------|----------------------------|-----|--------------|
|                 |                    |                        |                                |                                 | ON                         | OFF | FLOW<br>RATE |
| <u>1</u>        | <u>M-01A</u>       | <u>8-11-20</u>         | <u>See Attached Field Logs</u> | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
| <u>19</u>       | <u>M-05C</u>       |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |
|                 |                    |                        |                                | <u>Y</u> N                      |                            |     |              |

**SPECIAL INSTRUCTIONS:**Sample Collector: (Print) Matt Cyda(Signature) [Signature]Relinquished by: [Signature] Date/Time: 8-11-20 1520 Received by: Diana Federico Date/Time: 8/12/20Relinquished by: Diana Federico Date/Time: 8/12/20 Received by: [Signature] Date/Time: 8/12/20Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: 10/1/20

\*\* In the event of any dispute between the above parties for these services or otherwise, parties agree that jurisdiction and venue will be in Phoenix, Arizona and prevailing party will be entitled to attorney's fees and court costs.



4105 SE International Way, Suite 505,  
Milwaukie, OR 97222

## ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM

|   |  |                            |
|---|--|----------------------------|
| Client:<br>Beaverton School District  | Project Number:<br>406451                  | Inspector(s):<br>Matt Cuda |
| Project Name:<br>BSD - Montclair Elementary School Roof<br>Project<br>Montclair Elementary School<br>7250 SW Vermont Street<br>Portland, Oregon 97223 | Tracking Number:                           | Requested TAT:<br>3 DAY    |
| Email Results to:<br>mcuda@trccompanies.com,<br>rlandolt@trccompanies.com   | Analytical Method:<br>PLM EPA 600/R-93/116 | Lab Comments:              |

### ASBESTOS BULK SAMPLE INFORMATION

| Date Collected | Sample Identification | Material Description                 | Homogeneous Area | Sample Location             | Lab Identification (Lab Use Only) |
|----------------|-----------------------|--------------------------------------|------------------|-----------------------------|-----------------------------------|
| 2020-08-11     | M-01A                 | Built-up Roofing with Gravel Overlay | Throughout Roof  | See Diagram Cafeteria Area  |                                   |
| 2020-08-11     | M-01B                 | Built-up Roofing with Gravel Overlay | Throughout Roof  | See Diagram Main Entry Area |                                   |
| 2020-08-11     | M-01C                 | Built-up Roofing with Gravel Overlay | Throughout Roof  | See Diagram Classroom area  |                                   |
| 2020-08-11     | M-01D                 | Built-up Roofing with Gravel Overlay | Throughout Roof  | See Diagram Classroom Area  |                                   |
| 2020-08-11     | M-01E                 | Built-up Roofing with Gravel Overlay | Throughout Roof  | See Diagram Gym roof        |                                   |
| 2020-08-11     | M-01F                 | Built-up Roofing with Gravel Overlay | Throughout Roof  | See Diagram Gym Roof        |                                   |

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| Date Collected                     | Sample Identification | Material Description                 | Homogeneous Area | Sample Location                   | Lab Identification (Lab Use Only) |
|------------------------------------|-----------------------|--------------------------------------|------------------|-----------------------------------|-----------------------------------|
| 2020-08-11                         | M-01G                 | Built-up Roofing with Gravel Overlay | Throughout Roof  | See Diagram Covered play area     |                                   |
| 2020-08-11                         | M-02A                 | Composite Roofing                    | Throughout Roof  | See Diagram Gym roof              |                                   |
| 2020-08-11                         | M-02B                 | Composite Roofing                    | Throughout Roof  | See Diagram office area           |                                   |
| 2020-08-11                         | M-02C                 | Composite Roofing                    | Throughout Roof  | See Diagram Classroom Area        |                                   |
| 2020-08-11                         | M-03A                 | Silver Roof Paint                    | Throughout Roof  | See Diagram Gym Roof              |                                   |
| 2020-08-11                         | M-03B                 | Silver Roof Paint                    | Throughout Roof  | See Diagram Office Area           |                                   |
| 2020-08-11                         | M-03C                 | Silver Roof Paint                    | Throughout Roof  | See Diagram Classroom area        |                                   |
| 2020-08-11                         | M-04A                 | White/ Gray Roof Caulking            | Throughout Roof  | See Diagram cafeteria Roof        |                                   |
| 2020-08-11                         | M-04B                 | White/ Gray Roof Caulking            | Throughout Roof  | See Diagram Hallway/ Office Roof  |                                   |
| 2020-08-11                         | M-04C                 | White/ Gray Roof Caulking            | Throughout Roof  | See Diagram - Classroom Roof Area |                                   |
| 2020-08-11                         | M-05A                 | Black Roof Caulking                  | Throughout       | See Diagram Hallway/ Office Roof  |                                   |
| 2020-08-11                         | M-05B                 | Black Roof Caulking                  | Throughout       | See Diagram Entry Roof            |                                   |
| 2020-08-11                         | M-05C                 | Black Roof Caulking                  | Throughout       | See Diagram - Classroom Roof Area |                                   |
| Special Instruction to Laboratory: |                       |                                      |                  |                                   |                                   |
| N/A                                |                       |                                      |                  |                                   |                                   |

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| Relinquished By:  |  | Date       | Time         | Received By:   |  | Date    | Time    |
|---|--|------------|--------------|--|--|---------|---------|
| I. (Print): Matt Cuda   |  | 2020-08-11 | 14:56:22 PDT | I. (Print): Diana Federico   |  | 8/12/20 | 9:15 am |
| (Sign):  |  |            |              | (Sign): Diana Federico   |  |         |         |
| II. (Print): Diana Federico   |  | 8/12/20    | 4p           | II. (Print): Diana Federico  |  | 8/12/20 | 4p      |
| (Sign):  |  |            |              | (Sign):  |  |         |         |

## **Appendix C – Inspector Certification(s)**

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# ***The Environmental Institute***

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## *Matthew Cuda*

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Social Security Number - XXX-XX-8274

TRC - 4105 SE International Way - Milwaukie, OR 97222

*Has completed 4 hours of coursework and satisfactorily  
passed an examination that meets all criteria required for  
EPA/AHERA/ASHARA (TSCA Title II) Approved Reaccreditation*

### *Asbestos in Buildings: Inspector Refresher*

*January 31, 2020*

Course Date

*17792*

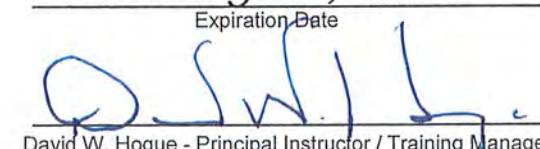
Certificate Number

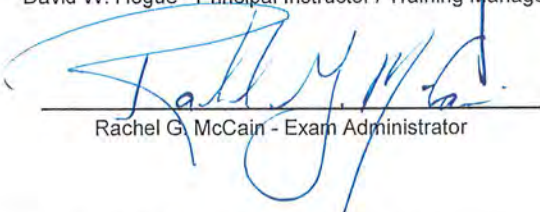
*January 31, 2020*

Examination Date

*January 30, 2021*

Expiration Date

  
David W. Hogue - Principal Instructor / Training Manager

  
Rachel G. McCain - Exam Administrator



(Approved by the ABIH Certification Maintenance Committee for 1/2 CM point - Approval #11-577)

(Florida Provider Registration Number FL49-0001342 - Course #FL49-0002805)

TEI - 1395 S. Marietta Parkway SE - Building 100, Suite 124 - Marietta, GA 30067

Phone: 770-427-3600 - Website: [www.tei-atl.com](http://www.tei-atl.com)

## SECTION 061000 - ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Wood blocking, cants, and nailers.
  - 5. Wood furring.
  - 6. Wood sleepers.

#### 1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. OSB: Oriented strand board.
- E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
  - 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.

## 2.3 DIMENSION LUMBER FRAMING

A. Ceiling Joists: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WWP.

B. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

1. Species:
  - a. Douglas fir; WCLIB or WWP.

C. Exposed Framing Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Species and Grade: As indicated above for load-bearing construction of same type.

## 2.4 ENGINEERED WOOD PRODUCTS

A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2600 psi (17.9 MPa for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).

B. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).

- C. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055.
  - 1. Web Material: Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
  - 2. Structural Properties: Depths and design values not less than those indicated.
  - 3. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.
- D. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.
  - 1. Manufacturer: Provide products by same manufacturer as I-joists.
  - 2. Material: product made from any combination solid lumber, wood strands, and veneers.
  - 3. Thickness: as indicated.
  - 4. Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Rooftop equipment bases and support curbs.
  - 4. Cants.
  - 5. Furring.
- B. Dimension Lumber Items: No. 2 grade lumber of any of the following species:
  - 1. Hem-fir; WCLIB or WWPA.
  - 2. Douglas fir-larch; WCLIB or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
  - 1. Douglas fir-larch; No. 2 grade WCLIB or WWPA
  - 2. Hem-fir No. 2 grade: WCLIB, or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

**2.6 FASTENERS**

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

**2.7 METAL FRAMING ANCHORS**

- A. Allowable design loads, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  - 1. Use for wood-preservative-treated lumber and where indicated.
- D. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304
  - 1. Use for exterior locations and where indicated.

**2.8 MISCELLANEOUS MATERIALS**

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.



**PART 3 - EXECUTION****3.1 INSTALLATION, GENERAL**

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- D. Install metal framing anchors to comply with manufacturer's written instructions.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- H. Comply with AWWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - 2. ICC-ES evaluation report for fastener.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
  - 1. Comply with indicated fastener patterns where applicable.

2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### 3.3 INSTALLATION OF WOOD FURRING

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring vertically at 24 inches (610 mm) o.c.

### 3.4 INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

- A. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.5 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

## SECTION 075323 – EPDM MEMBRANE ROOFING AND RELATED SHEET METAL

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Mechanically attached EPDM membrane roofing system.
- B. Polyiso Insulation and High Density Polyiso Cover Board.
- C. Sheet Metal Flashing and Trim:
  - 1. Formed roof-drainage sheet metal fabrications.
  - 2. Formed low-slope roof sheet metal flashings.
  - 3. Formed wall sheet metal fabrications.
  - 4. Formed equipment support flashings.
  - 5. Sheet metal counter flashing.
- D. Miscellaneous materials.
- E. Removal of existing roofing system.

#### 1.2 REFERENCES

- A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms used in this Section:
  - 1. ASTM D 1079 “Standard Terminology Relating to Roofing and Waterproofing.”
  - 2. Glossary of NRCA's "The NRCA Roofing Manual."
  - 3. Roof Consultants Institute “Glossary of Roofing Terms.”
- B. Sheet Metal Terminology and Techniques: SMACNA “Architectural Sheet Metal Manual.”

#### 1.3 DESIGN CRITERIA

- A. General: Installed roofing membrane systems to remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials to be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Installer to comply with current code requirements based on Authority Having Jurisdiction.

Project Number: **20Y082.01**

- D. Wind Uplift Performance: Roofing system to be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.
- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Materials to be identified with appropriate markings of applicable testing and inspecting agency.
  - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

#### 1.4 SUBMITTALS

##### A. Moisture Mitigation Plan Submittal:

- 1. Contractor shall prepare and submit a 3-part moisture mitigation plan to address potential inclement weather and for District and Architect approval prior to commencement of work. The moisture mitigation plan shall include the following:
  - 2. Part 1: Prevention
    - a. Contractor's protocol for obtaining and reviewing weather forecast during construction and disseminating forecasted weather information and concerns to the Project Team. Include weather forecast source, intervals at which the forecast will be reviewed and the Contractor's method for disseminating forecasted weather-related impacts or concerns to the Project Team.
    - b. Contractor's protocol for weatherizing building at end of each work day
      - 1) Include a roof plan showing areas where temporary weatherization are to be employed with detailed information of materials and techniques used to achieve temporary weatherization. Provide drawing details as needed to clarify intent and reference details on plan. If re-roof is to be phased, submit requested roof plan for each phase
      - 2) Provide a list of key members of the Construction team involved with end-of-day weatherization and their associated roles and responsibilities (e.g., Those responsible for performing the work, those responsible for overseeing work being performed, those responsible for a quality control check after work is completed, etc.)
    - c. Provide list of equipment and where it is to be stored on-site for full project duration and for the sole purpose of deploying during a wet weather emergency to help minimize immediate wet weather affects to unprotected surfaces and affected interior areas.
    - d. Contractor's Action Plan (To be posted in job trailer or other District-approved location): Provide an organized and cohesive Action Plan for addressing wet weather intrusion. A separate Action Plan shall be provided for each of two scenarios:
      - 1) Scenario A: Wet weather is encountered during the workday with appointed staff available to respond immediately.
      - 2) Scenario B: Wet weather is encountered during off-work hours with few or no appointed construction staff on site.

- 3) For each of the above scenarios, include in the Action Plan (at a minimum) the following:
    - a) Response Team: Appoint a wet weather Response Team capable of adequately implementing contractor's Action Plan. This team shall consist of selected Contractor's staff and those of subcontractors as needed at Contractor's discretion. In addition, the District will provide a list of District and School staff to be included as part of the Response Team. Provide a list for each member of the Response Team and include emergency contact information for each, including name, role, phone number and e-mail address. Include in this list and identify at least one member of Contractor's appointed Response Team who can be reached on a 24-hour, seven days-per-week basis.
    - b) Stakeholder Contact List: The District will provide a list of District stakeholders to be contacted in the event of wet weather intrusion into the building for Contractor's integration with the Action Plan.
    - c) Location of dehumidifying equipment, drip buckets, absorbing blankets, moisture absorbing media, etc. to be employed if unprotected exterior surfaces are exposed to moisture and/or if moisture has penetrated the building envelope into the building's interior. Include instructions for locating and operating equipment if required. Refer to Item Part 1.c above for Contractor's list of equipment and materials to be stored on-site.
    - d) Sequence of Operations: Develop a Sequence of Operations for employing the Action Plan, including prioritizing the individuals to be notified upon implementation of the Action Plan and steps required to ensure moisture mitigation measures' effectiveness throughout the course of the wet weather event. As part of this sequence of operations identify the source and contact information for those responsible in supplying additional moisture mitigation equipment and materials if needed to address significant or prolonged wet weather event.
  - e. Contractor's method for educating Contractor and Subcontractor staff of Moisture Mitigation Plan, including Action Plan, and gaging such staff's preparedness to execute the Contractor's Action Plan.
3. Part 2: Immediate Response
    - a. Provide written protocol for implementing Action Plan for both scenarios identified above.
  4. Part 3: Moisture and Mold Mitigation
    - a. Identify Contractor's protocol for quantifying wet weather related impact to exposed exterior surfaces and interior spaces and how Contractor intends to disseminate this information to The District and Architect. Include description of technologies to be employed for moisture detection in concealed and unconcealed locations. Initial verbal notification to the Owner and Architect shall take place within 24 hours of a water intrusion event.
    - b. Identify measures to be taken after immediate wet weather event to ensure continued moisture and mold mitigation response. Include Contractor's protocol for drying and/or cleaning of school assets impacted by wet weather, including electronics, books, classroom and office furniture, etc.

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- c. Describe the conditions under which Contractor-provided moisture and mold mitigation equipment and materials/supplies would be disengaged following a wet weather intrusion.
  - d. Provide written confirmation that Contractor intends to work collaboratively with and support an Owner or Architect-contracted industrial hygienist or other moisture and mold mitigation expert. Such subcontractor may be hired at Owner's discretion to help quantify the locations and effects of wet weather related impacts for Contractor remediation.
  - e. Outline Contractor's protocol for wet weather-related clean up.
- B. Product Data: Manufacturer's data sheets for each product to be provided.
- C. Roof Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:
  - 1. Base flashings, cants, and membrane terminations.
  - 2. Tapered insulation, including slopes. Provide complete set of tapered insulation shop drawings. Basis-of-Design Service Provider Requirement: Tapered Design; [www.tapereddesign.com](http://www.tapereddesign.com).
  - 3. Crickets, saddles, and tapered edge strips, including slopes.
  - 4. Insulation fastening patterns.
- D. Tapered Insulation – Shop Drawings: Provide comprehensive panel layout of roof plans and sections as required to identify slopes in regard to hips, valley's, ridges and to all drain locations. Identify thickness of insulation in relation to all applicable existing conditions to include curb mounted equipment, parapet heights, door and structure elevation impacts, potential obstructions and ponding issues.
- E. Sheet Metal Detail Drawings:
  - 1. Include plans, elevations, sections and attachment details.
  - 2. Distinguish between shop and field assembly work.
  - 3. Include identification of finish for each item.
  - 4. Include pattern of seams and details of termination points, expansion joints and expansion joint covers, direction of expansion, roof penetration flashing, and connections to adjoining work.
- F. Verification Samples: Provide for each product specified.
- G. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- H. Maintenance Data: Refer to Johns Manville's latest published documents at [www.JM.com](http://www.JM.com).
- I. Warranty: Provide manufacturer's current warranty specimen.
- J. Prior to roofing system installation, roofing sub-contractor to provide a copy of the Warranty Application Confirmation document issued by the manufacturer indicating that the project has been reviewed for eligibility to receive the specified warranty and registered.

**1.5 QUALITY ASSURANCE**

- A. **Installer Qualifications:** Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's warranty with a minimum of five years of experience with work of this type.
- B. **Manufacturer Qualifications:** Qualified manufacturer that has previous applications for roofing system identical to that used for this Project with a minimum of 10 years of experience providing roofing systems of this type.
- C. **Testing Agency Qualifications:** An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E329.
- D. **Source Limitations:** Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system to be labeled by the single source roofing manufacturer issuing the warranty.
- E. **Fire-Test-Response Characteristics:** Roofing materials to comply with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

**1.7 PROJECT CONDITIONS**

- A. **Weather Limitations:** Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

- A. Manufacturer Warranty: Provide manufacturer's 25-year total system warranty, No Dollar Limit Roofing System Warranty.
  - 1. Single-source special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
- B. Installer's Warranty: Submit roofing Installer's warranty for the following warranty period:
  - 1. Warranty Period: 2-years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: Johns Manville
- B. Firestone
- C. Carlisle

2.2 ETHYLENE PROPYLENE DIENE MONOMER ROOFING MEMBRANE - EPDM

- A. Scrim or fabric internally reinforced uniform, flexible sheet made from Ethylene Propylene Diene Monomer, ASTM D 4637, Type II.
  - 1. Thickness (nominal): 75 mils
  - 2. Exposed Face Color: Black.
  - 3. Factory Inseam Tape: 6-inch wide minimum, butyl splice tape with release film.

2.3 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
  - 1. Liquid-type auxiliary materials to meet VOC limits of Authorities Having Jurisdiction.
- B. Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.
- C. Primer Material: Manufacturer's standard synthetic-rubber polymer primer.



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- D. Liquid Applied Flashing: Manufacturer's single ply liquid and fabric reinforced flashing system created with a fleece polyester scrim and a two-component polyurethane based liquid applied flashing material, consisting of a liquid resin and a curing agent.
- E. Liquid Applied Flashing Primer: Manufacturer's single ply liquid flashing primer.
- F. Seaming Material: Manufacturer's standard 6-inch-wide minimum, butyl splice tape with release film.
- G. Sealing Strip: Manufacturer's standard 6-inch, 9-inch, or 12-inch wide, 45 mil thick minimum, cured EPDM with factory-laminated, self-adhering seam tape.
- H. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
  - 1. Serviceable Installation Ambient Air Temperature: 25°F and rising.
- I. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.
- J. Membrane Battens: Manufacturer's standard polymer or aluminum-zinc-alloy-coated steel sheet, pre-punched.
- K. Membrane Fasteners and Plates: Factory-coated steel fasteners and galvalume coated steel plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening EPDM membrane to substrate, and acceptable to membrane roofing system manufacturer. #15 High Load Fasteners and APB Steel Membrane Plates, or #14 All Purpose Fasteners and APB Steel Membrane Plates.
- L. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, termination reglets, T-joint cover, cover strips, sealants and other accessories.

## 2.4 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi).
  - 1. Provide insulation package in 2-layers of 2.6-inch flat stock, resulting in a combined LTTR-Value 30.
  - 2. Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch, as determined in accordance with CAN/ULC S770 at 75°F (24°C).

## 2.5 TAPERED INSULATION AND/OR CRICKETING MATERIALS

- A. Tapered Insulation and/or Crickets Materials: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated on Drawings.

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- A. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs. of compressive strength.
  - 1. Thickness: 1/2 inch.
  - 2. LTTR-Value: 2.5.

**2.7 INSULATION ACCESSORIES**

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer.
- D. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate, where/if required.
- E. Wood Nailer Strips.

**2.8 VAPOR BARRIER**

- A. Self-Adhered SBS Vapor Retarder: Tri-laminate woven polyethylene, nonslip UV protected top surface; suitable for application method specified.

**2.9 EDGE METAL COMPONENTS**

- A. Coping Metal System at Parapet Wall Conditions: Provide manufacturer's factory fabricated metal coping consisting of anchor bar and a snap-on cap components. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit warranty.
- B. All exposed sheet metal flashing to be minimum 24 gauge with Kynar 500 or Hylar 5000. Match existing colors.
- C. Drip & Rake Edge Metal Components: Provide drip and rake edge components where required, including at gutter drip edge conditions. Drip and rake edge components to include a continuous cleat on the outside exterior edge.

**2.10 WALKWAYS**

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer.

**2.11 MISCELLANEOUS MATERIALS**

- A. General: Provide materials and types of fasteners, solder, clinch lock, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Roof Drain Strainer Cover: Replace damaged roof drain strainer covers. Replacement covers to be cast iron only.
- C. Fasteners: Wood screws, annular threaded nails, self-tapping screws, bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  - 1. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
  - 2. Fasteners for Zinc Coated (galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.
- D. Solder - For Stainless Steel: ASTM B32, Grade Sn96, with acid flux of type recommended by stainless steel sheet manufacturer.
- E. Butyl Sealant Tape: 100 percent solids, asbestos free, butyl sealant tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch (13 mm) wide and 1/8 inch (3 mm) thick.
  - 1. Manufacturer: Schnee Morehead, Inc.; SM5227 Tacky Tape Sealant.

**PART 3 - EXECUTION****3.1 EXAMINATION GENERAL**

- A. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
- B. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses and elevation height of insulation and/or cover board materials.

**3.2 RE-ROOF PREPARATION: ROOF "A" MECHANICALLY ATTACHED**

- A. Overall Roof and Key Plan: Refer to Drawings, including Key Plan and Overall Roof Plan, for identification of roof related work that falls under this specification.

- B. Existing BUR Roofing System to Be Removed: The existing roofing system is to be completely removed down to the roof deck substrate. Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc. Existing Roof Core Results: Existing roof system consists of one (1) Tremco BUR roof system w/pea-gravel and insulation over plywood roof deck substrate. Maximum thickness is approximately 5".
- C. Existing Roof Base Flashings: Tear out, remove, and discard of all existing roof base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of the new roofing system.
- D. Abandoned Equipment and/or Penetrations: Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations. Where/if necessary to infill, install new plywood roof deck sheathing. New sheathing to match existing.
- E. Existing Equipment Curbs: Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
  - 1. Modify curbs as required to provide a minimum 8-inch base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
  - 2. Secure top of flashing and install new metal counterflashing prior to re-installation of unit.
- F. Remove Debris Prior to New Roof Installation: Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to new roofing installation and in accordance with roofing system manufacturer's written instructions. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove all debris from roof surface prior to new roof installation. Demolished roof system materials may not be stored on the roof surface.
- G. Unsatisfactory Conditions: Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 VAPOR-RETARDER INSTALLATION

- A. Vapor Barrier SAR Membrane: Adhere Vapor Barrier SAR directly over the plywood roof deck substrate. Vapor Barrier SAR is a self-adhering membrane. Note: Priming of the roof deck substrate is not required.

### 3.4 FLAT STOCK AND TAPERED INSULATION INSTALLATION

- A. Protection: Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing insulation materials.
- C. Flat Stock Insulation 2-Layers 2.6-inch: Install 2-layers of 2.6-inch Flat Stock Insulation directly over the previously installed vapor barrier membrane. Combined flat stock insulation materials to equate to a minimum LTTR-30. Materials are initially loose-laid into position.

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- D. Tapered Insulation and/or Tapered Cricketing Materials: Where defined on the Drawings, install tapered insulation and/or tapered cricketing materials under area of roofing to conform to slopes indicated. Materials are initially loose-laid into position.
- E. Staggered Joints Insulation Board: Install insulation boards with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch with cover board.
  - 1. Cut and fit insulation board within 1/4 inch of nailers, projections, and penetrations.
- F. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

### 3.5 COVER BOARD INSTALLATION

- A. Protection: Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Manufacturer Installation Instructions: Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. 1/2-inch HD Polyiso Cover Board – Mechanically Fastened: Mechanically attach cover board and underlying insulation boards in one pass to the plywood roof deck substrate using Insulation Fasteners and Plates. Fastening density to be a minimum of 5 fasteners and plates per 4' x 8' panel at field/perimeter/corner locations.
- D. Staggered Joints Cover Board: Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch with cover board.
  - 1. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations.
- E. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

### 3.6 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
- B. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
  - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.7 MECHANICALLY FASTENED EPDM ROOFING MEMBRANE INSTALLATION

- A. Install EPDM Reinforced 75-mil – FIT roofing membrane over area to receive roofing in accordance with roofing system manufacturer's written instructions.
  1. Unroll roofing membrane and allow to relax before installing.
  2. Install sheet in accordance with roofing system manufacturer's written instructions.
- B. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- D. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- E. Tape to Standard Mechanically Attached Sheet Installation: Align membrane for appropriate overlap, clean and prime non-taped face of splice area, remove release liners and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation.
  1. Align primary sheet with perforated seam tape up.
  2. Remove center strip of release liner to expose adhesive tape.
  3. Install Batten Bar over exposed adhesive and fasten to deck through predrilled holes at 12-inches on center.
  4. Align top sheet over fastened lower sheet as required to expose 1/4-inch of lower tape.
  5. Remove release liners in tandem, and roll seam with hard rubber roller.
  6. Roll across the seam at a 45-degree angle with a hard rubber roller using maximum hand pressure.
- F. Perimeter and Corner Membrane Enhancements: Perimeter and corner membrane enhancements are required at all exposed roof edge perimeters and corners, and where roof elevation heights are 10-feet or more above adjacent roof elevation heights.
  1. Formulas for determining dimensions of perimeters and corners are as follows: Use 10% of the lesser plan dimension, or 40% of the roof elevation height, whichever is the lesser.
  2. Use EPDM 10-inch wide Reinforced Perimeter Strip (RPS) for creating perimeter sheet and corner enhancements and for securing the roof membrane from beneath.
- G. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

**3.8 MEMBRANE BASE FLASHING INSTALLATION**

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates in accordance with membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

**3.9 DRIP AND RAKE EDGE FLASHINGS**

- A. Drip and Rake Edge Metal Flashings: At drip and rake edge conditions, including where gutter conditions exist, install new drip and rake edge metal flashings where required.
- B. Drip and rake edge materials to incorporate a continuous cleat installed on the outside vertical face.
- C. Flash in and make watertight using 6-inch wide EPDM Sealing Strip.
- D. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

**3.10 COPING METAL AT PARAPET WALL CONDITIONS**

- A. At parapet wall conditions where coping metal is required, install new coping metal materials.
- B. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

**3.11 WALKWAY PAD INSTALLATION**

- A. Self-Adhering Walkway Pads: Install self-adhering walkway pad products at locations indicated on Drawings. EPDM roofing membrane is to first be primed with Tape Primer prior to adhering walkway materials in accordance with manufacturer's written instructions.

**3.12 SPECIAL CONDITIONS AT COVERED PLAY AREA: ROOF "B" FULLY ADHERED**

- A. Fastener Penetration Not Permitted at open and exposed Play Area Roofs: Fastener penetration through the plywood roof deck substrate is not permitted at exposed Covered Play Area Roofs.
- B. Roof Deck Substrate: Plywood roof deck substrate.

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- C. Existing BUR Roofing System to be Removed: At Play Area Roofs, the existing BUR roofing system is to be completely removed down to the wood roof deck substrate. Existing base flashings to be removed, and curb and wall substrates properly prepared for new membrane base flashing materials. Note: Existing roof consists of one (1) Tremco BUR roof system w/pea-gravel and wood fiber cover board over plywood roof deck substrate. Maximum thickness is approximately 1-inch.
- D. Wood Nailers: 1/2-inch thick wood nailers are required at all drip and rake edge conditions. Where existing materials are in poor condition or do not currently exist, install new wood nailer materials.
- E. 1/2-inch HD Polyiso Cover Board – Adhered Direct to Wood Deck with Two-Part Urethane Insulation Adhesive: Adhere cover board directly to wood roof deck substrate using Two-Part Urethane Insulation Adhesive at a bead spacing density of 12/6/4 inches on center at field/perimeter/corner locations.
- F. EPDM R 75-mil FIT SYSTEMS – Adhered: Adhere EPDM 75-mil thick membrane over the previously installed cover board materials. Membrane to be adhered with Membrane Bonding Adhesive – Solvent Based.
- G. EPDM R 75-mil Membrane Base Flashings at Curb & Wall Conditions – Adhered: Proceed to adhere new EPDM 75-mil membrane base flashings at all curb and wall conditions. Membrane to be adhered with Membrane Bonding Adhesive – Solvent Based.
- H. Drip, Rake Edge, and/or Coping Metal Materials – Where Required: Install new Drip Edge, Rake Edge, and/or Coping Metal flashing materials where required. Edge metal flashings to incorporate a continuous cleat on the outside vertical face. Refer to Drawings for additional information on locations, types of materials, and dimensions, where these materials are required.

### 3.13 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.
  - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- B. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

### 3.14 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075323

EPDM MEMBRANE ROOFING AND RELATED SHEET METAL

SECTION 075323 -





**TECH/NORTHWEST, INC.**

ROOF CONSULTING, MOISTURE TESTING & ANALYSIS

# **ROOF INSPECTION REPORT**

*(Limited Visual Inspection)*

*Conducted For:*

**BEAVERTON SCHOOL DISTRICT**

Beaverton, Oregon

*Facility Inspected:*

**Elmonica Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary**

**Project Number: 20054**

**March 16, 2020**



## ROOF INSPECTION REPORT

*(Limited – Visual)*

**Inspection Date:** March 16, 2020  
**Project #:** 20054

**Inspection #:** V-01  
**Report Date:** 3/26/20

**Company:** BEAVERTON SCHOOL DISTRICT  
16550 SW Merlo Road  
Beaverton, OR 97003-5152

**Attn:** Megan Finch  
Project Manager  
503-356-4587  
[Megan\\_Finch@beaverton.k12.or.us](mailto:Megan_Finch@beaverton.k12.or.us)

**Inspected Facility:**  
Elmonico Elementary  
Errol Hassell Elementary  
Hiteon Elementary  
Montclair Elementary  
Jacob Wismer Elementary

**Present at Inspection:**  
Megan Finch..... Beaverton School District  
Patrick Schmautz..... A-Tech/Northwest, Inc.  
Doug Coddington..... A-Tech/Northwest, Inc.

### **PART I - DISCUSSION**

#### **A. PURPOSE:**

1. The purpose of the inspection is to review the existing condition of the roofs at the five (5) schools.
  - a. The available history of the building is minimal. This report is based on the information supplied and this visual inspection.
  - b. One (1) core sample was cut at each school to determine the general roof construction / component data.
2. The following is a summary review of the results of this inspection.

#### **B. GENERAL ROOF/BUILDING INFORMATION:** *(Refer to as-built drawings for Roof ID's)*

##### **1. Elmonica Elementary School – Modular Building**

###### **a. Built-up Roofs (Roofs I-DD):**

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2003 (*17 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

2. Errol Hassell Elementary School – Modular Building

a. Built-up Roofs (Roofs I-V):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... Reported to be 2001 or 2009 (*11 or 19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

3. Hiteon Elementary School

a. Built-up Roofs (Roofs A-L):

- (1) Roof Type:..... Pea Gravel Built-up Roof (*Roof-over-roof*)
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... ½" Fiberboard Top Roof (*R Value 1.4 approx.*)  
¾" Perlite Bottom Roof (*R-Value 2 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2004 (*16 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

4. Montclair Elementary School

a. Built-up Roofs (Roofs A-H):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2009 (*11 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

5. Jacob Wismer Elementary School

a. Built-up Roofs (Roofs A-I):

- (1) Roof Type:..... Pea Gravel Built-up Roof
- (2) Manufacturer:..... Tremco
- (3) Insulation:..... 2" Fiberboard (*R Value 5 approx.*)  
2 ½" Polyisocyanurate (*R-Value 14 approx.*)
- (4) Deck:..... Plywood
- (5) Age: ..... 2001 (*19 years*)
- (6) Warranty: ..... Unknown
- (7) Contractor: ..... Unknown
- (8) General Condition: ..... Fair

### **C. INTERIOR LEAKAGE:**

1. Elmonica Elementary School:
  - a. No current interior leakage reported. Previous interior leakage reported at equipment at a few locations.
2. Errol Hassell Elementary School:
  - a. Current interior leakage at repair area at northeast section of the building. Previous interior leakage reported at a few pipes in the roof field.
3. Hiteon Elementary School:
  - a. No current interior leakage reported.
4. Montclair Elementary School:
  - a. Current interior leakage reported at several locations.
5. Jacob Wismer Elementary School:
  - a. Current interior leakage reported along parapet at southwest section of the building and at west section of the building.

## **PART II - RE-ROOF OPTIONS**

### **A. Single-ply Roof System Types Recommended: (in the following order)**

1. Mechanically attached TPO (minimum 60 mil).
2. Fully adhered TPO (minimum 60 mil).
3. Mechanically attached EPDM (minimum 60 mil).
4. Fully adhered EPDM (minimum 60 mil).

### **B. Coating:**

1. Coating is **not** recommended for these roofs due to gravel and condition of the existing roofs.

## **PART III – BUDGET ESTIMATE**

### **A. Remove and Replace:**

|   |                                    |
|---|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 500,000.00 to \$ 550,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 300,000.00 to \$ 350,000.00     |
| 3. Hiteon Elementary School: .....        | \$ 1,260,000.00 to \$ 1,550,000.00 |
| 4. Montclair Elementary School: .....     | \$ 1,100,000.00 to \$ 1,350,000.00 |
| 5. Jacob Wismer Elementary School: .....  | \$ 1,300,000.00 to \$ 1,600,000.00 |

### **B. Recover:**

|   |                                    |
|---|------------------------------------|
| 1. Elmonica Elementary School: .....      | \$ 460,000.00 to \$ 490,000.00     |
| 2. Errol Hassell Elementary School: ..... | \$ 270,000.00 to \$ 290,000.00     |
| 3. Hiteon Elementary School: .....        | n/a (roof-over-roof)               |
| 4. Montclair Elementary School: .....     | \$ 850,000.00 to \$ 1,000,000.00   |
| 5. Jacob Wismer Elementary School: .....  | \$ 1,000,000.00 to \$ 1,200,000.00 |



If you have any questions concerning this inspection and/or the report, please contact our office.  
The opportunity to submit this information is appreciated.

Respectfully submitted,

**A-Tech/Northwest, Inc.**

*Doug Coddington* (electronic)

Doug Coddington, RCI  
Vice President

Attachment: Photo Section  
As-Built Drawings

Copy to: Master Files

**- End of Report -**



**EE. 1.01 – View to south of the front elevation of Elmonica Elementary school.**



**EE. 1.02 – View to northeast of roof top equipment at the north section of roof.**

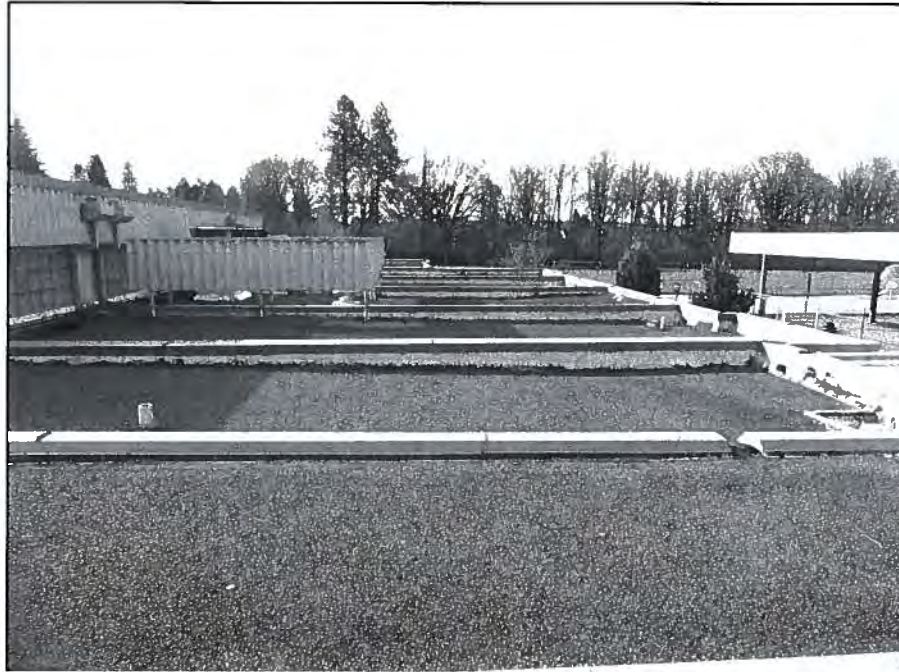




**EE. 1.03 – View of typical roof drain & overflow scupper with previous repairs starting to fail.**



**EE. 1.04 – View to the south of the upper section of the roof.**



**EE. 1.05 – View to the west of the north section of the roof.**



**EHE. 1.01 – View to south of the front elevation of Errol Hassell Elementary school.**

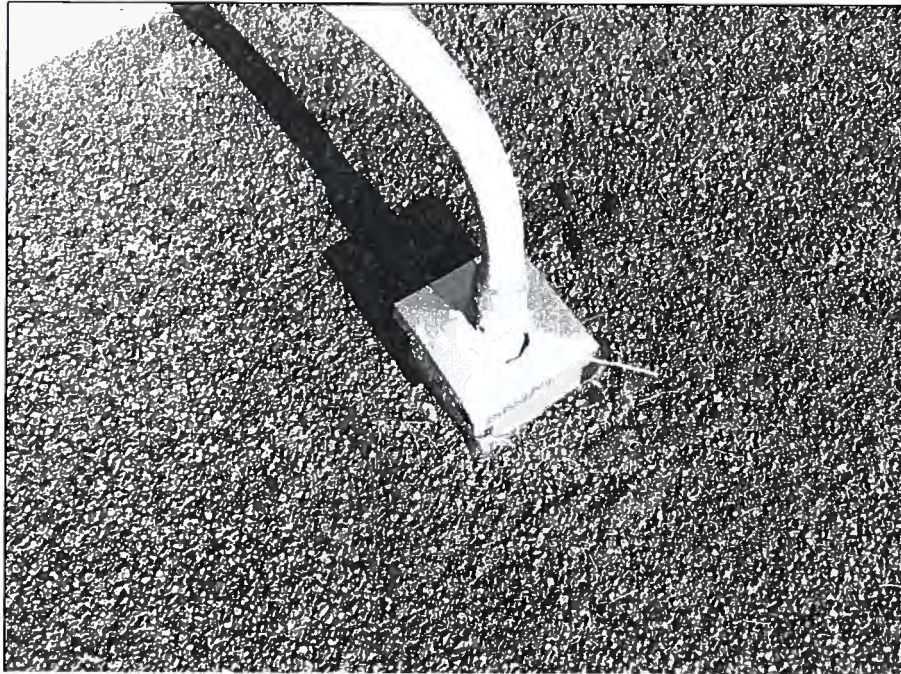




**EHE. 1.02 – View to the west of the north section of the roof.**



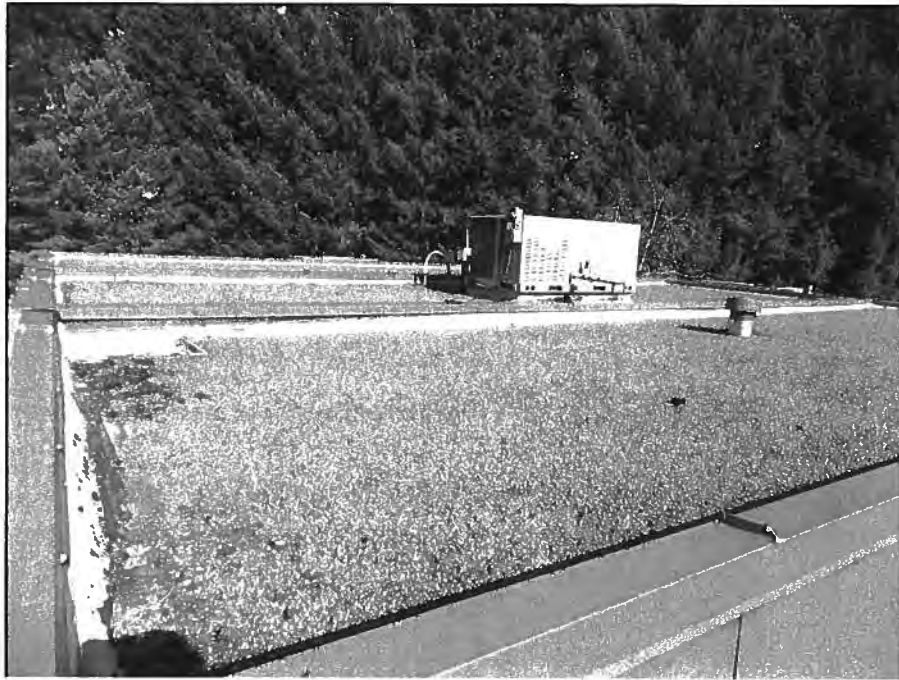
**EHE. 1.03 – View of repair at current interior leakage area at northeast section of the roof.**



**EHE. 1.04 – View of void in the cap of penetration flashing at northeast section of roof.**



**EHE. 1.05 – View of typical roof drain scupper with splits and coating deterioration.**

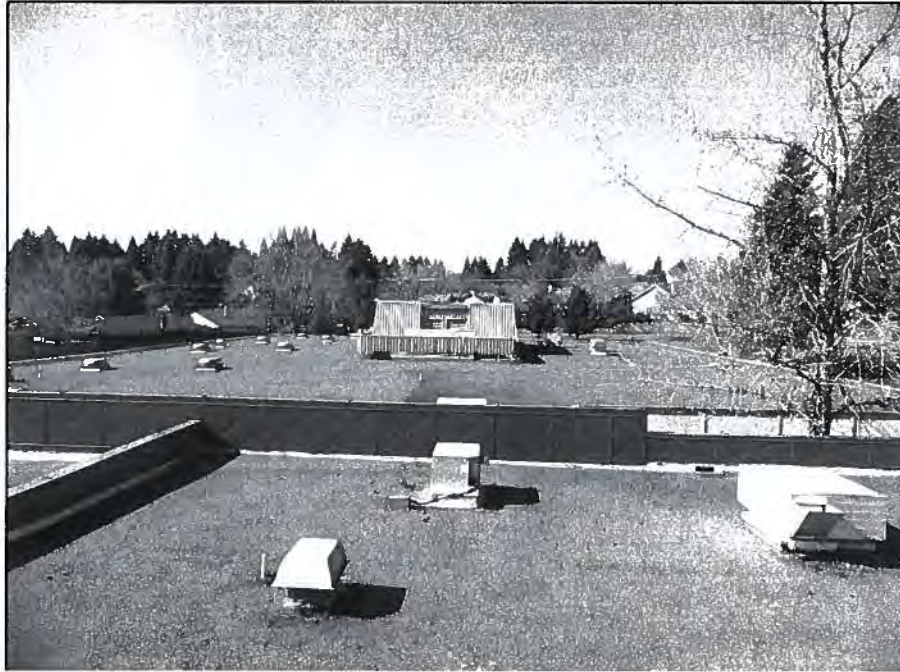


**EHE. 1.06 – View to northwest of the upper roof areas.**

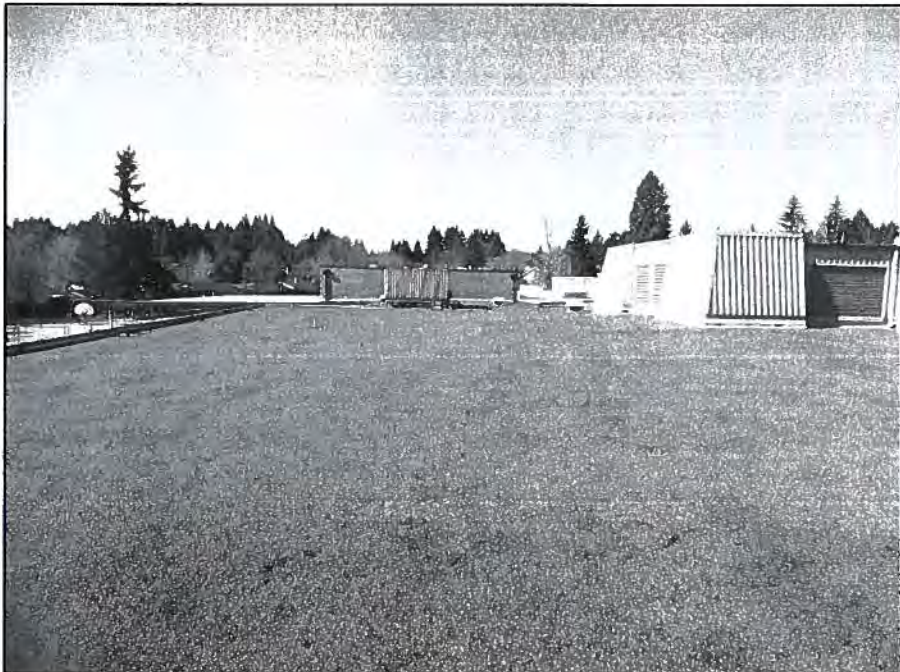


**HE. 1.01 – View to west of the front elevation of Hiteon Elementary school.**





**HE. 1.02 – View to west at the west section of the roof.**



**HE. 1.03 – View to the west of the southeast section of roof.**



**HE. 1.04 – View of typical roof drain and overflow drain at the east section of the roof.**



**HE. 1.05 – View of typical roof drain and overflow scupper at the northwest section of the roof.**





**HE. 1.06 – View to the west of coated roof system at the covered playground section of roof.**



**ME. 1.01 – View to south of front elevation of Montclair Elementary school.**



**ME. 1.02 – View to east at southwest section of the roof with ponding water and moss build-up.**

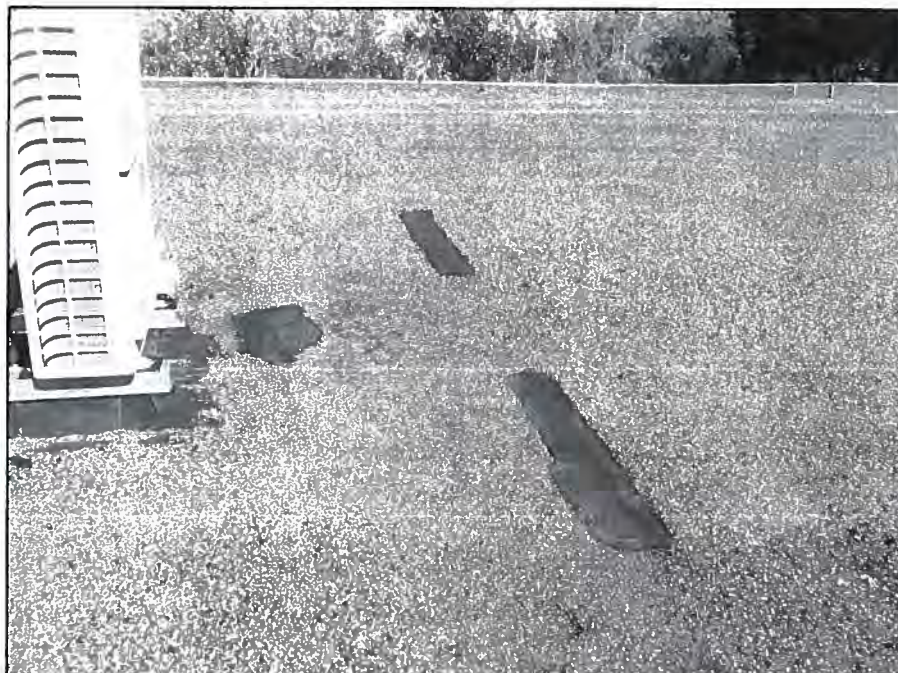


**ME. 1.03 – View of typical roof drain and overflow drain with evidence ponding water and moss build-up at the east section of the roof.**



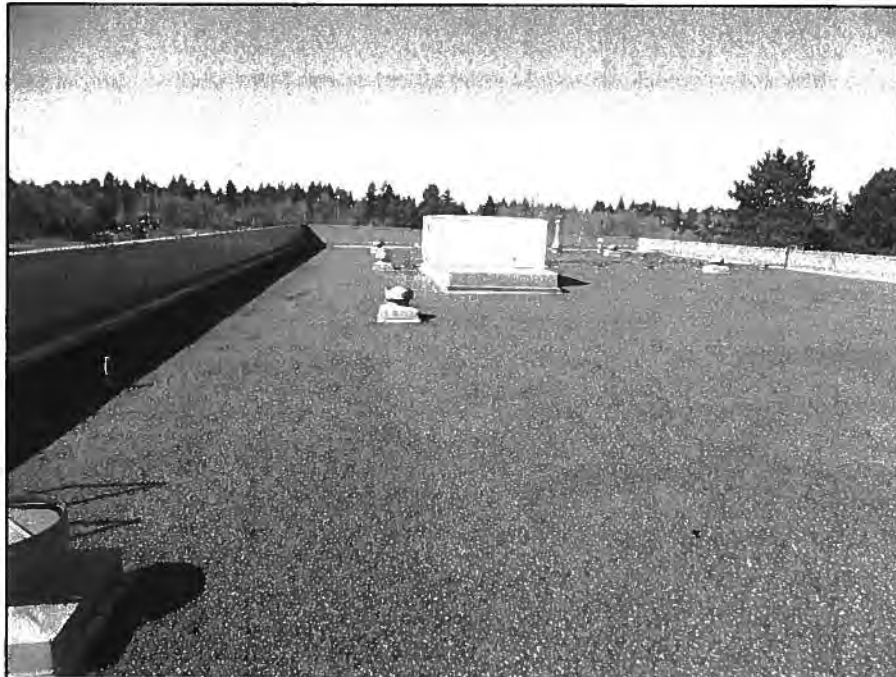


**ME. 1.04 – View to the east at the north section of the roof.**

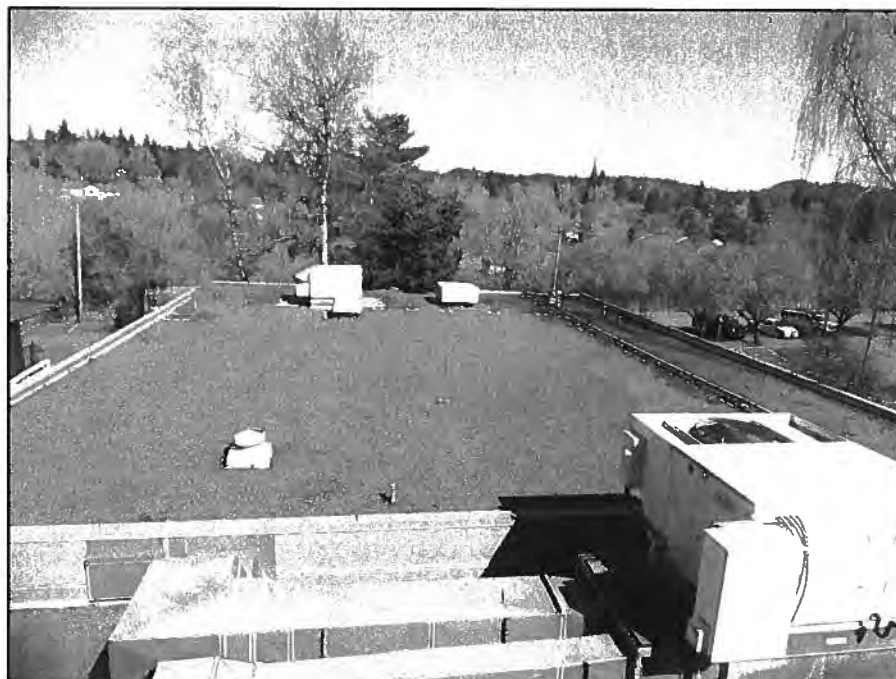


**ME. 1.05 – View of typical repairs at the east section of the roof.**





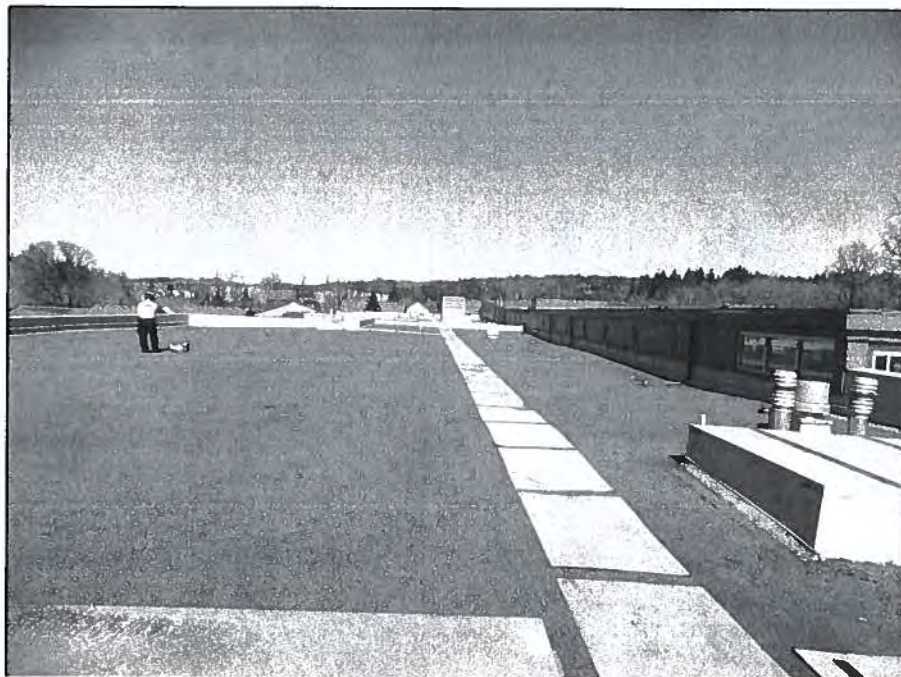
**ME. 1.06 – View to west with ponding water and moss build-up along south section of roof.**



**ME. 1.07 – View to the north of northwest roof with evidence of moss build-up.**



**JWE. 1.01– View to north of the front elevation of Jacob Wismer Elementary school.**



**JWE. 1.02– View to north of the southwest section of roof.**

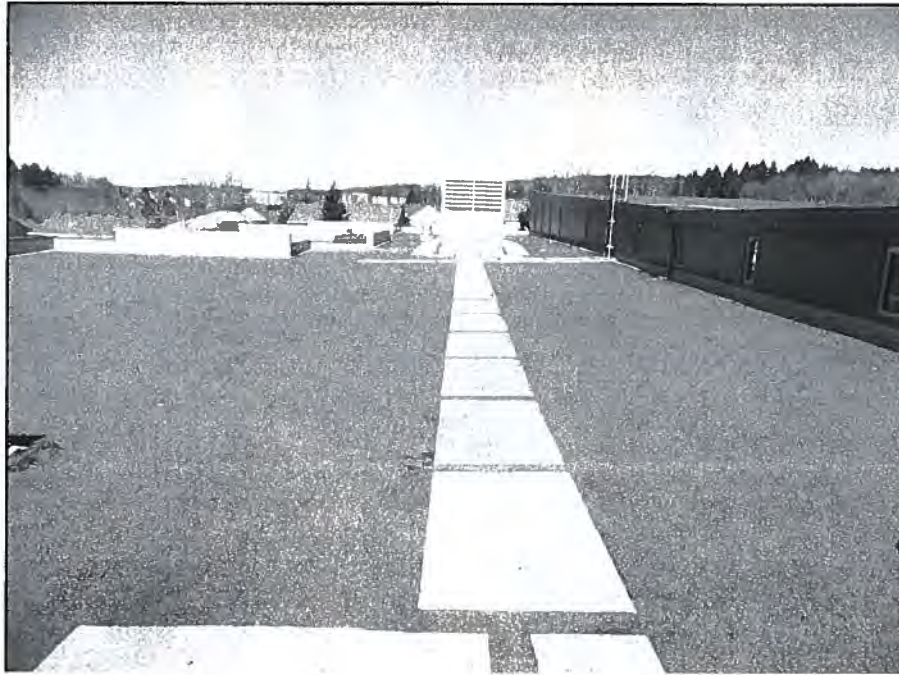


**JWE. 1.03– View of typical wall metal and coping flashing at the southwest section of roof, area has had previous leaks.**



**JWE. 1.04– View of typical roof drain and overflow drain at the west section of the roof.**





**JWE. 1.05– View to the north at the northwest section of roof.**



**JWE. 1.06 – View of fiberglass exposed in membrane at large roof top unit at the northwest section of the roof.**



**JWE. 1.07– View of moss and organic debris on roof at the southeast section of roof area.**

**- End of Photo Section -**

17347 37-25-17 Central SD Central High School V05 18 Photo

SW Lisa Ct

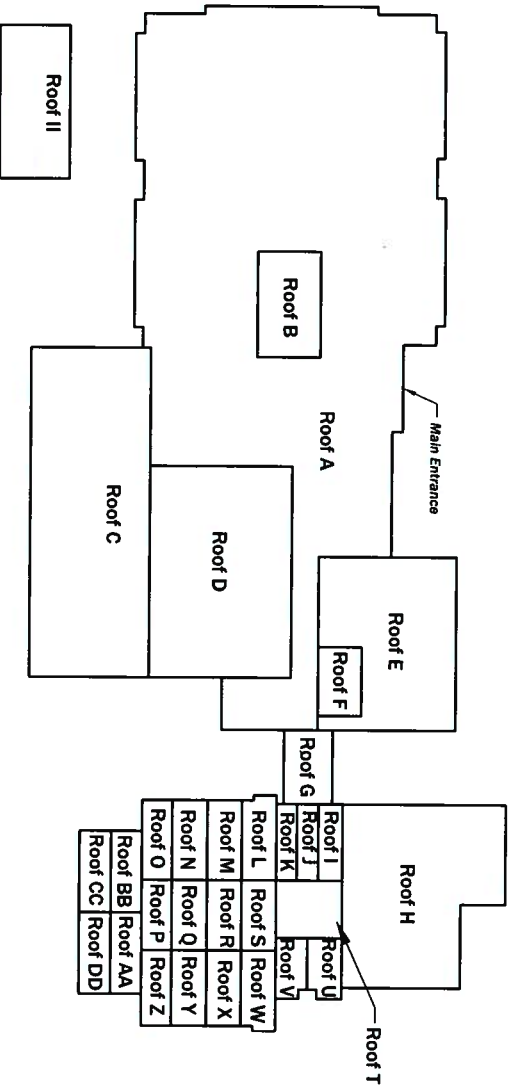
Roof KK

Roof JJ

Parking

Parking

SW 170th Ave



Single-ply

ROOF AREA SQ.FT.  
(Approximate)

|         |           |
|---------|-----------|
| Roof A: | 26,654 sf |
| Roof B: | 7,470 sf  |
| Roof C: | 5,550 sf  |
| Roof D: | 3,891 sf  |
| Roof E: | 559 sf    |
| Roof F: | 673 sf    |
| Roof G: | 4,884 sf  |
| Roof H: | 49,681 sf |
| Total:  | 49,681 sf |

Gravel

ROOF AREA SQ.FT.  
(Approximate)

|          |           |
|----------|-----------|
| Roof B:  | 1,251 sf  |
| Roof I:  | 346 sf    |
| Roof J:  | 298 sf    |
| Roof K:  | 298 sf    |
| Roof L:  | 550 sf    |
| Roof M:  | 509 sf    |
| Roof N:  | 509 sf    |
| Roof O:  | 509 sf    |
| Roof P:  | 448 sf    |
| Roof Q:  | 396 sf    |
| Roof R:  | 450 sf    |
| Roof S:  | 450 sf    |
| Roof T:  | 713 sf    |
| Roof U:  | 374 sf    |
| Roof V:  | 340 sf    |
| Roof W:  | 499 sf    |
| Roof X:  | 478 sf    |
| Roof Y:  | 478 sf    |
| Roof Z:  | 421 sf    |
| Roof AA: | 477 sf    |
| Roof BB: | 477 sf    |
| Roof CC: | 495 sf    |
| Roof DD: | 495 sf    |
| Total:   | 10,828 sf |

Comp Shingle

ROOF AREA SQ.FT.  
(Approximate)

|          |           |
|----------|-----------|
| Roof EE: | 2,076 sf  |
| Roof FF: | 2,110 sf  |
| Roof GG: | 1,979 sf  |
| Roof HH: | 1,934 sf  |
| Roof II: | 2,074 sf  |
| Roof JJ: | 1,034 sf  |
| Roof KK: | 1,026 sf  |
| Total:   | 12,233 sf |

Roof Total: 72,742 sf

Elmonica Elementary School  
16950 SW Lisa Ct  
Beaverton, OR

BEAVERTON SCHOOL DISTRICT  
Elmonica Elementary School - Beaverton, OR

SCALE: NTS  
DATE: 3/30/2020  
DRAWN BY: DVG  
REVISED:  
PROJECT NUMBER: 20054  
As-Built Drawing

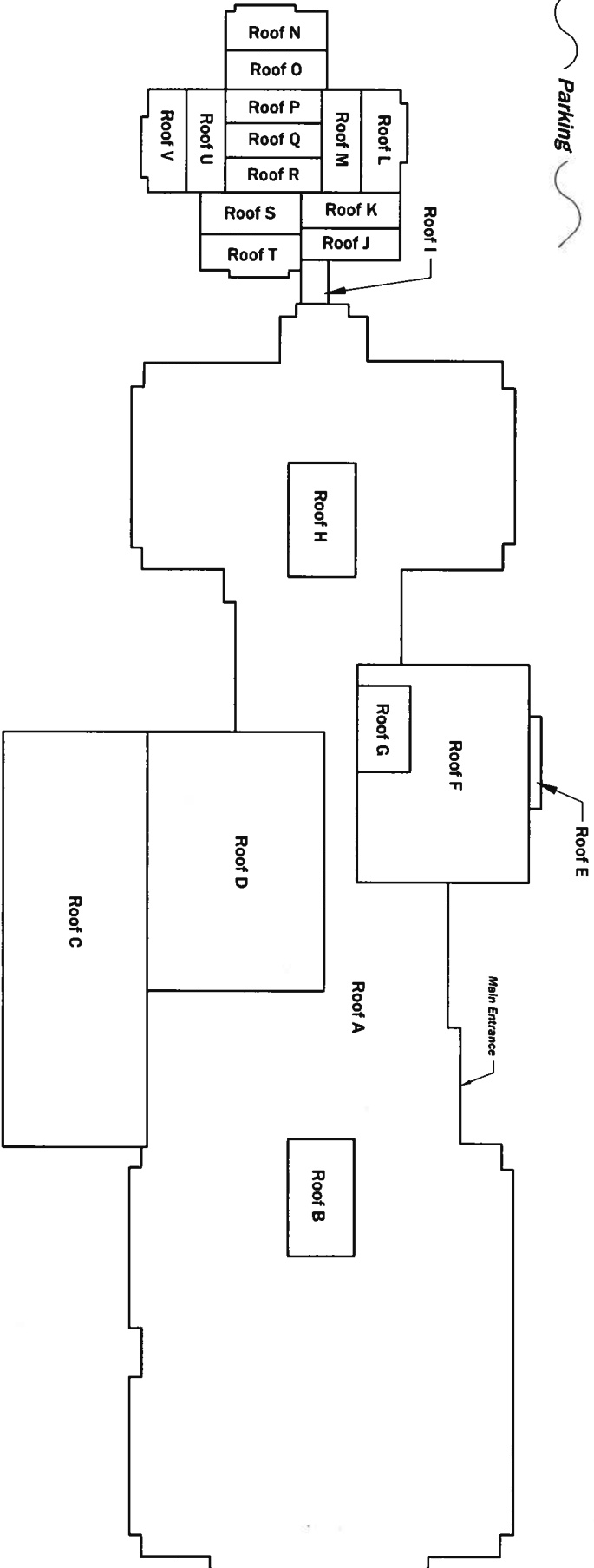
A-TECH/NORTHWEST, INC.  
Portland & Pineville, Oregon 503-628-2882

SW Bany Rd

Parking

Parking

Play ground



Gravel  
ROOF AREA SQ.FT.  
( Approximate )

Single-ply  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof A: | 37,808 sf |
| Roof B: | 932 sf    |
| Roof C: | 7,178 sf  |
| Roof D: | 5,462 sf  |
| Roof E: | 133 sf    |
| Roof F: | 3,919 sf  |
| Roof G: | 537 sf    |
| Roof H: | 924 sf    |
| Total:  | 56,893 sf |

|         |          |
|---------|----------|
| Roof I: | 147 sf   |
| Roof J: | 375 sf   |
| Roof K: | 422 sf   |
| Roof L: | 527 sf   |
| Roof M: | 487 sf   |
| Roof N: | 519 sf   |
| Roof O: | 475 sf   |
| Roof P: | 391 sf   |
| Roof Q: | 400 sf   |
| Roof R: | 400 sf   |
| Roof S: | 505 sf   |
| Roof T: | 484 sf   |
| Roof U: | 473 sf   |
| Roof V: | 522 sf   |
| Total:  | 6,124 sf |

Errol Hassell Elementary School  
18100 SW Bany Rd  
Beaverton, OR

Roof Total:

63,017 sf



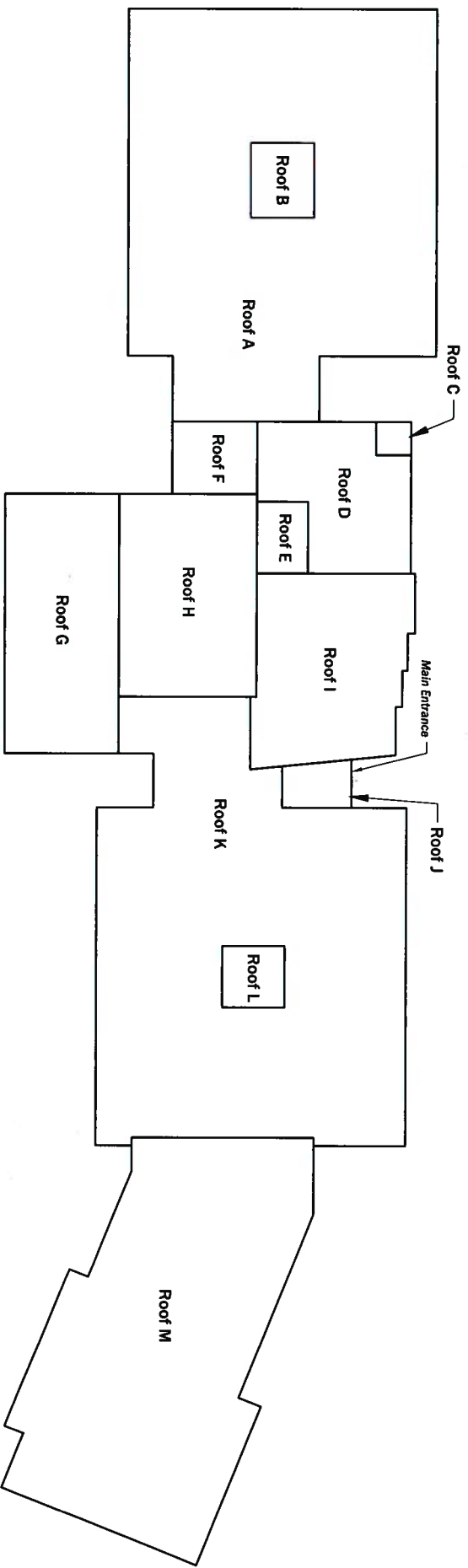
**BEAVERTON SCHOOL DISTRICT**  
**Errol Hassell Elementary School - Beaverton, OR**

SCALE: NTS  
DATE: 3/20/2020  
1 OF 1  
A-TECH / NORTHWEST, INC.  
Portland & Pineville, Oregon 503 - 628 - 2892  
As-Built Drawing  
PROJECT NUMBER: 20054



SW Davies Rd

SW Brockman Rd



Playground

Parking

Gravel  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof A: | 22,200 sf |
| Roof B: | 936 sf    |
| Roof C: | 233 sf    |
| Roof D: | 3,709 sf  |
| Roof E: | 722 sf    |
| Roof F: | 1,223 sf  |
| Roof H: | 5,533 sf  |
| Roof K: | 22,537 sf |
| Roof L: | 746 sf    |
| Total:  | 57,839 sf |

Single-ply  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof G: | 5,747 sf  |
| Roof I: | 5,690 sf  |
| Roof J: | 627 sf    |
| Roof M: | 16,412 sf |
| Roof N: | 1,330 sf  |
| Total:  | 29,806 sf |

Roof Total:

87,645 sf

Hiteon Elementary school  
13800 SW Brockman Rd  
Beaverton, OR



BEAVERTON SCHOOL DISTRICT

Hiteon Elementary school - Beaverton, OR

SCALE: NTS

DATE: 3/30/2020

A-TECH/NORTHWEST, INC.

Portland & Prineville, Oregon 503-628-2882

As-Built Drawing

PROJECT NUMBER: 20054

1 of 1

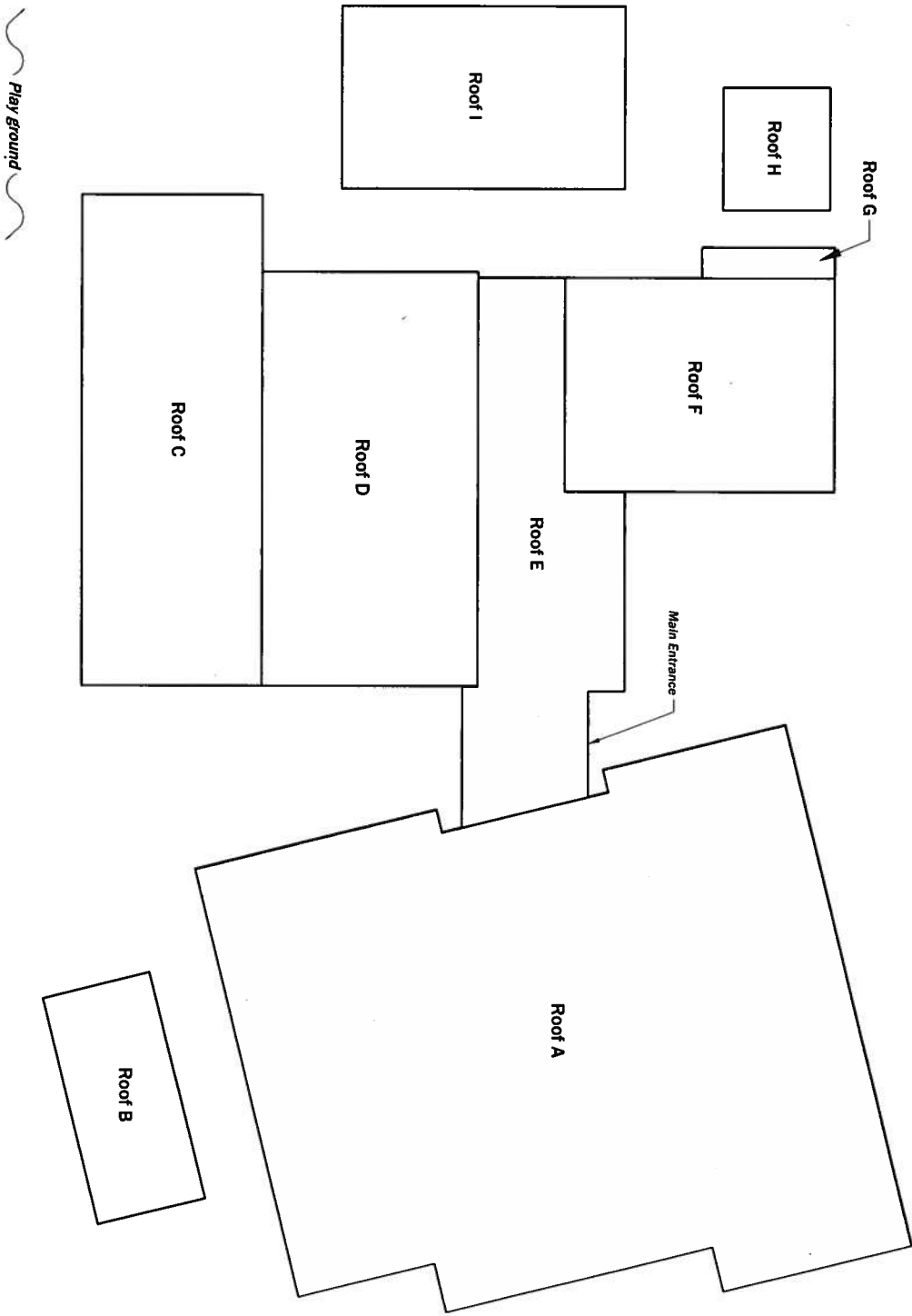
DRAWN BY: D.Y.A.

REVISED



SW Vermont St →

Parking



Montclair Elementary School  
7250 SW Vermont St  
Portland, OR

|                  |           |
|------------------|-----------|
| Gravel           |           |
| ROOF AREA SQ.FT. |           |
| (Approximate)    |           |
| Roof A:          | 23,323 sf |
| Roof B:          | 1,989 sf  |
| Roof C:          | 6,988 sf  |
| Roof D:          | 7,034 sf  |
| Roof E:          | 4,971 sf  |
| Roof F:          | 4,542 sf  |
| Roof G:          | 323 sf    |
| Roof H:          | 1,013 sf  |
| Total:           | 50,183 sf |
| Single-ply       |           |
| ROOF AREA SQ.FT. |           |
| (Approximate)    |           |
| Roof I:          | 4,028 sf  |
| Roof Total:      | 54,211 sf |

BEAVERTON SCHOOL DISTRICT

Montclair Elementary School - Portland, OR

DATE 3/30/2020

SCALE NTS

1 of 1

DRAWN BY D.L.G.

REVIEWED

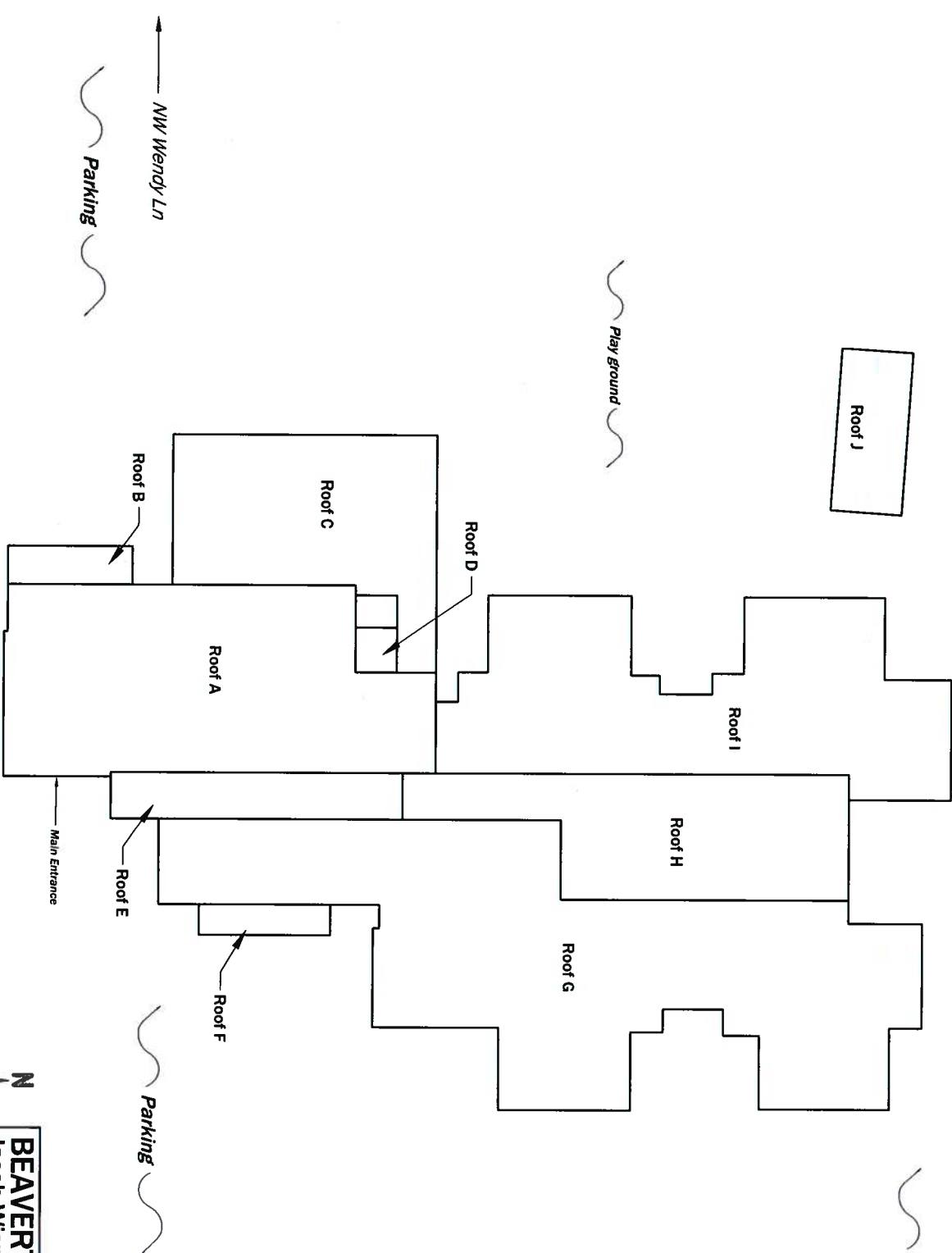
A-TECH/NORTHWEST, INC.

Portland & Prineville, Oregon 503-628-2882

PROJECT NUMBER 20054

As-Built Drawing

Jacob Wismer Elementary School  
5477 NW Skycrest Pkwy  
Portland, OR



Gravel  
ROOF AREA SQ.FT.  
( Approximate )

|         |           |
|---------|-----------|
| Roof A: | 11,574 sf |
| Roof B: | 731 sf    |
| Roof C: | 6,779 sf  |
| Roof D: | 291 sf    |
| Roof E: | 2,111 sf  |
| Roof F: | 622 sf    |
| Roof G: | 19,154 sf |
| Roof H: | 6,804 sf  |
| Roof I: | 11,582 sf |
| Total:  | 59,648 sf |

Comp Shingle  
ROOF AREA SQ.FT.  
( Approximate )

|             |           |
|-------------|-----------|
| Roof J:     | 1,794 sf  |
| Roof Total: | 61,442 sf |

BEAVERTON SCHOOL DISTRICT  
Jacob Wismer Elementary School - Portland, OR

|  |        |                  |
|--|--------|------------------|
| SCALE: NS                                  | 1 of 1 | DRAWN BY: D.J.G. |
| DATE: 3/30/2020                            |        | REVISED:         |
| A-TECH/NORTHWEST, INC.                     |        |                  |
| Portland & Prineville, Oregon 503-628-2882 |        |                  |
| As-Built Drawing                           |        |                  |
| PROJECT NUMBER: 20054                      |        |                  |



To CIDA  
15895 SW 72<sup>nd</sup> Ave  
Portland, OR 97224

Submitted  
October 14th, 2020  
RDH Building Science Inc.  
5331 S Macadam Avenue #314  
Portland OR 97239

# Contents

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**Appendix A – Photos of Roof Conditions**

**Appendix B - Roof Plan - Impedance Scanning and Cores**

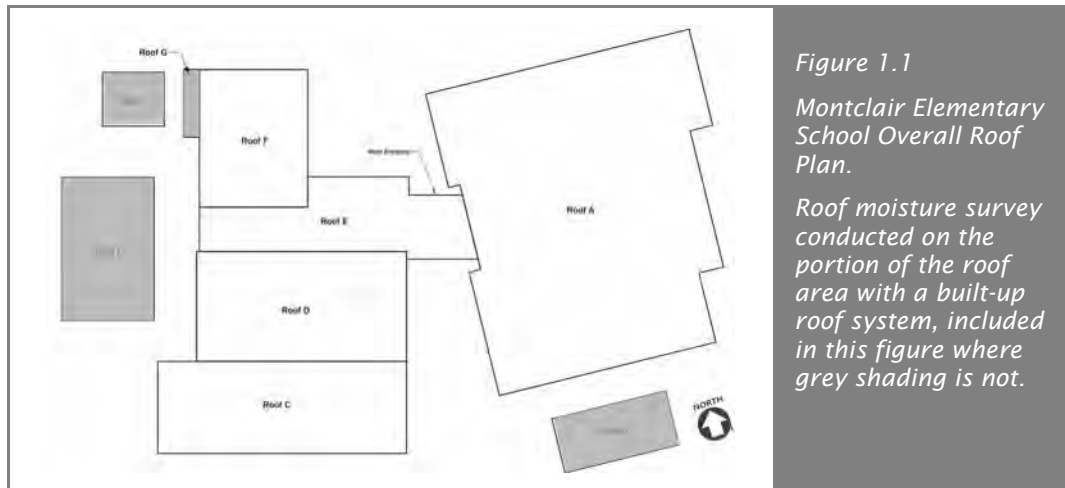
**Appendix C – Roof – IR Scan Results**

**Appendix D – Photos – Roof Cores**

# 1 Project Background

RDH Building Science Inc. (RDH) was retained by CIDA on behalf of the Beaverton School District (BSD) to perform a roof moisture survey on built-up roof systems at four (4) school campuses that are included in the BSD portfolio. BSD is planning re-roofing efforts for the 2021 summer season. The purpose of the work described in this report is a) to provide verification that existing built-up systems are acceptable for re-cover applications and that manufacturers' warranties can be provided, and b) that there are no hidden or unforeseen conditions associated with the existing built-up roof system. This report documents our findings at Montclair Elementary School, located at 7250 SW Vermont Street, Portland OR 97223. Refer to Figure 1.1 for the extent of roof area surveyed.

This report documents data collection and observations from the roof moisture survey. This report has been undertaken for CIDA on behalf of BSD and is not to be relied on by others.



## 2 Data Collection

### 2.1 Document Review

The documents provided to and reviewed by RDH are listed in Table 2.1.

| TABLE 2.1 DOCUMENTS REVIEWED  |   |
|---|---|
| DOCUMENT DESCRIPTION  | DOCUMENT PAGES                            |
| Document Type: Architectural Drawings<br>Title: BSD Montclair Elementary School: 2021 Re-Roof<br>Author: CIDA<br>Issuance: 08/05/2020 | CS1, AD0.1, AD1.1, A1.1, A2.1, A3.1, S1.1 |
| Document Type: Report<br>Title: Roof Inspection Report<br>Author: A-Tech/Northwest, Inc.<br>Dated: 03/06/2020                         | 1-26                                      |

We note the following relevant information that is related from review of the documents provided:

- The A-Tech/Northwest report indicates that current interior water leakage is reported in several areas.

## 2.2 Historic Information

A history of activities and events including past leakage and repairs relating to the existing roof assembly as reported to us or described in reviewed documents are listed in Table 2.2.

| TABLE 2.2 HISTORIC EVENTS RELATING TO EXISTING ROOF PERFORMANCE |  |
|---|--|
| DATE  | EVENT  |
| 1970  | Approximate date of construction                                 |
| 2009  | Tremco built-up roof system installation (Per A-Tech/NW report)  |
| March 16, 2020  | Current leakage reported at several areas (Per A-Tech/NW report) |

## 2.3 Field Work

Relevant information pertaining to the field work performed during the roof moisture survey are included in Table 2.3.

| TABLE 2.3 DETAILS OF FIELD WORK                  |  |
|--|--|
| Dates of Roof Assessment: 2020/09/21, 2020/09/22 |  |
| Impedance Testing                                | Yes  |
| Infrared Scanning                                | Yes  |
| Test Cuts  | Yes  |
| Method of Roof Access                            | Access Door & Ladder                             |
| RDH Staff in Attendance                          | Cameron Chorney<br>Shinji Coram<br>Scott Mecalis |
| Other Parties in Attendance                      | Juan Cardoso - Carlson Roofing                   |

## 2.4 Existing Roof System

General information and specific components of the existing roof system, as identified by core sampling are listed in Table 2.4.

| TABLE 2.4 EXISTING ROOF SYSTEM |                                      |
|--------------------------------|--------------------------------------|
| Roof Age                       | Approximately 11 years               |
| General Roof Assembly          |                                      |
| Deck Type                      | Plywood                              |
| Vapor Barrier                  | None observed                        |
| Insulation                     | 2" Paper-faced polyisocyanurate      |
| Cover Board                    | ½" Fiberboard                        |
| Roof Membrane                  | Hot-mopped asphalt built-up roofing  |
| Ballast                        | Pea Gravel                           |
| Protection Course              | N/A                                  |
| Means of Drainage              | Internal Drain with Overflow Scupper |
| Approximate Roof Area          | 50,183 Sq. Ft.                       |
| Warranty Available (Y/N)       | No                                   |

## 3 Observations and Field Testing

### 3.1 Visual Observations

We made the following visual observations during our time on site. Refer to Appendix A for photographic examples of the conditions listed below.

- Embedded flashings at the roof perimeter and near penetrations, drains, and curbs contain metal that resulted in inconsistent impedance readings in these areas and are not included in our results.
- Electrical conduits and light fixtures at the underside of the south canopy roof interfered with impedance readings and are not included in our results.
- Due to a large amount of moss buildup, we did not review Roof G at the NW building corner.
- Moisture is trapped between some roof walk pads, which is expected as walk pads are typically partially adhered, and the roof membrane and are not included in our results.
- Standing water and moss buildup is present along the south and west edges of the east wing roof. Impedance readings were not taken at these areas.
- In general, the roof membrane is in fair condition. A large patch was present near the rooftop units at the east wing roof. This patch did not interfere with impedance readings.
- The high roof is drained by internal drains located in the south corners of the roof, with overflow scuppers. The NW wing roof similarly is drained internally, with overflow scuppers. The center roof and east wing roof are drained though internal drains and overflow drains. The south canopy roof is sloped to a gutter on the south edge and has a total of five downspouts.

- Air filled bubbles and blisters are present in the roof membrane at many locations, which are indicated on the impedance scanning roof plan in Appendix B.
- Perimeter parapets are detailed with membrane flashing, metallic paint, and standing seam metal coping. Metallic paint is peeling in several locations.

## 3.2 Impedance Scanning

RDH performed impedance testing in general accordance with ASTM D7954-15a. Refer to Table 2.3 for general information related to field work. Refer to Table 3.1 for information specifically pertaining to impedance testing.

| TABLE 3.1 IMPEDANCE TESTING DETAILS                               |  |
|---|--|
| Date of Impedance Testing   | 2020/09/21   |
| Time of Impedance Testing   | 0820h to 1300h   |
| Ambient Temperature, Relative Humidity, and Dew Point Temperature |  |
| Pre-Testing   | 59 °F, 87 %RH, 55 °F   |
| Mid-Testing   | 63 °F, 56 %RH, 78 °F   |
| Post-Testing  | 67 °F, 68 %RH, 56 °F   |
| Date and Amount of Last Precipitation Event                       | 0.29 inches on 2020/09/18                                    |
| Impedance Scanner Operator and Data Analyst                       | Cameron Chorney  |
| Scanner Make, Model and Serial Number                             | Tramex DEC DSAL rolling scanner (Serial Number: DS2 0720292) |

Testing was conducted using Technique A, Continuous Systematic Scanning and Recording, by rolling the DSAL on the roof membrane in a systematic and continuous row-by-row manner when traversing the roof surface. This results in scanning approximately 100% of the roof survey area.

Impedance testing indicated that one area of insulation and fiberboard below the roof membrane were measured to have elevated electrical conductivity in comparison to adjacent roof areas. Elevated conductivity is an indication of elevated moisture below the membrane.

Refer to Appendix B for a roof plan that shows color coded locations and relative sizes of areas with elevated EMC readings as determined during impedance testing. All elevated EMC readings are color coded red as all readings were above 100% on the scanner's meter. Appendix B also shows the locations of openings and scanner calibration.

## 3.3 Infrared Scanning

We performed ground based infrared scanning in general accordance with ASTM C1153-10(r15). Refer to Table 2.3 for general information related to field work. Refer to Table 3.2 for specific information pertaining to infrared scanning.



| TABLE 3.2 INFRARED SCANNING DETAILS   |                                  |
|---|----------------------------------|
| Date of Infrared Scanning   | 2020/09/21                       |
| Time of Infrared Scanning   | 0829h to 0915h                   |
| Ambient Temperature, Wind Velocity and Cloud Cover at Time of Infrared Scanning |                                  |
| 59 °F, 3 mph, Moderate Cloud Coverage   |                                  |
| Precipitation and Cloud Cover In 24 Hours Prior to Infrared Scanning            |                                  |
| 0 inches, Moderate Cloud Coverage   |                                  |
| Infrared Camera Make and Model  | Fluke Ti401 PRO handheld camera  |
| Camera Lens   | Fluke Wide Angle Smart Lens      |
| Camera Spectral Range   | 7.5 µm to 14 µm (micro-meter)    |
| Camera Operator and Data Analyst  | Cameron Chorney and Shinji Coram |

Infrared scanning was performed by making passes approximately 10-15 feet wide. Due to weather conditions at the time of review, we only reviewed the high roof at the gymnasium (Roof D), equating to approximately 15% of the roof area. For scans taken during the day at a ballasted roof such as found at Montclair, the test standard requires the exterior temperature to be 32°F (18°C) cooler than the interior. This was achieved at the gymnasium due to the high ceiling, but was not possible at the rest of the building, where interior temperature (72°F) was only 13 degrees warmer than the exterior air (59°F). Scans taken at the other roof areas were not able to confirm or deny the existence of air or moisture trapped in the roof assembly.

Infrared scanning indicated that multiple areas of the high roof were measured to have elevated temperatures in comparison to adjacent roof areas. These areas typically corresponded with an air bubble or blister in the membrane, indicating trapped subsurface air. As the areas of elevated temperature were less than 1 degree warmer than the surrounding area, they do not conclusively indicate subsurface air or moisture as the heating and cooling effects of the sun and wind play a larger factor when scans are taken during the day.

Refer to Appendix C for the IR images taken during infrared scanning.

## 4 Roof Openings

Both ASTM D7954-15a and C1153-10(r15) require that test openings be made into the roof assembly. These openings provide verification results to quantify the actual moisture content found between membrane layers and within insulation.

With the assistance of Carlson roofing, we conducted three roof core samples total, two at areas indicated by the structural engineer, and one suspected area of moisture as indicated by impedance scans. Core sample specimens of insulation, fiberboard, and membrane having a minimum of 2-in. diameter were obtained by cutting through these components down to the plywood deck and removing them from the roofing section under test. The third core sample specimen showed signs of moisture present within the roof assembly. We observed the plywood roof deck sheathing to be good condition in all core samples.

Refer to Appendix C for photographic documentation from roof test openings described above and Appendix B for locations and the moisture findings that are combined with the Impedance scan results.

## 5 Summary of Testing

Impedance testing and infrared scanning confirm that one area of the roof is measured to have elevated subsurface moisture. This testing verifies the need to prioritize re-roofing within the next 1-2 years. Our testing, document review and visual observations confirm the roof is generally in fair condition. We recommend planning for re-roofing in approximately 1-2 years.

We understand that BSD and CIDA are planning to re-roof at Montclair in 2021 and the scope of work consists of a full removal of the existing system, and replacement with a new single-ply EPDM roof system. The areas with subsurface moisture indicate areas where additional attention and repair work will be required. If left unaddressed, the trapped moisture may void the manufacturer's warranty of the new system.

## 6 Closure

We appreciate the opportunity to work with CIDA and BSD. Please do not hesitate to contact the writer with any questions or to discuss next steps.

Yours truly,



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encl.

Appendix A – Photos of Roof Conditions

Appendix B - Roof Plan - Impedance Scanning and Cores

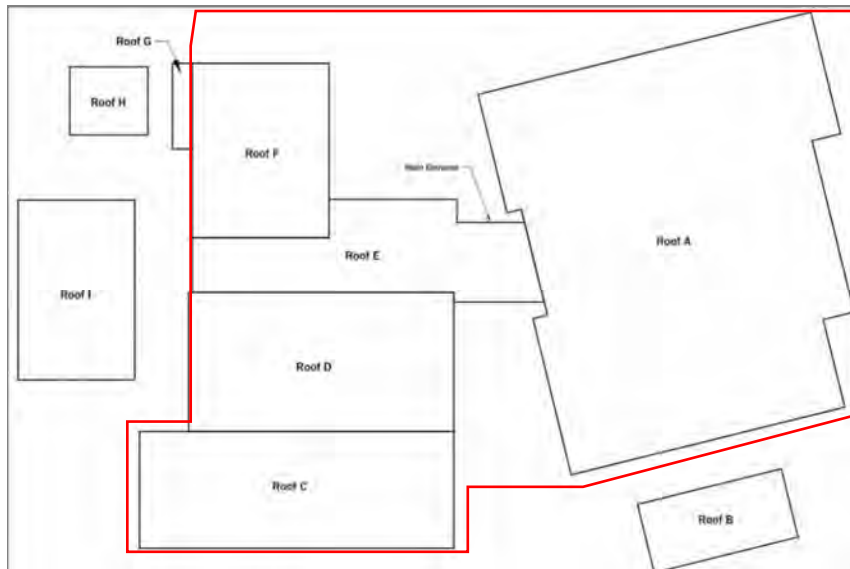
Appendix C – Roof – IR Scan Results

Appendix D – Photos – Roof Cores

# Appendix A

## Photos of Roof Conditions

## Appendix A – Photos of Roof Conditions



*Figure A.1*

*Overall roof plan with area of moisture survey identified in red.*



*Figure A.2*

*View of Roof E, looking west.*



*Figure A.3*  
*View of Roof A, looking east*  
*from Roof E.*



*Figure A.4*  
*View of Roof D, looking west.*



*Figure A.5*  
*View of Roof F, looking north.*



*Figure A.6*  
*View of Roof C, looking west.*





*Figure A.7*

*Roof G as viewed from Roof E, not included in review due to access issues and moss coverage.*



*Figure A.8*

*Typical drain and overflow drain at Roof A.*



*Figure A.9*  
*Typical drain and scupper at*  
*Roof D.*



*Figure A.10*  
*Electrical conduit and light*  
*fixtures at underside of*  
*canopy Roof C.*





*Figure A.11*  
*Standing water along south*  
*perimeter at Roof A.*









*Figure A.12*  
*Example of blister/air bubble*  
*(circled) at Roof D*

# Appendix B

## Roof Plan - Impedance Scanning and Cores



### Legend

|   |                                   |
|---|-----------------------------------|
|  | Calibration Point                 |
|  | Moisture Detected - ID # & Extent |
|  | Air Bubble/Blister                |
|  | Ponding Water                     |
|  | Core Location                     |
|  | No Review                         |



# Appendix C

## Roof - IR Scan Results

## Appendix C – IR Scan Results

Infrared (IR) scanning was conducted in general accordance with ASTM C1153-10(r15). Due to scheduling and weather constraints, measurements were not able to be taken at night as recommended by the test standard.

Scanning was performed by making passes approximately 10-15 feet wide. Due to weather conditions at the time of review, we only reviewed the high roof at the gymnasium (Roof D), equating to approximately 15% of the roof area. For scans taken during the day at a ballasted roof such as found at Montclair, the test standard requires the exterior temperature to be 32°F (18°C) cooler than the interior. This was achieved at the gymnasium due to the high ceiling, but was not possible at the rest of the building, where interior temperature (72°F) was only 13 degrees warmer than the exterior air (59°F). Scans taken at the other roof areas were not able to confirm or deny the existence of air or moisture trapped in the roof assembly.

Infrared scanning indicated that multiple areas of the high roof were measured to have elevated temperatures in comparison to adjacent roof areas. These areas typically corresponded with an air bubble or blister in the membrane, indicating trapped subsurface air. At other roof areas, areas of elevated temperature were less than 1 degree warmer than the surrounding roof area, and do not necessarily indicate subsurface air or moisture, as the heating and cooling effects of the sun and wind play a larger factor when scans are taken during the day.

| TABLE C.1 IMAGER SETTINGS |                               |
|---------------------------|-------------------------------|
| Interior Temperature      | 72 °F                         |
| Exterior Temperature      | 59F                           |
| Wind speed                | 3 mph                         |
| Cloud Cover               | Moderate                      |
|                           |                               |
| Make/Model                | Fluke Ti401 PRO               |
| Lens                      | Fluke Wide Angle Smart Lens   |
| Emissivity                | 0.95                          |
| Background Temperature    | 71.60 °F                      |
| Spectral Range            | 7.5 µm to 14 µm (micro-meter) |
| Calibration Range         | -4.00 °F to 212.00 °F         |
| IR Sensor Size            | 640x480                       |
| Camera Operator           | Shinji Coram                  |



TABLE C.2 GYMNASIUM ROOF

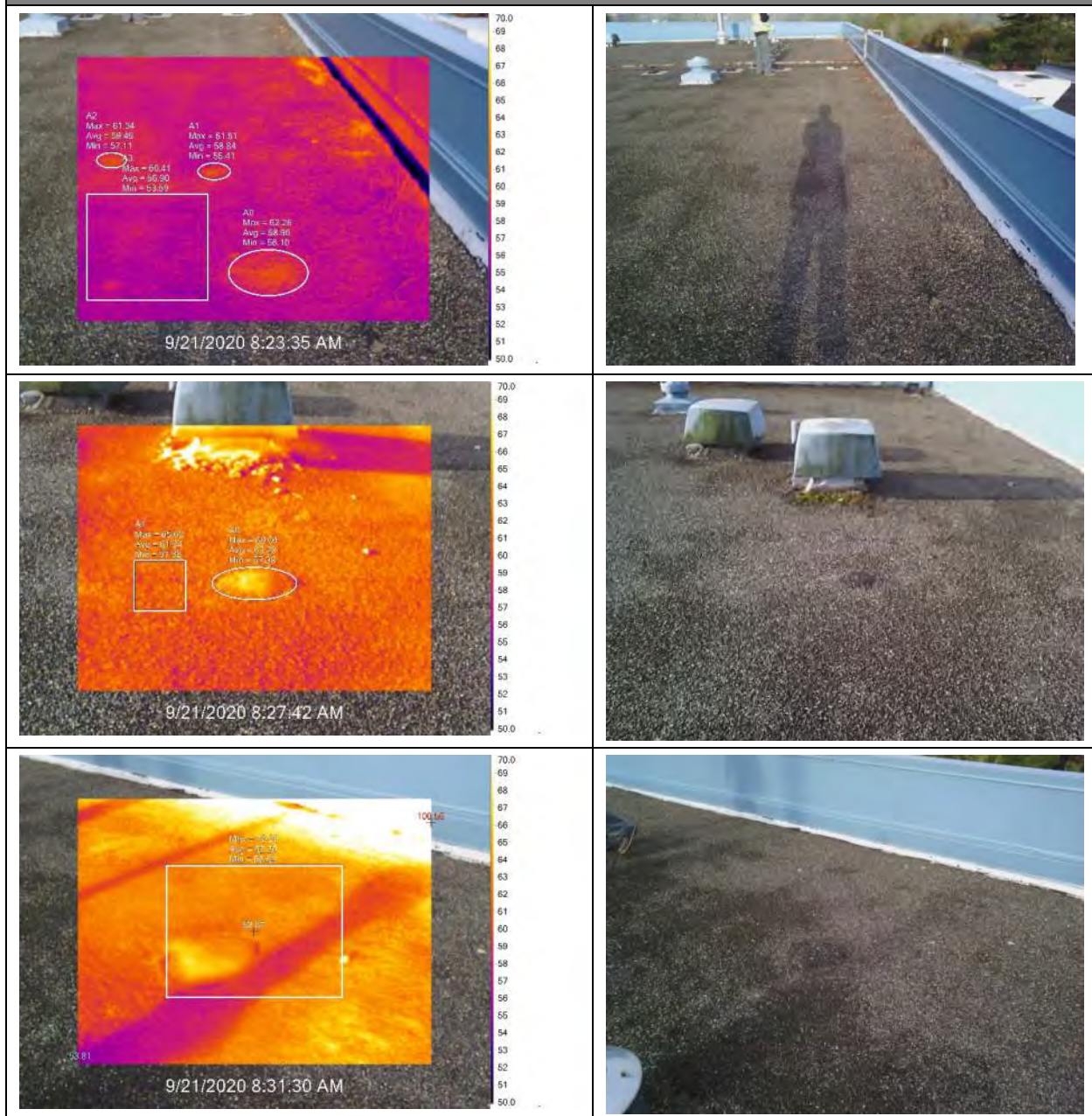


TABLE C.2 GYMNASIUM ROOF

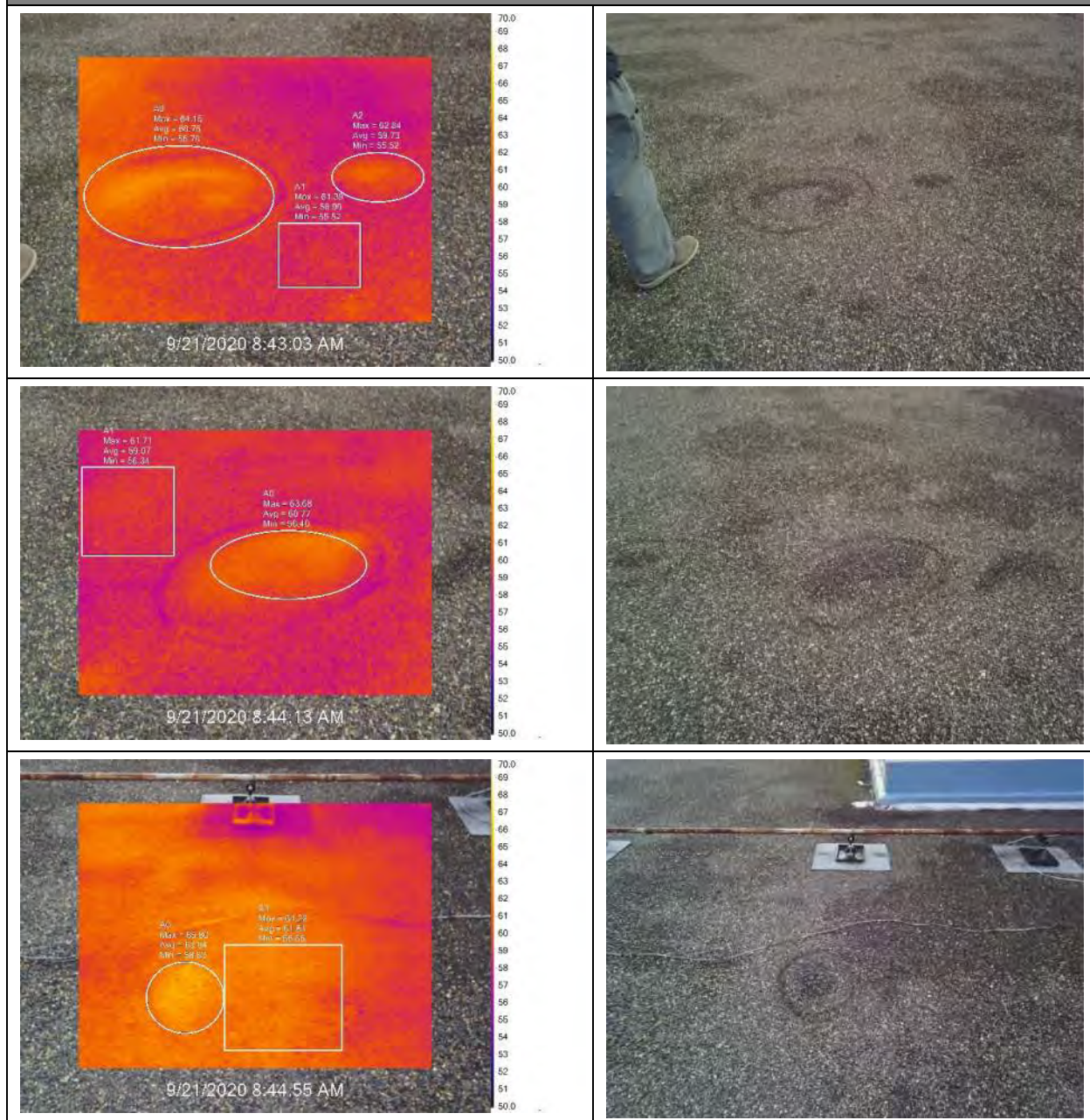




TABLE C.2 GYMNASIUM ROOF

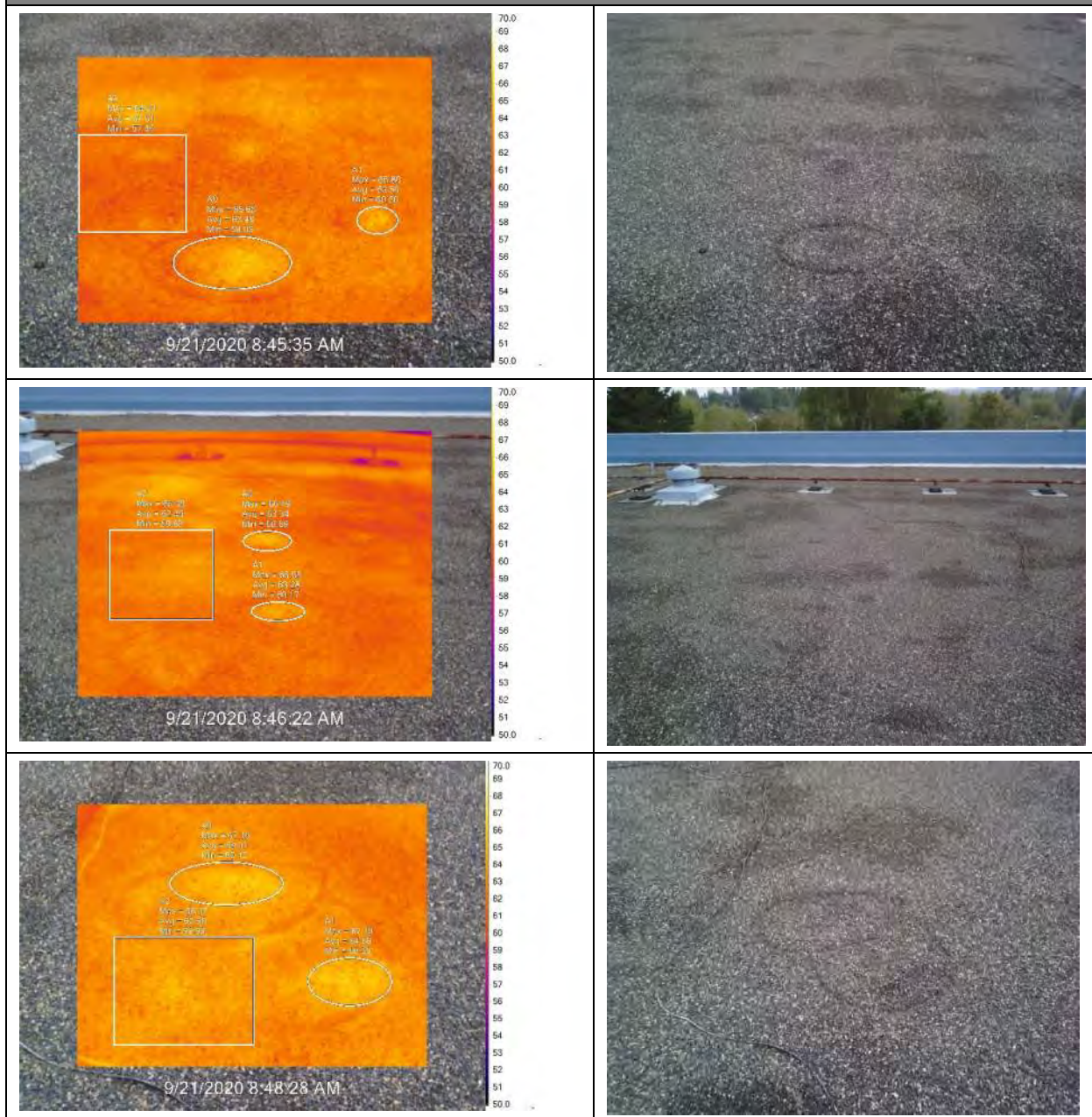




TABLE C.2 GYMNASIUM ROOF

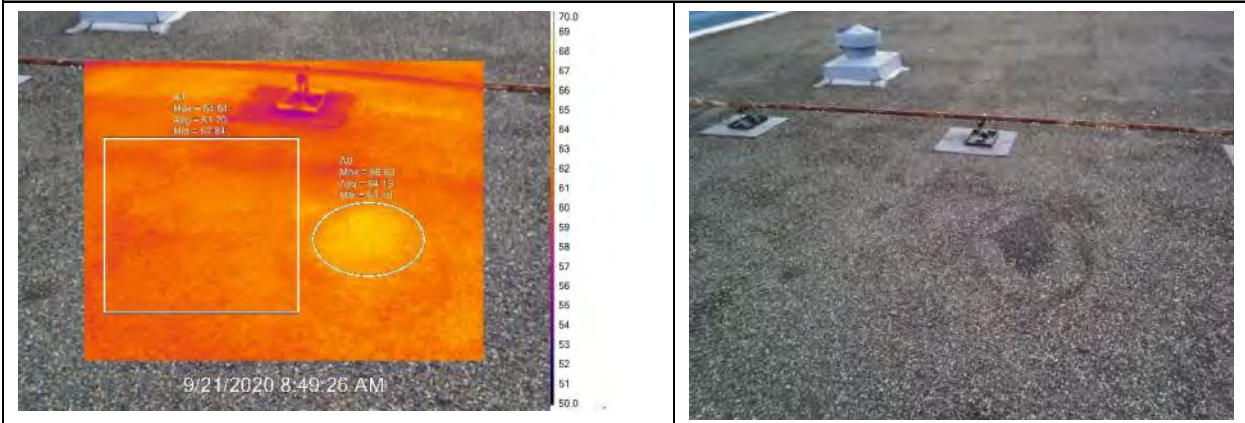


TABLE 0.3 GENERAL OVERVIEW

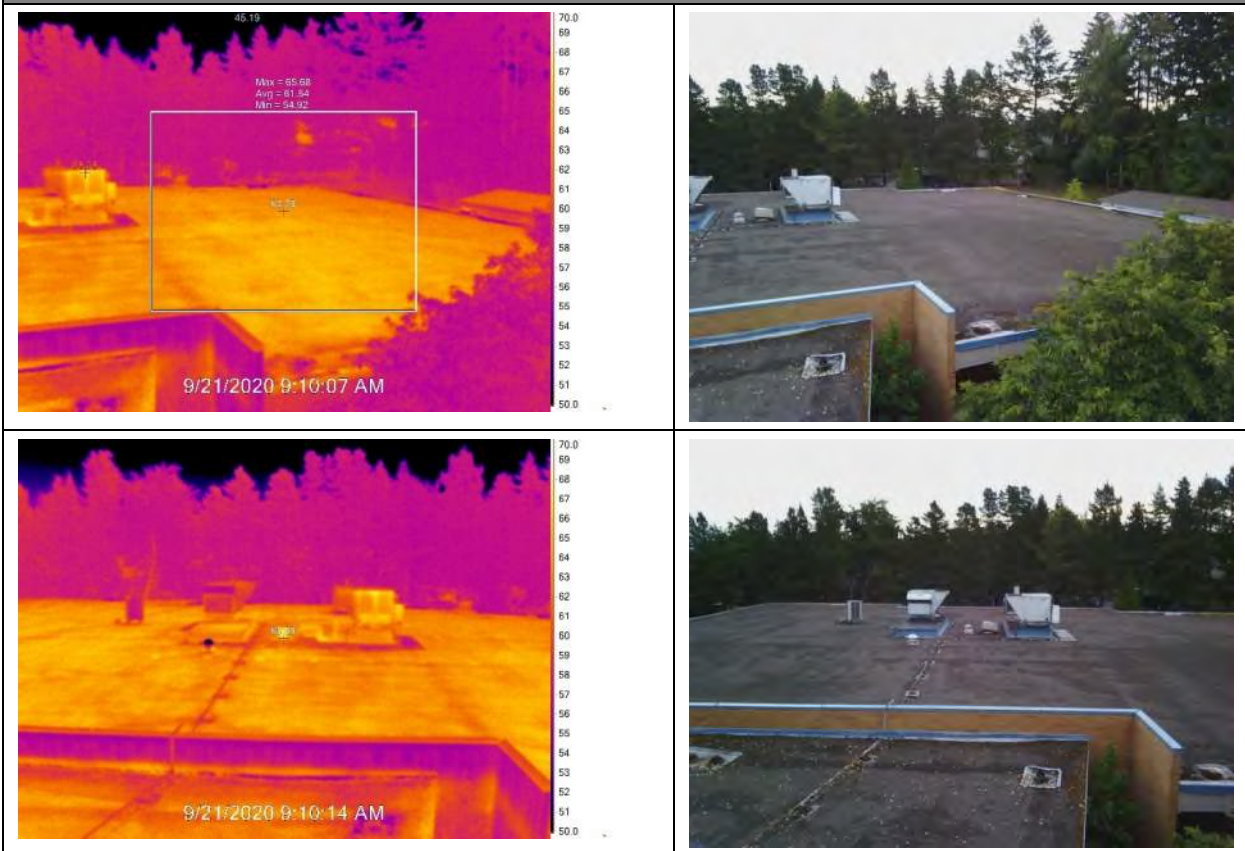


TABLE 0.3 GENERAL OVERVIEW

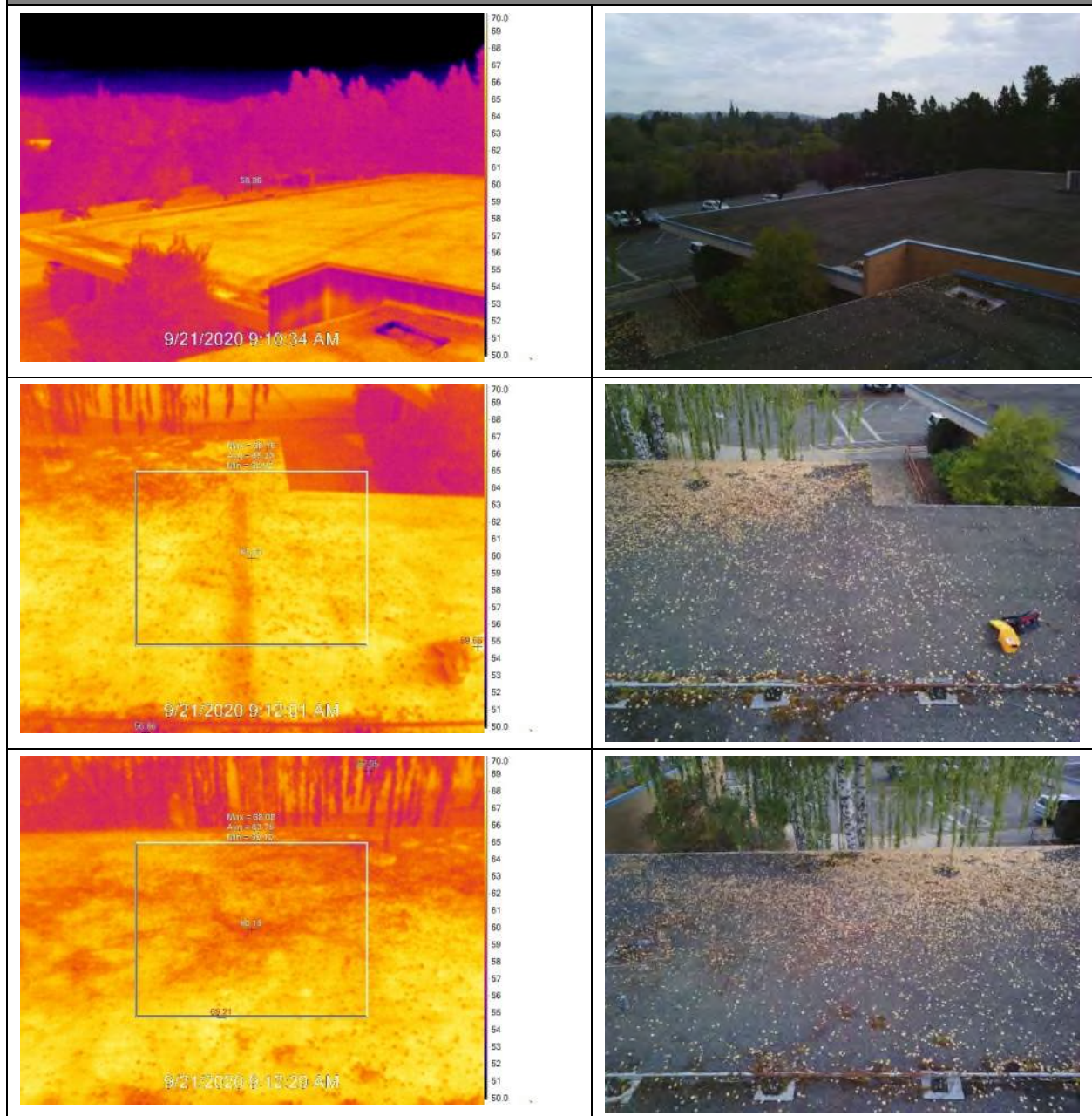




TABLE 0.3 GENERAL OVERVIEW

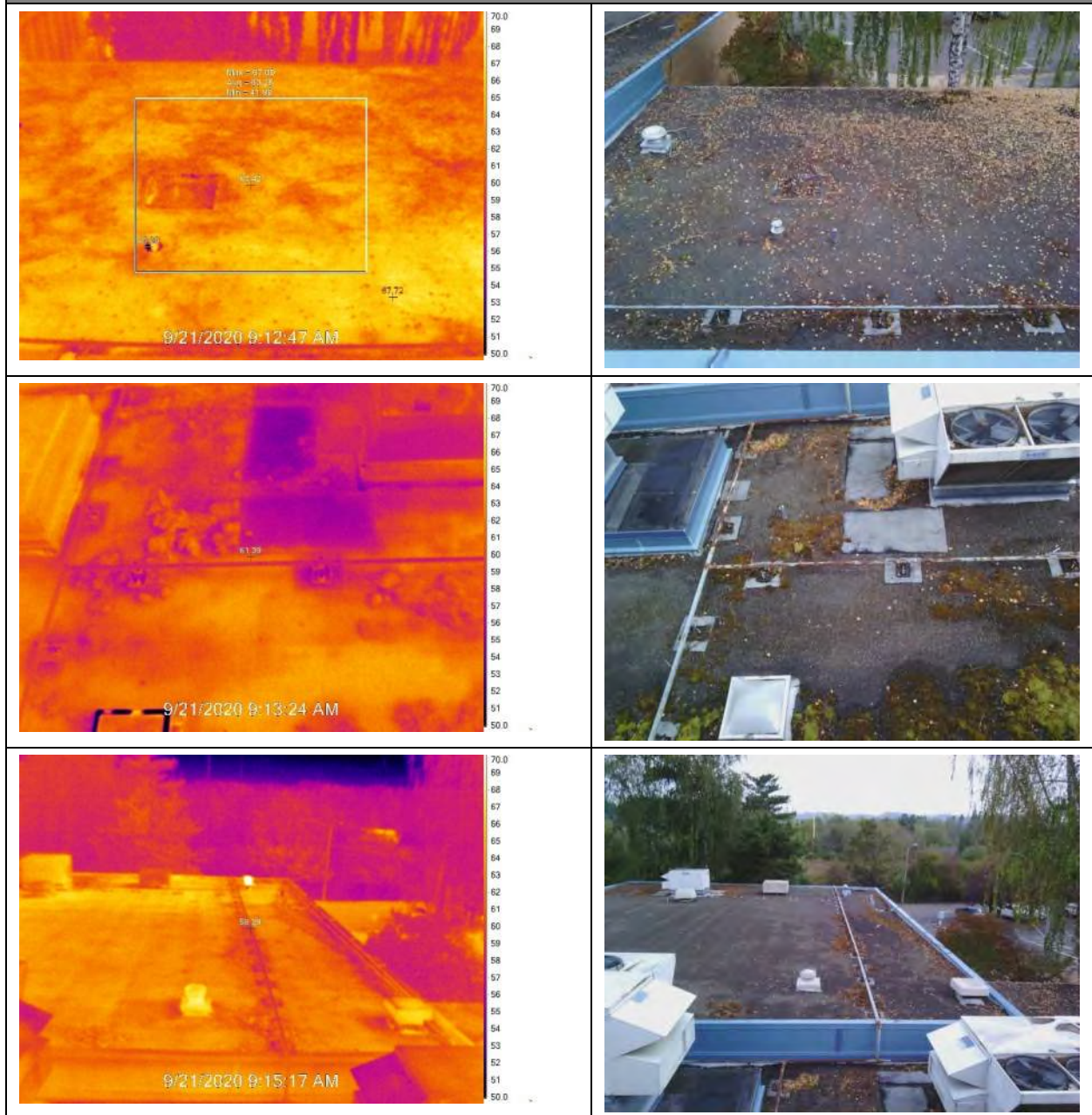
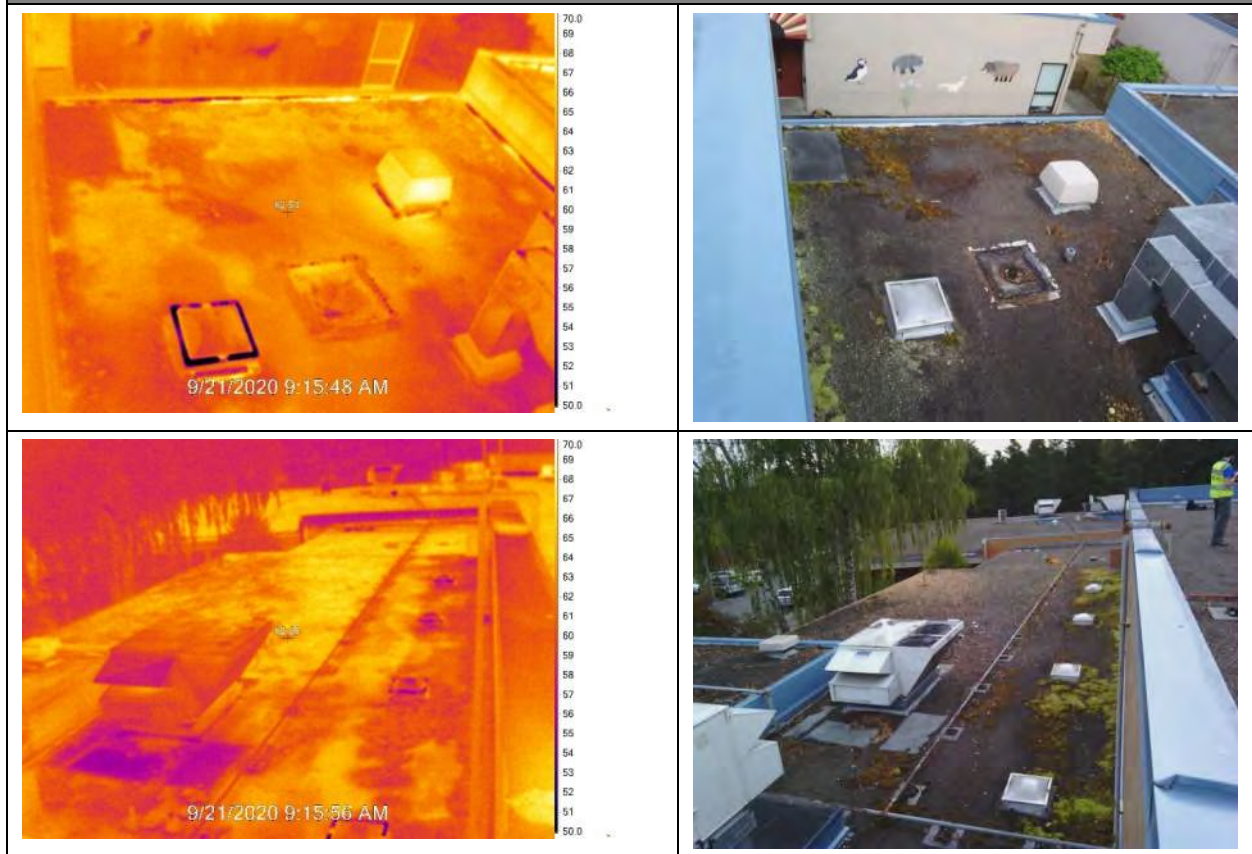


TABLE 0.3 GENERAL OVERVIEW



# Appendix D

Photos - Roof Cores



## Appendix D Roof Core Photos

### Core #1



*Figure D.1*

*Core #1 at center of east wing roof.*



*Figure D.2*

*Roof assembly*

*½" BUR asphaltic roof membrane*

*½" Fiberboard cover board*

*2" Paper-faced polyisocyanurate insulation (Polyiso)*



*Figure D.3*  
*Fiberboard cover board is dry.*



*Figure D.4*  
*Insulation and sheathing are dry.*





*Figure D.5*

*Moisture reading is conducted with a Tramex CMXpert II moisture meter with an insulated pin probe attachment.*



*Figure D.6*

*MC of 7.3% recorded at the plywood deck.*



## Core #2



*Figure D.7*

*Core #2 location at east edge of east wing roof.*



*Figure D.8*

*Core sample taken at Core #2 location.*



*Figure D.9*  
*Roof assembly*  
*½" BUR asphaltic roof*  
*membrane*  
*½" Fiberboard cover board*  
*2" Paper-faced*  
*polyisocyanurate insulation*  
*(Polyiso)*



*Figure D.10*  
*Paper facer of insulation is*  
*intact and dry.*





*Figure D.11*

*Insulation and plywood are dry and in good condition.*



*Figure D.12*

*MC of 10.6% recorded at the plywood deck.*

### Core #3



*Figure D.13*

*Core #3 location at suspected area of leak as identified via impedance scanning.*



*Figure D.14*

*Fiberboard and polyiso insulation are wet and deteriorated.*





*Figure D.15*

*Moisture detected in fiberboard using water reactive paper tape.*



*Figure D.16*

*Moisture present on surface of plywood deck. Plywood is in good condition.*



Figure D.17  
MC of 16.2% recorded at  
plywood deck.